E. B. LAPHAM & J. WALKER.

ALARM CLOCK.

APPLICATION FILED FEB. 25, 1909.

919,892.

Patented Apr. 27, 1909.

2 SHEETS—SHEET 1.

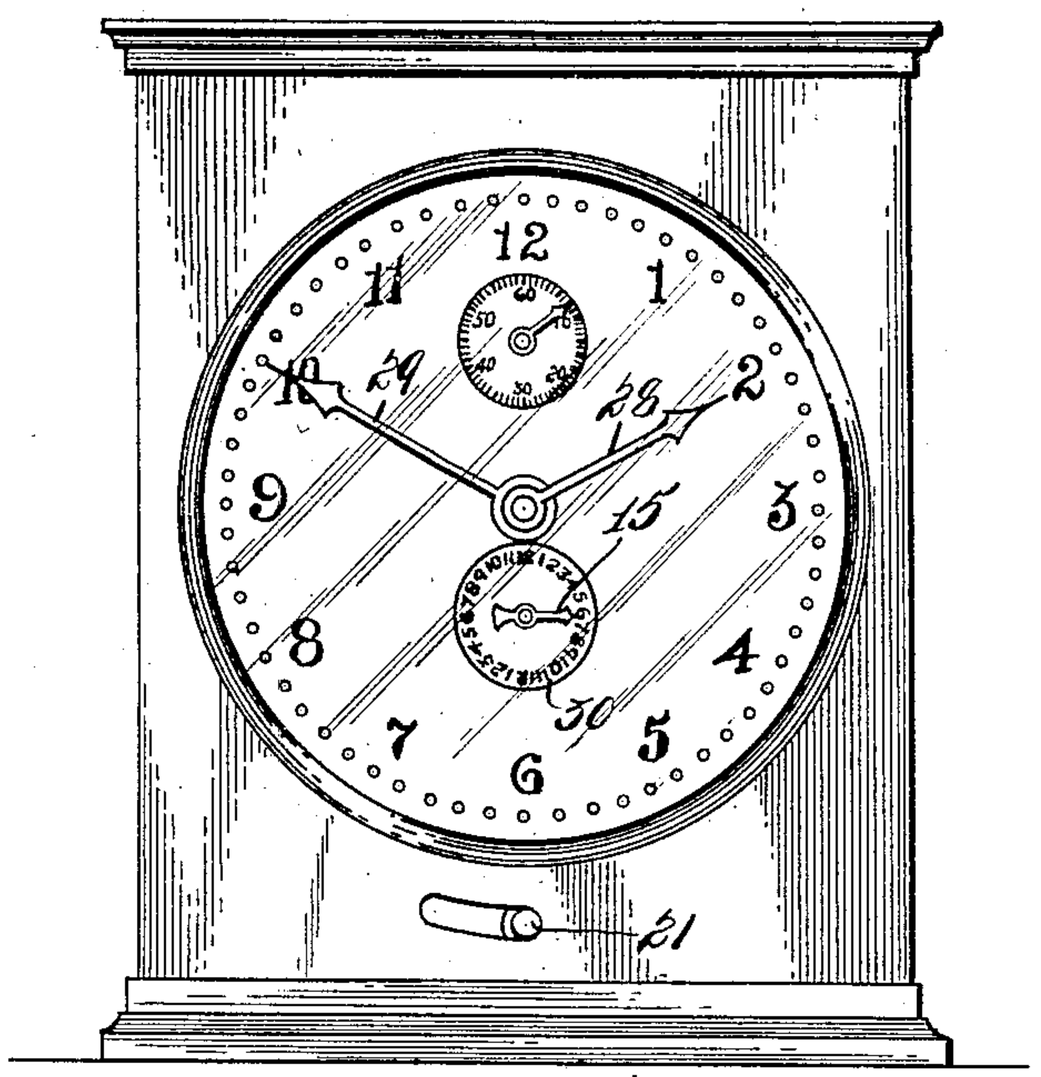

Fig. 1.

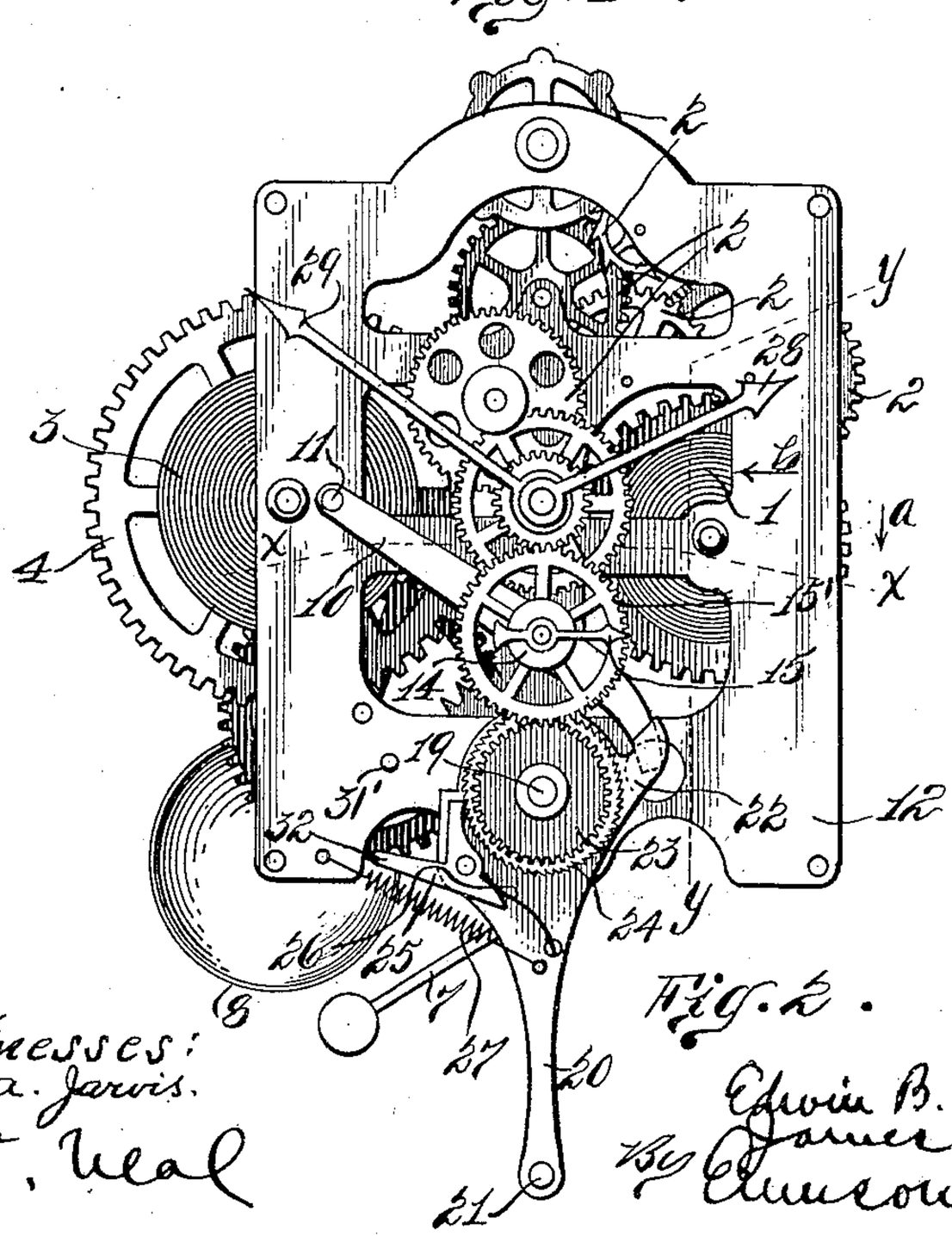

Fig. 2.

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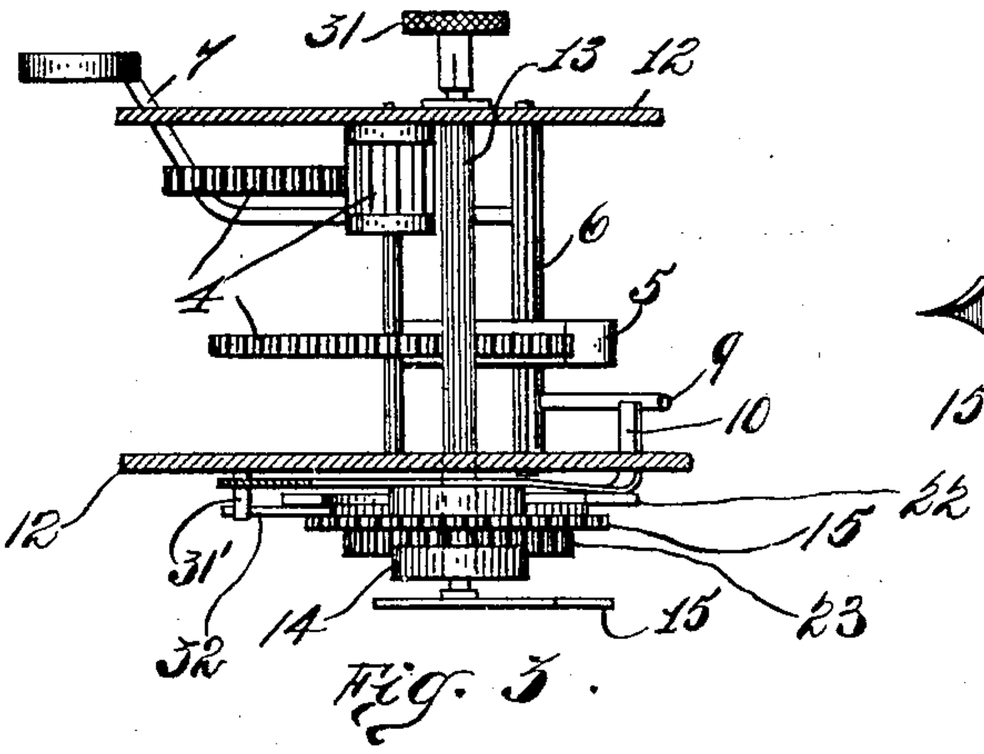
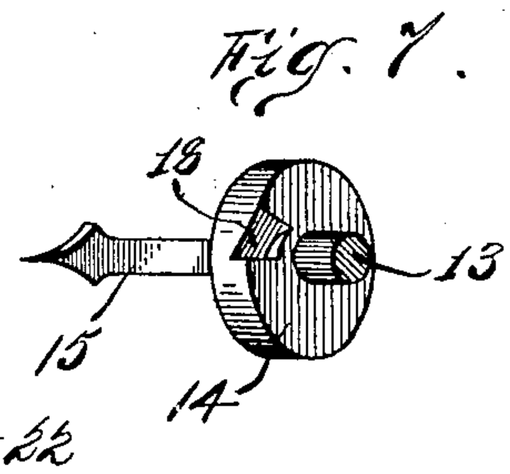


Fig. 3.

Fig. 7.



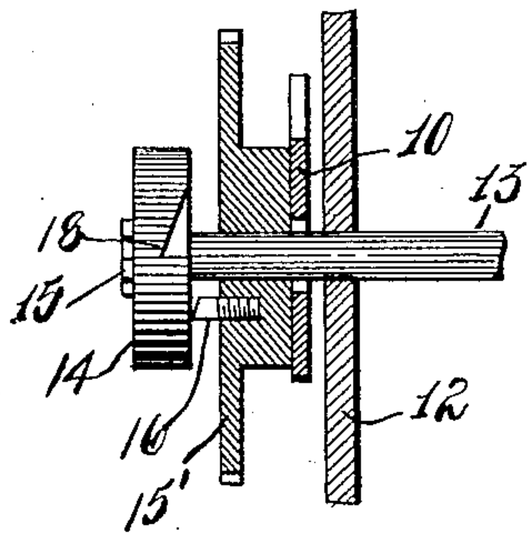
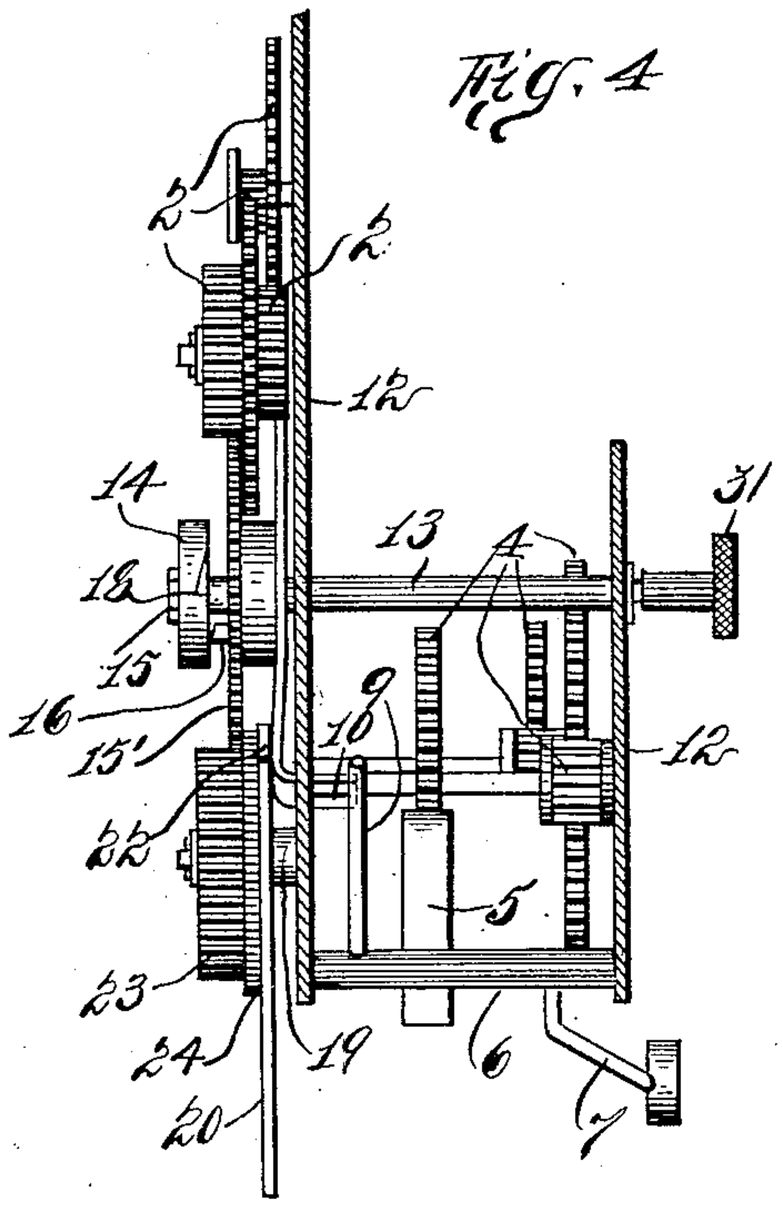


Fig. 6.

Fig. 4



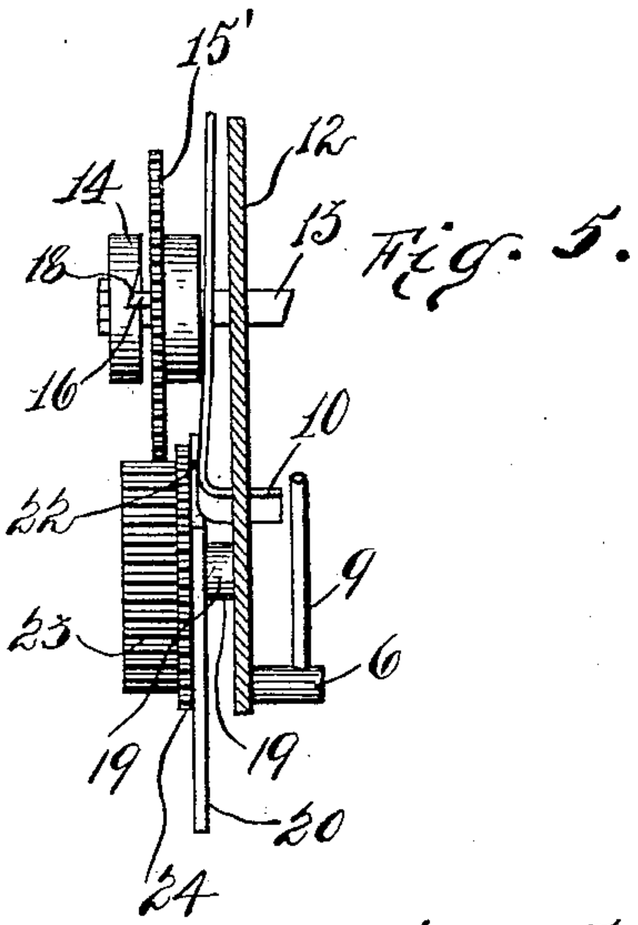


Fig. 5.

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UNITED STATES PATENT OFFICE.

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ALARM-CLOCK.

No. 919,892. Specification of Letters Patent. Patented April 27, 1909.

Application filed February 25, 1909. Serial No. 480,047.

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 improvement in alarm clocks of the same general character as that described and claimed in a previous patent of ours dated August 25, 1908, Number 896,734.

The object of the present improvement is to provide an alarm mechanism operated once in 24 hours with a shutting off mechanism which will not permanently lock the alarm stopping device in its shut-off position but which will enable the operator to shut off the alarm at each particular occasion required and yet permit the alarm to again operate 24 hours later without any further attention. The alarm mechanism of a clock of this character must necessarily be of the continuous type, that is, a mechanism which will cause the alarm to ring from 30 to 40 minutes at a time unless shut off.

Our invention will be defined in the claims.

In the drawings which disclose the preferred embodiment of our invention, Figure 1 represents a front view of the entire alarm clock showing the alarm setting dial; Fig. 2 is a front elevation of the entire clock movement and alarm mechanism; Fig. 3 is a fragmentary section along line *x*—*x* of Fig. 2 looking in the direction of the arrow *a*; Fig. 4 is a fragmentary section along *y*—*y* of Fig. 2 looking in the direction of arrow *b* and showing the connection of the tripping mechanism to the clock train; Fig. 5 is an enlarged detached sectional view along line Y—Y Fig. 2 showing the tripping means and stopping device; Fig. 6 is a detached fragmentary view of the tripping means; and Fig. 7 is a detached perspective view of the let-off cam.

The clock movement of our alarm clock is of the usual type and needs no particular description.

In the preferred embodiment of our invention as shown in the drawings, we have represented the supporting frame by 12 and the main-spring of the clock movement by 1, while 2 indicates the train of gearing therefrom to the hour and minute hands 28 and 29.

3 is the main spring of the alarm mechanism and said mechanism comprises a train of gearing 4 and a double ended vibrating pawl of the usual kind which is oscillated by its engagement with a fast running toothed wheel of the alarm train. This pawl is mounted on a rocking shaft 6 which also carries the bell hammer 7 for striking the alarm bell 8 (see Figs. 2, 3 and 4).

The preferred construction here illustrated is the common alarm mechanism found in nearly all modern day alarm clocks, and we have preferably shown our improvement in combination with such a mechanism, although it will be apparent that our improvement is equally well adapted to other forms of alarm mechanisms.

As shown in Figs. 3 and 4, the bell hammer rocking shaft 6 carries fast thereto an arm 9, and normally extending into the path of movement of this arm is a stopping device 10. The stopping device may be of any usual construction, but we prefer to use a flat spring member attached to the supporting frame 12 at 11 (see Fig. 2). As shown in Figs. 3 and 4, the outer end of this spring member 10 may be turned inwardly to come into the path of the arm 9 and thereby hold it and the hammer 7 from vibrating.

Our preferred means for supporting the tripping means consists of an adjustable setting shaft 13 which is supported in bearings on the main frame 12 and passes through the spring member 10, as shown in Figs. 4, 5 and 6. This shaft 13 is normally stationary and may have fixed to its rear end at the back of the clock a knurled finger piece 31 for adjusting the same. Preferably at the front end of this shaft 13 is fixedly secured a let-off cam 14 having a notch 18 therein and an indicating pointer 15 adjacent thereto for indicating its adjustment. A 24-hour dial 30 on the outer face of the clock enables the operator to set the hand 15 and let-off cam 14 at the desired hour for releasing the alarm. Referring to Fig. 6 it will be seen that behind this let-off cam 14 and mounted to turn loosely on shaft 13 is a movable portion or pinion 15′ which meshes with and is operated from the clock train 2. This stationary let-off cam 14 and the movable member 15 con-

stitute the preferred form of our tripping means for the stopping device since they coöperate in releasing said stopping device from the alarm and thereby allow said alarm to operate.

The spring member or stopping device 10 tends to carry the bent end portion out of engagement with arm 9, but the pinion 15′ which rests against this spring member, normally holds it in its stopping position as shown in Fig. 4. A pin 16 is carried on the pinion 15 and as the same is rotated by the clock movement, this pin 16 travels around the face of the cam until it reaches notch 18. It will be observed from Fig. 2 that pinion 15′ has twice the number of teeth as the hour hand wheel with which it meshes, and therefore rotates only once in 24 hours. As the pin 16 drops into notch 18 of the cam 14, the spring member 10 is permitted to move out of engagement with arm 9, as shown in Fig. 5, and thereby allow the alarm mechanism to operate. The pinion 15 may slide longitudinally on shaft 13 as well as rotate thereon. Preferably below the shaft 13 and attached to the main frame 12 is a bearing stud 19, and supported on this stud are the devices for shutting off the alarm by hand after it has been automatically released by the clock movement. An engaging member 20 is loosely mounted on this bearing stud 19, and said engaging member if desired may consist of a lever having a handle portion 21 and a portion 22 for engaging the lower end of the stopping device 10. As the lower end or handle 21 of this lever 20 is moved to the right viewing Fig. 2, the portion 22 will ride over upper face of the stopping device 10 and by a cam-like action will force the same rearwardly into the path of arm 9 as shown in Fig. 2. Also on this bearing stud 19 and in front of lever 20 we have preferably mounted a rotatable pinion 23 in mesh with pinion 15 and operated thereby from the clock movement. Fast to this pinion and adjacent to lever 20 is preferably fixed a toothed ratchet wheel 24, and coöperating therewith for locking engagement is a pawl 25 carried on lever 20 (see Fig. 2). A light spring 26 may be provided as shown to act on an arm of said pawl 25 to keep its nose pressed against ratchet 24.

We prefer to connect a coil spring 27 to the main frame and also to lever 20 to move said lever toward the left, looking at Fig. 2. It will be observed from this same figure that the teeth of ratchet 24 are so inclined and the pawl 25 is so mounted that when lever 20 is moved by the operator to the right the nose of the pawl runs idly over the teeth of ratchet 24 but immediately locks in engagement therewith when released to the force of spring 27. As soon as the lever 20 is released and locked by means of pawl 25 to ratchet 24, its return movement to the left is delayed or controlled by the movement of the ratchet 24 which, as before stated, is operated from the clock movement. A pin 31′ is preferably fixed to the main frame 12 in the path of an extension 32 of said pawl 25 to release said pawl and lever 25 from the ratchet 24 when the lever 20 has moved a sufficient distance to the left.

Briefly the operation of our improvement is as follows. In order to set the alarm releasing mechanism for operation at any predetermined time in the 24 hours, the hand 15 and adjacent notch 18 of the let-off cam is turned to the desired hour on dial 30 by means of finger piece 31. The pinion 15′ will be operated by the clock movement to carry pin 16 around the face of cam 24, as shown in Fig. 4, until it drops into the notch 18 as shown in Fig. 5. The alarm is then released as above described, and would ordinarily continue ringing until further rotation of pinion 15′ carried the pin 16 away from notch 18 if it were not for the hand-operated stopping means which we have provided. When the operator wishes to stop the alarm he throws the lever 20 toward the right to cause the portion 22 of said lever to act on the stopping member 10 and force it into the path of arm 9 as shown in Fig. 4. When the lever 20 is released in its right-hand position, the spring 27 would immediately return it to its left-hand position and out of engagement with the stopping member 10 if it were not for the locking engagement of the pawl 25 with ratchet 24. The lever 20 therefore being locked with ratchet 24, returns to its left-hand position slowly, being controlled by the clock movement. This slow return movement of the lever 20 enables the cam 14 to carry its notch 18 away from pin 16 and hold down the stopping device 10 before the portion 22 of the lever 20 is out of engagement therewith. The lever 20 moves to the left in engagement with ratchet 24 until the extension 32 of pawl 25 contacts with pin 31′ and releases the pawl from the ratchet. It will be observed that after the lever 20 is in its left-hand position the stopping device is again in readiness to be released by the next actuation of the tripping means. This, therefore, provides a construction by which the stopping device may be locked by hand in its shut-off position and then automatically unlocked by the continued rotation of the clock movement.

We claim:

1. In combination a clock movement, an alarm mechanism, a stopping device for normally preventing the operation of said alarm, tripping means actuated by said clock movement adapted to release said stopping device and allow said alarm to operate until said stopping device is returned to its normal position, an engaging member moved by hand to replace and hold said stopping device

in its normal position, and means controlled by the clock movement for automatically disengaging said hand moved member from the stopping device before the next actuation of the tripping means.

2. In combination a clock movement, an alarm mechanism, a stopping device for normally preventing the operation of said alarm, tripping means adapted to hold said stopping device in normal position and operated by said clock movement to periodically release the same and allow said alarm to operate until said stopping device is returned to normal position, an engaging member moved by hand to replace and hold said stopping device in its normal position and means controlled by the clock movement for automatically disengaging said hand moved member from the stopping device as soon as the tripping means is operated by the clock movement to again hold said stopping device in normal position.

3. In combination a clock movement, an alarm mechanism, a stopping device for normally preventing the operation of said alarm, tripping means actuated by said clock movement once in 24 hours adapted to release said stopping device and allow said alarm to operate until said stopping device is returned to its normal position, an engaging member moved by hand to replace and hold said stopping device in its normal position, and means controlled by the clock movement for automatically disengaging said hand moved member from the stopping device before the next actuation of the tripping means, and means for adjusting said tripping means to release said stopping means at any predetermined time.

4. In combination a clock movement, an alarm mechanism, a stopping device for normally preventing the operation of said alarm, tripping means adapted to hold said stopping device in normal position and operated by said clock movement to periodically release the same and allow said alarm to operate until said stopping device is returned to normal position, an engaging member moved by hand to replace and hold said stopping device in its normal position and means controlled by the clock movement for automatically disengaging said hand moved member from the stopping device as soon as the tripping means is operated by the clock movement to again hold said stopping device in normal position, and means for adjusting said tripping means to release said stopping means at any predetermined time.

5. In combination a clock movement, an alarm mechanism, a stopping device for normally preventing the operation of said alarm, tripping means actuated by said clock movement adapted to release said stopping device and allow said alarm to operate until said stopping device is returned to normal position, an engaging member moved by hand to replace and hold said stopping device in its normal position, and means to automatically connect said hand moved member to said clock movement to be moved therewith until said member is disengaged from said stopping device.

6. In combination a clock movement, an alarm mechanism, a stopping device for normally preventing the operation of said alarm, tripping means actuated by said clock movement once in 24 hours adapted to release said stopping device and allow said alarm to operate until said stopping device is returned to normal position, an engaging member moved by hand to replace and hold said stopping device in its normal position, and means to automatically connect said hand moved member to said clock movement to be moved therewith until said member is disengaged from said stopping device, and means for adjusting said stripping means to release said stopping means at any predetermined time.

7. In combination a clock movement, an alarm mechanism, a stopping device for normally preventing the operation of said alarm, tripping means for said stopping device comprising a stationary and adjustable let-off cam and a movable portion resting against said stopping device to hold the same in normal position, said portion being operated by said clock movement once in 24 hours to coact with said let-off cam and release said stopping device, thereby allowing said alarm to operate until said stopping device is returned to normal position, an engaging member moved by hand to replace and hold said stopping device in its normal position and means controlled by the clock movement for automatically disengaging said hand-operated member from said stopping device as soon as the movable portion of said tripping means is operated by the clock movement to again hold said stopping device in normal position, and means for adjusting said let-off cam to coöperate with said movable portion in releasing said stopping device at any predetermined time in the 24 hours.

Signed at New York, N. Y., this 23rd day of February, 1909.

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JAMES WALKER.

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