Oct. 27, 1953 V. E. MATTSON, JR 2,656,673

ALARM FOR WRIST WATCHES

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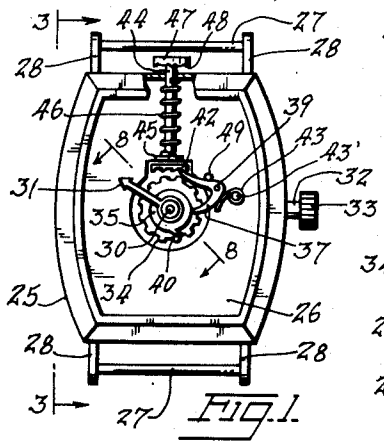


Fig. 1.

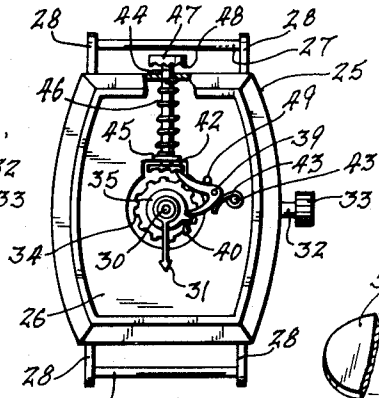


Fig. 2.

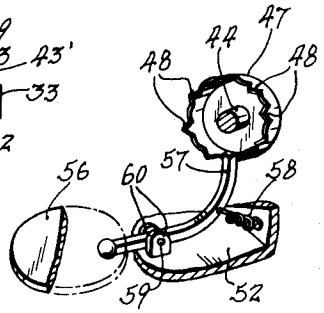


Fig. 7.

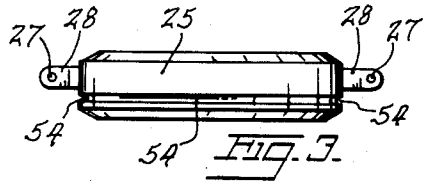


Fig. 3.

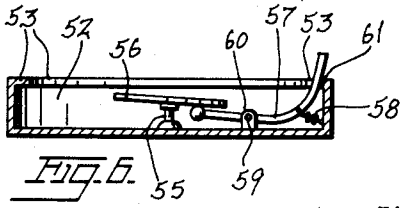


Fig. 6.

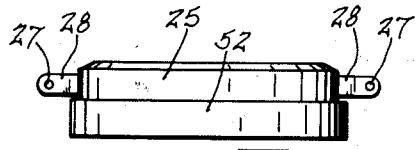


Fig. 4.

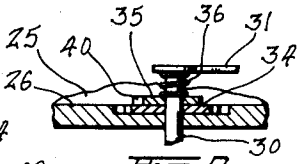


Fig. 8.

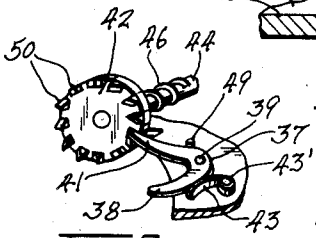


Fig. 9.

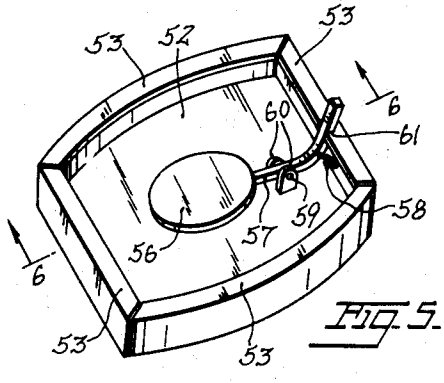


Fig. 5.

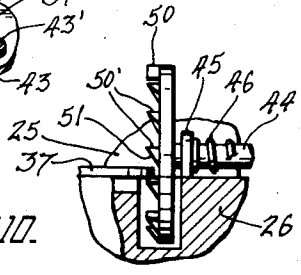


Fig. 10.

INVENTOR.
VICTOR EMMANUEL MATTSON, JR.
BY Zoltan A. Polachek
ATTORNEY

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ALARM FOR WRIST WATCHES

Victor Emmanuel Mattson, Jr., Brooklyn, N. Y.

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7 Claims. (Cl. 58—57.5)

1

This invention relates to wrist watches and more particularly to a wrist watch having a detachable alarm for awakening a sleeper or calling attention to appointments or for other purposes of alarms.

One object of the invention is to construct and arrange the watch of the invention so that the alarm actuating mechanism is integral with the watch whereas the alarm itself is contained within a separate casing readily attachable to or detachable from the watch.

Another object of the invention is to construct and arrange the several components of the invention so that all of the alarm actuating mechanism save a combined winding crown and actuator wheel are contained within the casing of the watch.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a front face view, partly in section, of a wrist watch constructed in accordance with the invention, the crystal, dial and minute hand having been removed in order to more clearly show certain parts.

Fig. 2 is a similar view but with certain parts in different positions of adjustment.

Fig. 3 is a side elevation of the watch looking in the direction of the arrows 3—3 of Fig. 1.

Fig. 4 is a view similar to Fig. 3 but with the alarm device attached to the watch.

Fig. 5 is a perspective view of the detachable alarm device.

Fig. 6 is a sectional view on line 6—6 of Fig. 5.

Fig. 7 is an isolated perspective view of the alarm device and its actuator.

Fig. 8 is a sectional view on line 8—8 of Fig. 1.

Fig. 9 is a perspective view of the control means for the alarm actuator.

Fig. 10 is a fragmentary view of a certain ratchet wheel and pawl.

In the instance of the invention illustrated in the drawings there is shown a wrist watch comprising a metallic casing 25 (Figs. 1 and 2) within which there is mounted the ordinary watch movement 26 not detailed herein. The casing is provided with the usual strap receiving pins 27 mounted in lugs 28 formed on the casing. Projecting upwardly from the watch movement 26 is the customary hour hand spindle 30 having an

2

hour hand 31 thereon, said spindle being connected with the wind and set stem 32 and with the crown 33. This connection may be of the usual standard construction, and, as it forms no part of the invention is not illustrated.

Secured on the hour hand spindle 30 beneath the hand 31 is a gear wheel 34 (Figs. 1 and 2), thus also gear wheel 34 being fixed to spindle 30 is connected with the stem 32 so as to be rotated with the spindle when the stem is rotated to set the watch.

Loosely mounted on spindle 30 is a cam disc 35 (Figs. 1 and 2) held in frictional contact with gear wheel 34 by a spring 36 coiled about the spindle 30 (see also Fig. 8) and contacting the cam disc 35 and the hub of the hour hand.

The construction is such that normally the cam disc is rotated with the gear wheel 34 but can be held against rotative movements for a purpose and by a means about to be described.

Pivoted at 39 to the face of movement 26 is a bell crank lever 37 (Figs. 1 and 2) having one end formed as at 38 (Fig. 9) to cooperate with the hump 40 of cam disc 35 and the other end formed into a pawl arm or point 41 to cooperate with the teeth of a ratchet wheel 42 to be more fully described hereinafter. A leaf spring 43 fixed at 43' to movement 26 acts to hold end 38 in contact with cam 35 and pawl point 41 in engagement with the teeth of ratchet wheel 42 but spaced from the ratchet wheel. The hump 40 of cam disc 35 is provided on the one side with an abrupt rise such that if the disc be rotated counterclockwise until the hump comes into contact with end 38 of lever 37, said end will prevent further rotative movement of the disc, overcoming the force of spring 36 and permitting shaft 30 to move without disc 35 following. In this operation the bell crank lever 37 limits against a stud 49 to prevent the pawl point 41 from being forced out of alignment with the teeth of ratchet wheel 42. The other side of hump 40 is provided with an inclined rise to rock the bell crank and disengage the pawl arm or point 41 from the teeth of the ratchet wheel 42.

The ratchet wheel 42 is secured on the end of a spindle 44 journalled in a hole in the end of casing 25 and in a block 45. A spring 46 is coiled about spindle 44 and has one end secured to the spindle and the other to the casing 25. The outer end of spindle 44 carries between casing 25 and pin 27, a crown gear 47 whose pointed teeth 48 (Fig. 7) project inward toward the casing 25.

The ratchet wheel 42 (Figs. 9 and 10) has ratchet teeth 50 which are formed to present on

the one side an abrupt stop 50' and on the other side a cam surface 51 inclined downward toward and with respect to the pawl point 41 of bell crank lever 37 to force the pawl arm or point 41 away from the ratchet wheel 42 when the crown gear 47 is wound in a counterclockwise direction, leaf spring 43 being resilient enough to permit such movement.

The construction is such that spindle 44 can be rotated by hand through the medium of crown gear 47, the ratchet teeth 50 of the ratchet wheel clicking or passing over the pawl point 41 of lever 37, which point is cammed out of engagement with the ratchet teeth by the cam surfaces 51 as described. As the spindle is rotated counter-clockwise by crown gear 47, tension is stored up in spring 46, but reverse rotation of spindle 44 is prevented by the pawl point 41 engaging the abrupt stop face of a ratchet tooth 50 of ratchet wheel 42. When lever 37 is rocked by cam 35 and pawl point 41 disengaged from the ratchet wheel 42, spring 46 rotates spindle 44 and crown gear 47 in the opposite clockwise direction indicated by the curved directional arrow in Fig. 10.

According to the invention, the alarm portion of the watch is actuated by the crown gear 47 but is attachable to and removable from the watch, so that the watch can be worn without the alarm device (Fig. 3) or with the device (Fig. 4).

The alarm device is contained within a casing 52 (Figs. 5 and 6) having flexible, inturned flaps 53 to snap into grooves 54 provided in the casing 25 of the watch and secure casing 52 to casing 25. The two casings are detached from one another by prying the flaps 53 out of the grooves 54.

Within casing 51 there is mounted on a post 55 a sounding plate or gong 56 against which the rounded end of one arm of a bell crank 57 is tensioned by a spring 58 having one end secured to the bell crank and the other end to the casing 52. The bell crank 57 is pivoted on a pin 59 in a pair of blocks 60 secured in the casing 52, and has one arm thereof continued upward through a notch 61 in one of the flaps 53 in position to engage the crown gear 47 as shown in Fig. 7.

The construction is such that as the crown gear 47 is rotated as described above the pointed teeth 48 of said gear cam the upper arm of bell crank 57 inwardly pulling the rounded end of the other arm of said bell crank away from gong 56 against the tension of spring 58 which pulls the said rounded end forcibly in contact with said gong when the teeth of gear 47 free the upper arm of the bell crank. The forcible engagement of said rounded end with said gong produces a series of alarm notes or sounds.

In operation, let it be assumed, for example, that it is ten o'clock a. m., as shown by the position of the hour hand in Fig. 1, and it is desired to set the alarm for six o'clock p. m., in which time position the hour hand is shown in Fig. 2. The hands of the watch are turned backward by means of the setting crown 33, through a complete cycle from ten to ten assuring abutment of the hump 40 of cam disc 35 with the end 38 of lever 37 and then on to seven so that on resetting the hands to the proper time, the hump 40 will be moved away from the end 38 of lever 37 the proper distance for the alarm to go off at six o'clock.

As the gear 34 is rotated counterclockwise, the cam disc 35 is frictionally rotated therewith until the abrupt face of hump 40 comes into contact with the pawl end 38 of lever 37 which as shown in Fig. 2 prevents further rotation thereof. The extent to which the hour hand is moved clockwise after this occurs determines when the alarm will go off. The desired "over" distance counter-clockwise having been reached, the hands of the watch are then reset, clockwise, to ten, the hump 40 moving away from the pawl end 38 of lever 37, the appropriate angular distance.

As time passes the hour hand rotates clockwise, the cam disc 35 rotating with it, until as the hour hand reaches six, the inclined surface of hump 40 cams the bell crank 37 counterclockwise and disengages the pawl point 41 thereof from the ratchet wheel 42, allowing spindle 44 to rotate and ring the alarm as described above.

It is believed evident from the foregoing that the invention provides a detachable alarm for a watch, the only external portion of the alarm mechanism left with the watch when the alarm is removed being the crown gear 46 which is positioned between casing 25 and pin 27 and thus is not an objectionable appendage.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. In an alarm wrist watch the combination of a watch casing, an alarm casing, a peripheral groove in the watch casing, a plurality of flaps on the alarm casing to engage in said groove and detachably secure the casings together, alarm means mounted in the alarm casing, and alarm actuating means mounted in the watch casing.

2. In an alarm wrist watch the combination of a watch casing, an alarm casing, a peripheral groove in the watch casing, a plurality of flaps on the alarm casing to engage in said groove and detachably secure the casings together, alarm means mounted in the alarm casing, and alarm actuating means mounted in the watch casing, said alarm means including a gong, a bell crank clapper for said gong having one arm engaged with said actuating means, and a spring to draw the clapper into engagement with the gong.

3. In an alarm wrist watch the combination of a watch casing, an alarm casing, a peripheral groove in the watch casing, a plurality of flaps on the alarm casing to engage in said groove and detachably secure the casings together, alarm means mounted in the alarm casing, and alarm actuating means mounted in the watch casing, said alarm means including a gong, a bell crank clapper for said gong having one arm engaged with said actuating means, and a spring to draw the clapper into engagement with the gong; and said actuating means including a spindle projecting through the watch casing, a crown gear mounted on the outer end of said spindle and having pointed teeth projecting toward the casing, said bell crank arm engaging said teeth and being rocked thereby, a coil spring wound around said spindle and having its ends secured to the spindle and the watch casing, a ratchet wheel secured on said spindle, a second bell crank, one arm of which is a pawl to engage said ratchet wheel and prevent rota-

tion of said spindle by said spring, an hour hand spindle, and means controlled by said hour hand spindle to disengage said pawl from said ratchet wheel.

4. In an alarm wrist watch the combination of a watch casing, an alarm casing, a peripheral groove in the watch casing, a plurality of flaps on the alarm casing to engage in said groove and detachably secure the casings together, alarm means mounted in the alarm casing, and alarm actuating means mounted in the watch casing, said alarm means including a gong, a bell crank clapper for said gong having one arm engaged with said actuating means, and a spring to draw the clapper into engagement with the gong; and said actuating means including a spindle projecting through the watch casing, a crown gear mounted on the outer end of said spindle and having pointed teeth projecting toward the casing, said bell crank arm engaging said teeth and being rocked thereby, a coil spring wound around said spindle and having its ends secured to the spindle and the watch casing, a ratchet wheel secured on said spindle, a second bell crank, one arm of which is a pawl to engage said ratchet wheel and prevent rotation of said spindle by said spring, an hour hand spindle, a setting crown, means associated with said setting crown whereby said hour hand spindle can be rotated, a pinion rotatable with said hour hand spindle, a cam disc on said hour hand spindle in frictional engagement with said pinion to be rotated thereby, a spring to maintain such frictional engagement, and a hump on the periphery of said cam disc having an abrupt rise which by engagement with the other arm of said bell crank prevents rotation of said disc in one direction and an inclined rise to rock said bell crank and disengage the pawl arm thereof from said ratchet wheel when the disc rotates in the opposite direction.

5. In an alarm wrist watch the combination of a watch casing, an alarm casing, a peripheral groove in the watch casing, a plurality of flaps on the alarm casing to engage in said groove and detachably secure the casings together, alarm means mounted in the alarm casing, and alarm actuating means mounted in the watch casing, said alarm means including a gong, a bell crank clapper for said gong having one arm engaged with said actuating means, and a spring to draw the clapper into engagement with the gong; and said actuating means including a spindle projecting through the watch casing, a crown gear mounted on the outer end of said spindle and having pointed teeth projecting toward the casing, said bell crank arm engaging said teeth and being rocked thereby, a coil spring wound around said spindle and having its ends secured to the spindle and the watch casing, a ratchet wheel secured on said spindle, a second bell crank, one arm of which is a pawl to engage said ratchet wheel and prevent rotation of said spindle by said spring, a spring to hold said pawl in engagement with said ratchet wheel, a limit stop to prevent overthrow of the pawl past the ratchet wheel, an hour hand spindle, and means controlled by said hour hand spindle to disengage said pawl from said ratchet wheel.

6. In an alarm wrist watch the combination of a watch casing, an alarm casing, a peripheral groove in the watch casing, a plurality of flaps on the alarm casing to engage in said groove and detachably secure the casings together, alarm means mounted in the alarm casing, and alarm actuating means mounted in the watch casing, said alarm means including a gong, a bell crank clapper for said gong having one arm engaged with said actuating means, and a spring to draw the clapper into engagement with the gong; and said actuating means including a spindle projecting through the watch casing, a crown gear mounted on the outer end of said spindle and having pointed teeth projecting toward the casing, said bell crank arm engaging said teeth and being rocked thereby, a coil spring wound around said spindle and having its ends secured to the spindle and the watch casing, a ratchet wheel secured on said spindle, a second bell crank, one arm of which is a pawl to engage said ratchet wheel and prevent rotation of said spindle by said spring, a spring to hold said pawl in engagement with said ratchet wheel, a limit stop to prevent overthrow of the pawl past the ratchet wheel, an hour hand spindle, a setting crown, means associated with said setting crown whereby said hour hand spindle can be rotated, a pinion rotatable with said hour hand spindle, a cam disc on said hour hand spindle in frictional engagement with said pinion to be rotated thereby, a spring to maintain such frictional engagement, and a hump on the periphery of said cam disc having an abrupt rise which by engagement with the other arm of said bell crank prevents rotation of said disc in one direction and an inclined rise to rock said bell crank and disengage the pawl arm thereof from said ratchet wheel when the disc rotates in the opposite direction.

7. In an alarm wrist watch the combination of a watch casing, an alarm casing, a peripheral groove in the watch casing, a plurality of flaps on the alarm casing to engage in said groove and detachably secure the casings together, alarm means mounted in the alarm casing, and alarm actuating means mounted in the watch casing, a cutout in one of said flaps, said alarm means including a gong, a bell crank clapper for said gong having one arm projecting through said cutout and engaged with said actuating means, and a spring to draw the clapper into engagement with the gong; and said actuating means including a spindle projecting through the watch casing, a crown gear mounted on the outer end of said spindle and having pointed teeth projecting toward the casing, said bell crank arm engaging said teeth and being rocked thereby, a coil spring wound around said spindle and having its ends secured to the spindle and the watch casing, a ratchet wheel secured on said spindle, a second bell crank, one arm of which is a pawl to engage said ratchet wheel and prevent rotation of said spindle by said spring, an hour hand spindle, and means controlled by said hour hand spindle to disengage said pawl from said ratchet wheel.

VICTOR EMMANUEL MATTSON, JR.

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