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E. B. LAPHAM & J. WALKER.

ALARM CLOCK.

APPLICATION FILED SEPT. 25, 1907. RENEWED JUNE 3, 1908.

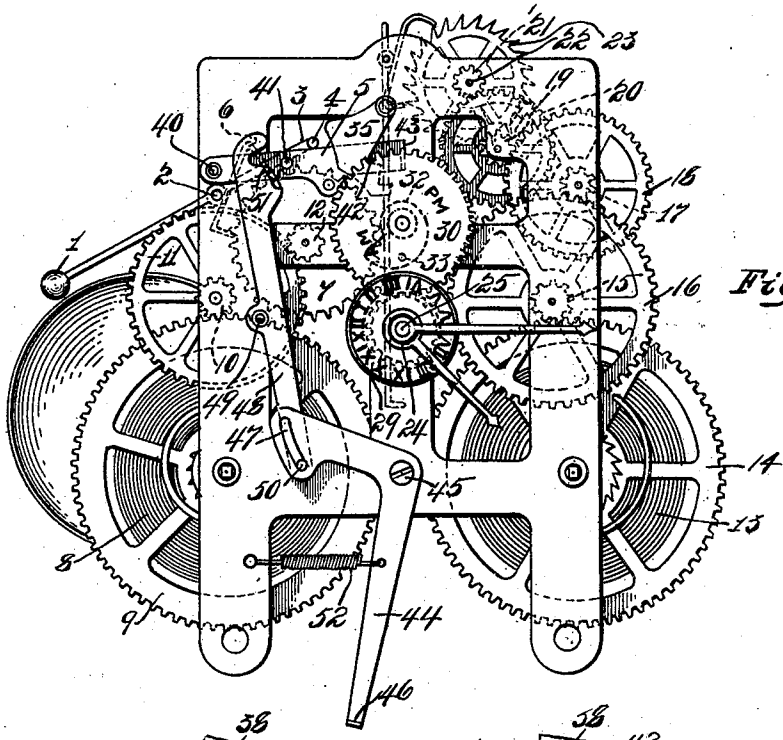


Fig. 1.

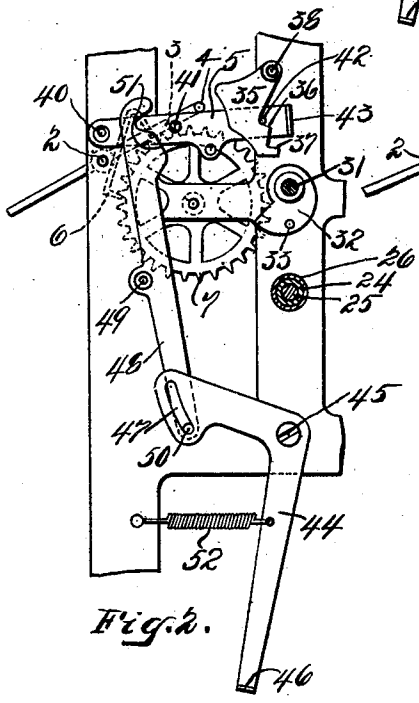


Fig. 2.

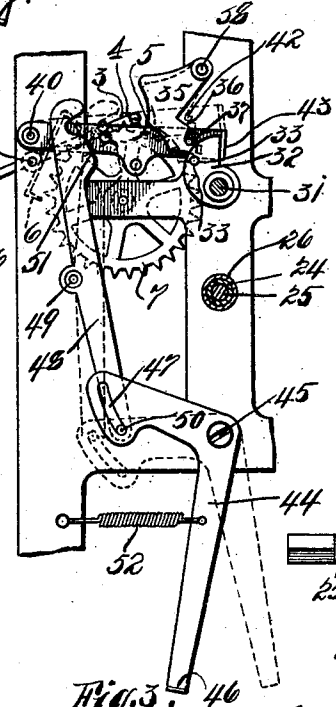


Fig. 3.

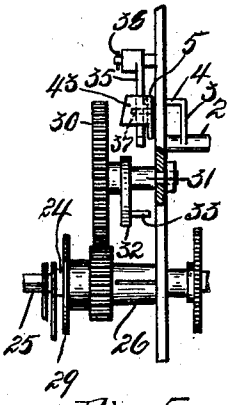


Fig. 4.

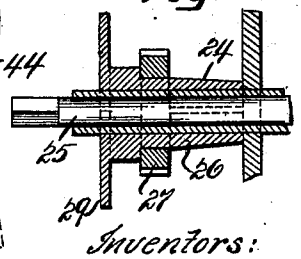


Fig. 5.

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UNITED STATES PATENT OFFICE.

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ALARM-CLOCK.

No. 896,734. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed September 25, 1907, Serial No. 394,434. Renewed June 3, 1908. Serial No. 436,470.

To all whom it may concern:

Be it known that we, EDWIN B. LAPHAM and JAMES WALKER, citizens of the United States, residing at New York city, New York, have invented certain new and useful Improvements in Alarm-Clocks, of which the following is a clear, full, and exact description.

Our invention relates to an alarm clock mechanism.

Alarm clocks have been constructed so that when the alarm goes off it will ring continuously, that is, for fifteen or twenty minutes for example, unless shut off by hand, but, if the person who shuts off the alarm forgets to reset the same, the alarm will not be given at the proper time the next morning, for example, and this fact has made such an alarm clock extremely unsatisfactory.

In carrying out our invention in the embodiment shown in the drawings, we have provided an eight-day clock movement with an alarm which will ring continuously for twenty minutes, for example, unless shut off, and have provided a hand-operated shut-off mechanism to arrest the alarm train and restore the holding mechanism to normal position, together with suitable means which will restore the hand-operated mechanism to its normal position automatically without the necessity of restoring the same by hand.

In the accompanying drawings which show the preferred form of our invention, Figure 1 is a front elevation of a clock mechanism provided with our invention; Fig. 2 is an enlarged view in elevation showing the mechanism of our invention in normal non-ringing condition; Fig. 3 is similar to Fig. 2 but showing the mechanism in ringing position in full lines, and in dotted lines the mechanism at the instant of resetting; Fig. 4 is a partial side elevation of Fig. 3, and Fig. 5 is a vertical section through the hour shaft on an enlarged scale.

The ringing train.—The hammer 1 is pivoted on the escapement shaft 2, and is provided with backwardly extending arm 3 bent at its end 4 so that the end 4 will normally rest against the holding lever 5 to prevent the escapement 6 from oscillating upon its shaft under the influence of the escapement wheel 7, which is operated from the spring motor 8 by gears 9, 10, 11 and 12 as is customary.

The clock mechanism.—The clock mechanism comprises a spring motor 13, gears 14, 15, 16, 17, 18, 19, 20, 21, the last of which operates the shaft 22 of the escapement wheel 23 as is usual. Through ordinary clock gearing not shown for the sake of clearness, the tubular hour shaft 24 and the shaft 25 for the minute hand are operated.

The setting mechanism.—On the tubular hour shaft 24 there is frictionally mounted a sleeve 26 carrying a gear 27 and a dial 29. The dial 29 is marked with hour divisions. The gear 27 meshes with a gear 30 of twice the diameter of the gear 27. The gear 30 is marked on one half "P. M." and on the other half "A. M." The gear 30 is rotatable on a stud 31 and carries with it a cam plate 32 provided with a pin 33. Consequently the position of the pin 33 can be changed relatively to hands of the clock by rotating the dial sleeve.

The holding means.—A latch 35 having steps 36 and 37 is freely pivoted to the frame at 38. A holding lever 5 pivoted at 40 carries a pin 41 in its mid position, a pin 42 near the latch 35 and a bent end 43 at its end diametrically over the cam plate 32. In locked or normal position the pin 42 rests on the step 36 of the latch 35 as shown in Fig. 2, and the holding lever 5 is held against the bent end 4 of the hammer lever 3. When the pin 33 on the cam plate 32 strikes the latch 35, the holding lever 5 falls and rests on the periphery of the cam plate 32 until such time as the precipitous side of the same passes the bent end 43 of the holding lever 5, when the hammer lever 3 and escapement 6 will be freed and the bell rung continuously.

The hand-operated resetting means.—Should one wish to stop the ringing bell, the following apparatus is brought into play. A bell crank lever 44 pivoted to the frame at 45 is formed with a finger piece 46 at one end and a slot 47 at the other end. A straight lever 48 pivoted at 49 is provided with a pin 50 on aforesaid slot and a cam edge 51 at its upper end. Upon throwing the bell crank lever 45 onto the position shown in dotted lines, Fig. 3, the cam surface 51 will engage the pin 41 on the holding lever 5, raise the lever and allow the latch 35 to fall into the position of the dotted lines and thus hold the hammer lever and escapement 6 and stop the alarm. A spring 52 returns the lever to normal position so that when next the pin 33 strikes the latch 35 the latch will free the holding lever

5 to allow it to be released by the cam 32. The dial 29 which forms means for adjusting the let-off cam 32 may be grasped by the fingers so as to rotate it and its sleeve upon the hour hand shaft 24 so as to bring any portion of said disk underneath the hour-hand, which will obviously rotate gears 27 and 30 and consequently cam 32. The numbered hour divisions on said dial constitute means for determining the adjustment of said cam 32. Said disk 29, sleeve and wheels 27 and 30 therefore constitute one form of a hand-operated setting means adjustable with relation to said clock movement and adapted to set the let-off cam 32 so that it will be ready to operate at any pre-determined time.

While we have described our invention particularly with reference to the embodiment shown in the drawings, it will be obvious that many variations may be made from that construction shown without departing from the spirit of our invention as claimed, and we therefore do not limit ourselves to the construction illustrated in the drawings.

What we claim is:

1. In combination a clock movement, an alarm mechanism, holding means normally preventing said alarm mechanism from operating, let-off means operated by said clock movement and adapted to release said holding means and allow said alarm mechanism to operate until said holding means is re-set by hand, hand-operated resetting means adapted to restore said holding means to normal position to stop said alarm mechanism, means to automatically restore said hand-operated re-setting means to normal position, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off means for operation at a predetermined time.

2. In combination a clock movement, an alarm mechanism, holding means normally preventing said alarm mechanism from operating, let-off means normally operated by said clock movement once in twenty-four hours and adapted to release said holding means and allow said alarm mechanism to operate until said holding means is re-set by hand, hand-operated re-setting means adapted to restore said holding means to normal position to stop said alarm mechanism, means to automatically restore said hand-operated re-setting means to normal position, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off means for operation at a predetermined time.

3. In combination a clock movement, an alarm mechanism, holding means normally preventing said alarm mechanism from operating, let-off means normally operated by said clock movement once in twenty-four hours and comprising a cam rotated by said clock movement and adapted to release said holding means and allow said alarm mechanism to operate until said holding means is re-set by hand, hand-operated re-setting means adapted to restore said holding means to normal position to stop said alarm mechanism, means to automatically restore said hand-operated re-setting means to normal position, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off means for operation at a predetermined time.

4. In combination a clock movement, an alarm mechanism independent of said clock movement, holding means normally preventing said alarm mechanism from operating, let-off means operated by said clock movement and adapted to release said holding means and allow said alarm mechanism to operate until said holding means is re-set by hand, hand-operated re-setting means adapted to restore said holding means to normal position to stop said alarm mechanism, means to automatically restore said hand-operated re-setting means to normal position, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off means for operation at a predetermined time.

5. In combination a clock movement, an alarm mechanism, holding means normally preventing said alarm mechanism from operating, said holding means comprising a movable part and a latch normally holding said movable part in position, a let-off device moved by said clock movement, means operated by said clock movement and adapted to move said latch and release said movable portion of said holding means and allow the same to move to and rest on said let-off device without releasing said alarm, said let-off device being adapted to afterwards fully release said movable portion to allow the alarm mechanism to operate until said movable portion is restored to normal position, means to restore said holding means to normal position, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off device for operation at a predetermined time.

6. In combination a clock movement, an alarm mechanism, holding means normally preventing said alarm mechanism from operating, said holding means comprising a movable part and a latch normally holding said movable part in position, a let-off device moved by said clock movement, means operated by said clock movement and adapted to move said latch and release said movable portion of said holding means and allow the same to move to and rest on said let-off device without releasing said alarm, said let-off device being adapted to afterwards fully release said movable portion to allow the alarm mechanism to operate until said mov-

able portion is restored to normal position, hand-operated means to restore said holding means to normal position, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off device for operation at a predetermined time.

7. In combination a clock movement, an alarm mechanism operable independently of said clock movement, holding means normally preventing said alarm mechanism from operating and comprising a movable lever and a latch adapted to hold said lever in alarm locking position, means operated by said clock movement and adapted to move said latch and allow said lever to move to and rest upon a twenty-four hour cam without releasing said alarm mechanism, said cam being moved by said clock movement and adapted to fully release said lever thereafter to release said alarm mechanism, a hand-operated stop lever and mechanism operated thereby for restoring said first lever and latch to normal position to stop said alarm, and a spring to restore said stop lever to normal position when released, and hand-operated means adapted to set said let-off cam for operation at a predetermined time.

8. In combination a clock movement, an alarm mechanism, holding means normally preventing said alarm mechanism from operating, let-off means operated by said clock movement and adapted to release said holding means and allow said alarm mechanism to operate until said holding means is reset, hand-operated resetting means adapted to engage said holding means for restoring the same to normal condition to stop said alarm mechanism, means to automatically restore said hand-operated resetting means to normal position, thereby withdrawing the same from said holding means, means for retaining said holding means in normal position upon the withdrawal of said resetting means, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off device for operation at a predetermined time.

9. In combination, a clock movement, an alarm mechanism, holding means for normally preventing the operation of said alarm, a let-off device actuated by said clock movement to release said holding means once in 24 hours and allow said alarm to operate until said holding means is reset, hand-operated resetting means to restore said holding means to normal position to stop said alarm and simultaneously place said holding means in condition to be again released by said let-off device, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off device for operation at a predetermined time.

10. In combination, a clock movement, an alarm mechanism, holding means for normally preventing the operation of said alarm, a let-off device actuated by said clock movement to periodically release said holding means once in 24 hours, and allow said alarm to operate until said holding means is reset by hand, hand-operated resetting means adapted to restore said holding means to normal position, thereby stopping said alarm, said resetting means being normally out of engagement with said holding means except when restoring the same to normal position, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off means for operation at a predetermined time.

11. In combination, a clock movement, an alarm mechanism, holding means for normally preventing the operation of said alarm, a let-off device actuated by said clock movement to periodically release said holding means and allow said alarm to operate until said holding means is reset by hand, hand-operated resetting means adapted to engage said holding means and reset the same to normal position, thereby stopping said alarm and means for automatically disengaging said resetting means from said holding means before the next periodic operation of the let-off device, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off means for operation at a predetermined time.

12. In combination, a clock movement, an alarm mechanism, a holding means comprising a movable part and a latch normally engaging said movable part to hold the same in normal position, a let-off device operated by said clock movement to periodically release said holding means and allow said alarm to operate until said holding means is reset by hand, hand-operated means to reset said holding means to normal position, thereby stopping said alarm, and hand-operated setting means adjustable with relation to said clock movement and adapted to set said let-off device for operation at a predetermined time.

13. In combination a clock movement for operating the hour and minute hands of a clock, an alarm mechanism, holding means for normally preventing said alarm mechanism from operating, a let-off device normally releasing said holding means once in 24 hours to allow said alarm mechanism to operate until said holding means is reset by hand, said let-off device being adjustably connected to said clock movement, hand-operated means for adjusting said let-off device to release said holding means at any predetermined time during said 24 hours, and means for determining such adjustment and hand-operated resetting means adapted to restore said holding means to normal position and thereby stop said alarm.

14. In combination a clock movement for

operating the hour and minute hands of a clock, an alarm mechanism, holding means for normally preventing said alarm mechanism from operating and having a stationary location relative to said clock movement, a let-off device normally releasing said holding means once in 24 hours to allow said alarm mechanism to operate until said holding means is reset by hand, said let-off device being adjustably connected to said clock movement, hand-operated means for adjusting said let-off device to release said holding means at any predetermined time during said 24 hours, and means for determining such adjustment comprising a 12 hour dial connected to said let-off device and mounted adjacent said hour hand to be adjusted relative thereto, hand-operated resetting means adapted to restore said holding means to normal position and thereby stop said alarm.

Signed at New York, N. Y. this 24 day of September 1907.

EDWIN B. LAPHAM.
JAMES WALKER.

Witnesses:
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