May 2, 1933. J. R. PUTNAM ET AL 1,906,716

ALARM CLOCK

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Fig. 1.

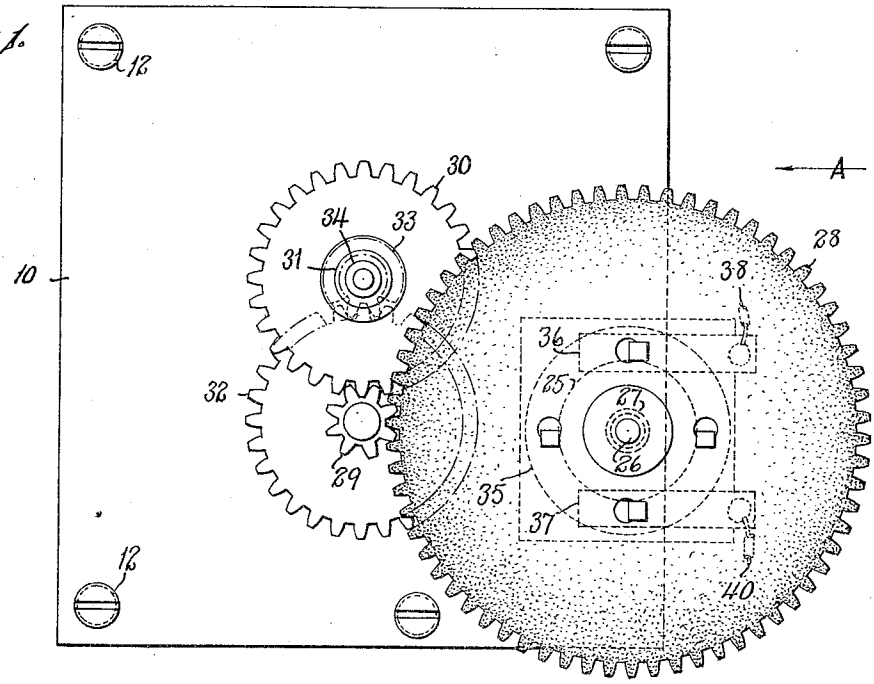
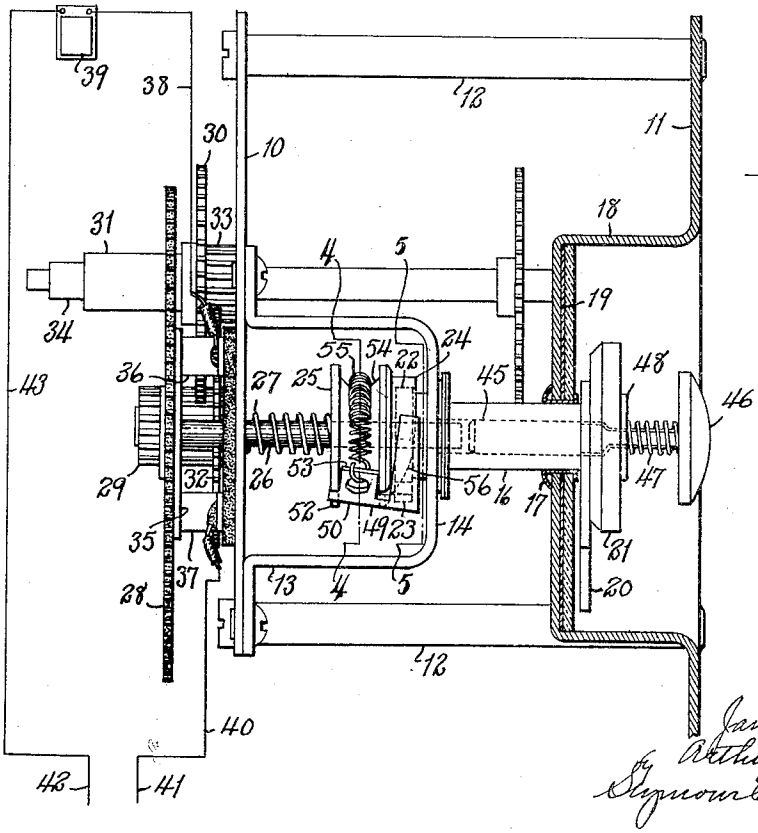


Fig. 2.



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Fig. 3.

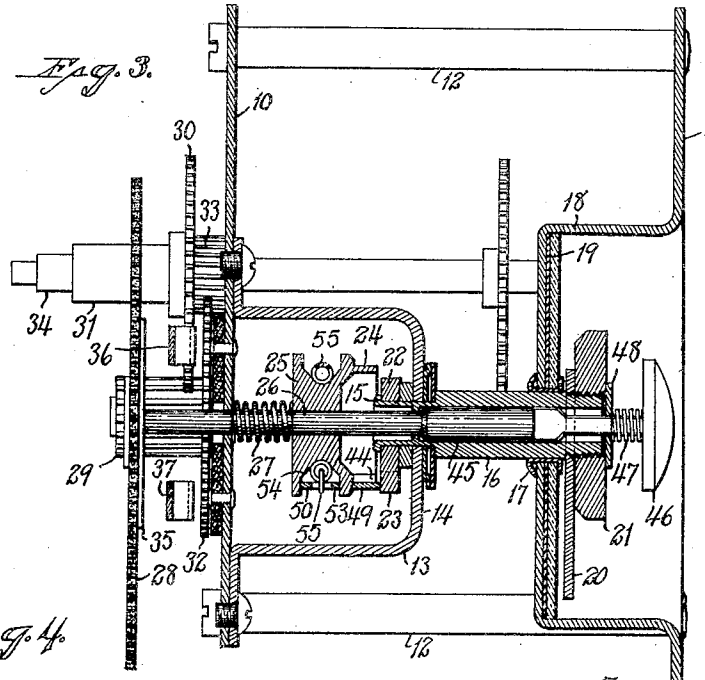


Fig. 4.

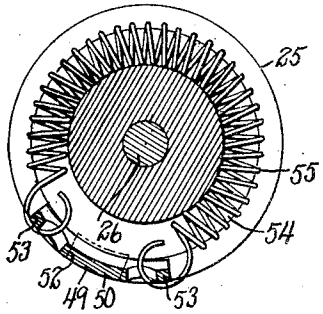


Fig. 5.

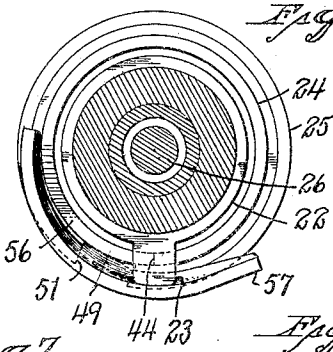


Fig. 6.

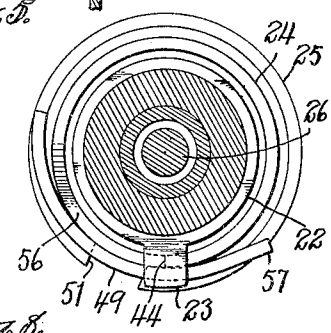


Fig. 7.

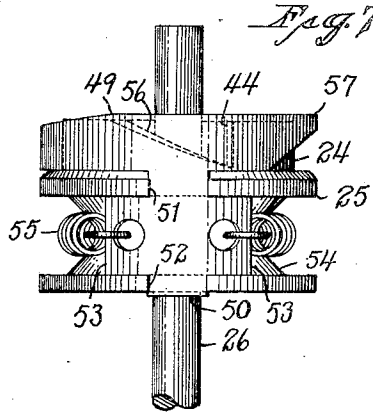


Fig. 9.

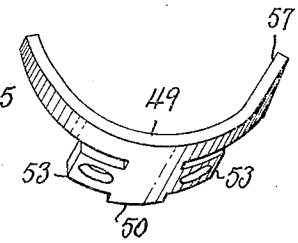
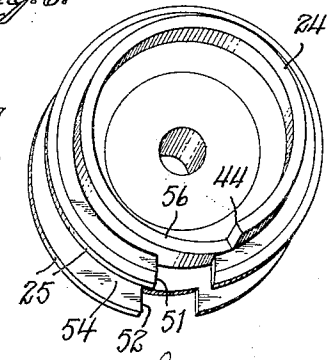


Fig. 8.



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Patented May 2, 1933 1,906,716

UNITED STATES PATENT OFFICE

JAMES R. PUTNAM AND ARTHUR W. HAYDON, OF WATERBURY, CONNECTICUT, ASSIGNORS TO WATERBURY CLOCK COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION

ALARM CLOCK

Application filed October 14, 1931. Serial No. 568,733.

This invention relates to an improvement in alarm clocks and has for its main object the production of an alarm clock having a simple, reliable and convenient automatic alarm-control mechanism constructed with particular reference to superior facility and ease of manual operation also.

With the above and other objects in view, as will appear from the following, our invention consists in an alarm clock having certain features of construction and combinations and arrangements of parts as will be hereinafter described and particularly recited in the claims.

In the accompanying drawings:

Fig. 1 is a view in front elevation of an alarm-clock movement constructed in accordance with our invention, certain of the gear-trains not directly related to our invention being omitted for clarity of illustration;

Fig. 2 is a view thereof mainly in edge elevation, looking in the direction of the arrow A of Fig. 1, but showing the rear plate in section, the parts being shown in the positions which they assume for the sounding of an alarm;

Fig. 3 is a view similar to Fig. 2, but showing the parts in the positions which they assume directly after the manual shutting off of the alarm;

Fig. 4 is a broken detail sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is a similar view taken on the line 5—5 of Fig. 2;

Fig. 6 is a sectional view corresponding to Fig. 5, but showing the guard-plate moved into a position beneath the cam-finger to hold the control-mechanism in its alarm-shut-off position;

Fig. 7 is a broken view in elevation showing the alarm-cam member, shaft and guard-plate in assembled relationship;

Fig. 8 is a perspective view of the alarm-cam member detached; and

Fig. 9 is a similar view of the guard-plate.

For the purpose of illustrating our invention, we have herein chosen to show and describe an electric alarm, though our invention is adapted for the control of other types of alarm clocks such, for instance, as the well-known "spring-driven alarm."

The particular alarm clock herein chosen for the illustration of our invention includes, as shown, a front-plate 10, a back-plate 11 and pillars 12 interconnecting the said plates. Secured to the rear face of the front-plate 10 and rearwardly offsetting therefrom is a substantially U-shaped bracket 13, in the vertical reach 14 of which is supported, with capacity for rotary movement, the reduced inner end 15 of an alarm-set sleeve 16. The rear end of the said sleeve 16 projects through a sheet-metal bushing 17, which latter serves to clamp in place, within an inwardly-depressed portion 18 of the back-plate 11, an alarm-set dial 19. The dial 19 is swept by a pointer 20 mounted upon the rear end of the sleeve 16 and retained in place thereon by a knurled finger-button 21 by means of which latter the said sleeve is turned as required to set the alarm.

Rigidly mounted upon the forward end of the setting-sleeve 16 is a cam-disk 22 provided with a radially-projecting cam-finger 23 coacting in the usual manner of alarm clocks with a sleeve-like annular cam 24, concentrically offsetting from the rear end of a cam-member 25. The cam-member 25, just referred to, is staked or otherwise rigidly secured to an alarm-shaft 26 bearing at its rearward end in the setting-sleeve 16 and bearing adjacent its forward end in the front-plate 10 with capacity for both rotary and axial movement. Encircling the shaft 26 and interposed between the front-plate 10 and the cam-member 25 is a helical spring 27 exerting a constant effort to move the said shaft and its associated parts rearwardly.

Rigidly mounted upon the extreme forward end of the shaft 26 is a gear-wheel 28 meshing into and driven by a dial-pinion 29 forming a feature of the usual dial-work of a clock, which consists also, as shown, of an hour-wheel 30 driven by the said dial-pinion 29 and carrying a forwardly-projecting sleeve 31 for the reception of an hour-hand. The dial-pinion 29 is rigidly attached to a dial-wheel 32 driven by a cannon-pinion 33 (driven in any approved manner by the time-train

of the clock) and having a forwardly-projecting sleeve 34 for the reception of a minute-hand or pointer.

The gear-wheel 28 is preferably formed of fiber or other insulating material and carries upon its inner face a washer-like contact-disk 35 adapted, when the parts are in the positions in which they are shown in Fig. 2, to close an electrical circuit between two complementary resilient contact-fingers 36 and 37, the former of which is connected by means of a wire 38 to a buzzer 39 or any other desired type of electrical signal device, which is diagrammatically illustrated in Fig. 2 of the drawings, though usually mounted within the case of the clock and forming a unitary feature thereof. The contact 37 is connected by means of a wire 40 to one of two line-wires 41, the complementary line-wire 42 of which is connected, by means of a wire 43, to the buzzer 39.

From the foregoing, it will be seen that the gear-wheel 28, together with its shaft 26 and the cam-member 25, will be rotated by the time-train of the clock, represented by the dial work and acting through the dial-pinion 29. Hence, in the usual manner of alarm-mechanisms, when the drop-off nose 44 of the alarm-cam 25 rides past the cam-finger 23, the cam-member, shaft 26, wheel 28 and contact-disk 25 will be permitted to snap rearwardly as a unit under the urge of the spring 27, with the effect of engaging the said disk with the complementary contacts 36 and 37 to close the circuit therebetween and thus energize the buzzer 39 or other suitable electrical signal device.

To provide for the manual shut-off of the alarm, we employ an alarm shut-off plunger 45 mounted with capacity for reciprocating movement within the hollow interior of the sleeve 16 and provided at its rear end with a finger-button 46 by means of which it may be manually moved forwardly against the counter-urge of a helical spring 47 encircling the reduced rear end of the said plunger and interposed between the finger-button 46 and a washer 48 resting against the rear face of the setting-button 21.

A forward thrust upon the plunger 45 will move the shaft 26 together with its cam-member 25, gear-wheel 28 and contact-disk 35, forwardly, with the effect of disconnecting the contacts 36 and 37 and so effecting the stoppage of the alarm.

To releasably hold the shaft 26 and the parts carried thereby in their alarm-shut-off positions, as just above described, we employ a segmental guard-plate 49 having a stem 50 seated in longitudinal notches or guard-retaining sockets 51 and 52 cut in the periphery of the cam-member 25 so as to prevent any movement of the guard-plate circumferentially with respect to the said cam-member 25.

The stem 50 of the guard-plate is provided with a pair of oppositely-extending ears 53 fitting within an annular groove 54 formed in the cam-member 25 and serving to prevent the displacement of the guard-plate longitudinally with respect to the said cam-member and provided respectively with perforations for the reception of the terminals of a helical spring 55. The said spring 55 is located in the groove 54 in the cam-member before referred to, and serves to exert a constant effort to pull the guard-plate 49 inward so as to cause the upper end of the same to closely hug the periphery of the cam 24 adjacent the cam-notch 56 therein.

As thus mounted, the guard-plate 49 is held in place by the spring 55 against relative axial or peripheral movement with respect to the cam-member 25, but with capacity for rocking movement from the position in which it is shown in Fig. 3 to the position in which it is shown in Fig. 2, for the purpose as will hereinafter appear.

It will be noted by reference in particular to Fig. 7 of the drawings that the rear portion of the guard-plate 49 normally overlaps the cam-notch 56 in the cam 24 and has its rear edge extending beyond the rear edge of the said cam. One end of the guard-plate is bent outward away from the periphery of the cam 24 to provide a finger 57 which is adapted to engage with the outer edge of the cam-finger 23 so as to tilt the said guard-plate as shown in Fig. 5.

Let it be presumed that the parts are in the positions in which they are shown in Fig. 2, in which position the alarm is being sounded. If now, a forward thrust is exerted upon the plunger 45 by means of its finger-button 46, the unit comprising the shaft 26, cam-member 25, wheel 28 and contact-disk 35 will be moved forward against the counter-urge of the spring 27 with the effect of moving the disk 35 out of engagement with the contacts 36 and 37, to thus shut off the alarm.

When the cam-member 25 has been moved sufficiently forward, as just above described, to clear the rear portion of the guard-plate 49 from the cam-finger 23, the said plate will be snapped inward by the spring 55 into position beneath the said cam-finger, as shown in Fig. 3 of the drawings, with the effect of latching, so to speak, the disk 35 out of engagement with its complementary contacts 36 and 37.

As time goes on, the cam will be rotated by the time-train until the guard-plate has been rotated by the cam-member 25, out from under the cam-finger 23, which latter will then ride upon the high portion of the cam 24 until such time as in the rotary movement described, the finger 57 of the said guard-plate is brought into engagement with the said cam-finger 23, which will effect the tilting of the guard-plate outward into the posi-

tion shown in Figs. 2 and 5, so that the said guard-plate is rendered inoperative and does not interfere at this time with the alarm-controlling action of the cam-finger 23 and the drop-off nose 44.

As soon as the drop-off nose 44 has been rotated past the cam-finger 23, the cam-member 25, shaft 26, wheel 28 and disk 35 will be moved by the spring 27 axially rearward from the position shown in Fig. 3 to that shown in Fig. 2 with the effect of electrically interconnecting the contacts 36 and 37 for the sounding of an alarm. The alarm may now be manually shut off by a thrust upon the plunger 45 as already described, preparatory to another cycle of operation.

The guard-plate 49 thus provides simple and reliable automatically-retirable means for latching the alarm-control mechanism in its shut-off position after the same has been manually moved into such position.

Our invention, as shown and described herein, is applied to the control of an electric alarm, but it is apparent, without further illustration, that the guard-plate 49 and associated parts will perform their functions as effectively regardless of the type of alarm employed.

It will be understood by those skilled in the art that our invention may assume varied physical forms without departing from our inventive concept and we, therefore, do not limit ourselves to the specific embodiment herein chosen for illustration, but only as indicated in the appended claims.

We claim:

1. In an alarm-control mechanism, the combination with an alarm-cam provided with a cam-notch, an annular groove and a longitudinal groove intersecting the same; of a cam-finger coacting with the said cam; means for causing relative rotary movement between the said cam and cam-finger; manually-operable means for moving the said cam and cam-finger axially one with respect to the other; and an outwardly-yielding guard-member having portions fitting into both the annular and longitudinal grooves in the said cam and normally overlapping the cam-notch therein in position to releasably hold the said cam-finger from immediate reentry into the said cam-notch when separated therefrom by the said manually-operable means and engageable with the said cam-finger for being forced into a retired position upon relative rotary movement between the same and the said cam.

2. In an alarm-control mechanism, the combination with an alarm-cam provided with a cam-notch, an annular groove and a longitudinal groove intersecting the same; of a cam-finger coacting with the said cam; means for causing relative rotary movement between the said cam and cam-finger; manually-operable means for moving the said cam and cam-finger axially one with respect to the other; an outwardly-yielding guard-member having portions fitting into both the annular and longitudinal grooves in the said cam and normally overlapping the cam-notch therein in position to releasably hold the said cam-finger from immediate reentry into the said cam-notch when separated therefrom by the said manually-operable means and engageable with the said cam-finger for being forced into a retired position upon relative rotary movement between the same and the said cam; and a spring located in the annular groove in the said cam and engaged with the said guard-member for exerting a constant effort to yieldingly hold the same inward toward the said cam-notch.

3. In an alarm-control mechanism, the combination with an alarm-control cam-member having a cam-notch and a guard-retaining socket; a cam-finger coacting with the said cam; means for causing relative rotary movement between said cam-member and cam-finger; manually-operable means for moving the said cam-member and cam-finger axially one with respect to the other; a radially-yielding guard-member carried by the said cam-member with capacity for radial tilting movement with respect thereto, and having a portion seated in the guard-retaining socket thereof, and normally overlapping the cam-notch therein in position to releasably hold the said cam-finger from immediate reentry into the said cam-notch when separated therefrom by the said manually-operable means and engageable with the said cam-finger for being tilted into a retired position upon relative rotary movement between the same and the said cam-member; and spring-means carried by the said cam-member and exerting an effort to swing the said guard-member into overlapping relationship with respect to the cam-notch in the said cam-member and simultaneously seat a portion of the said guard-member in the guard-retaining socket in the said cam-member.

4. An alarm-control mechanism as set forth in claim 3 and having the said spring-means arranged to embrace the said cam-member and engage at its respective opposite ends with the said guard-member.

In testimony whereof, we have signed this specification.

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