June 16, 1936. J. R. PUTNAM 2,044,543

ALARM CLOCK

Filed Dec. 15, 1934

Fig. 1.

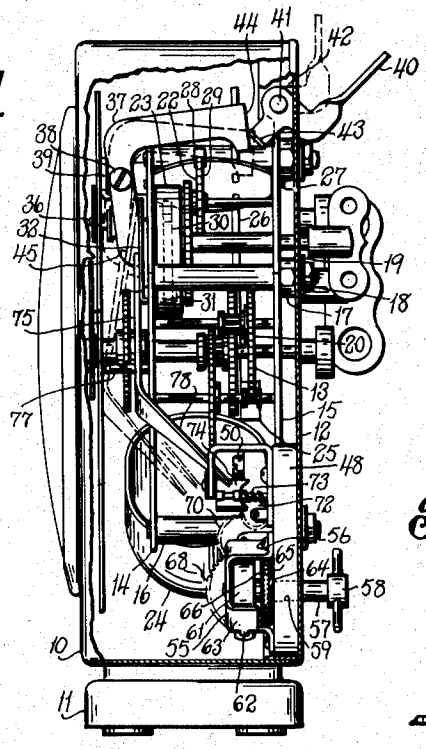


Fig. 3.

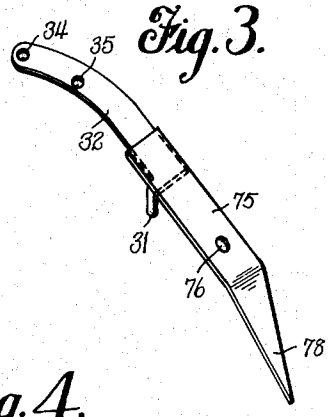


Fig. 4.

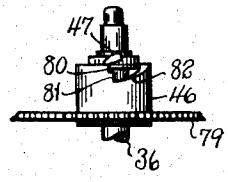
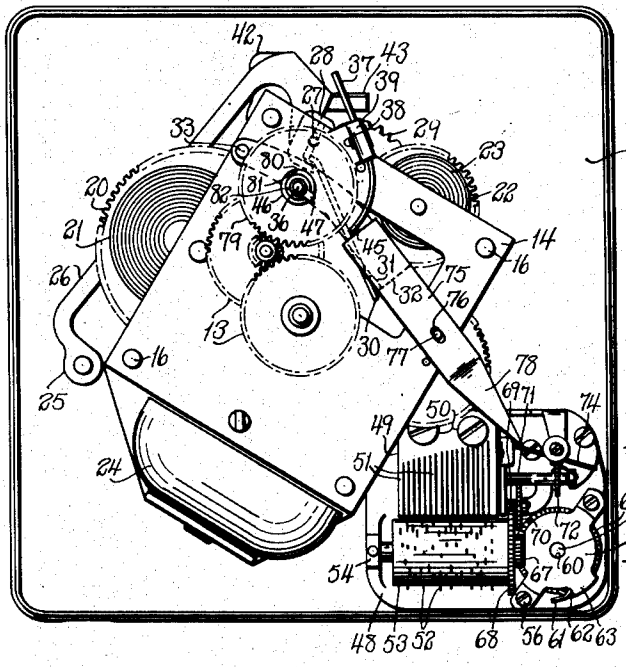


Fig. 2.



-INVENTOR-

James R. Putnam

-ATTORNEYS-

Lyon & Lyon, Earle & Nichols

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ALARM CLOCK

James R. Putnam, Waterbury, Conn., assignor to The Waterbury Clock Company, Waterbury, Conn., a corporation

Application December 15, 1934, Serial No. 757,651

2 Claims. (Cl. 58—23)

This invention relates to alarm clocks, and more particularly to alarm clocks having a plurality of different alarms.

One object of this invention is to provide an improved alarm clock having a plurality of alarms, each having an alarm-train, driving-means and supporting-structure therefor organized as a unit.

Another object of this invention is to provide an improved alarm clock in which a plurality of separate organized alarm-units are all mounted on a single unitary base.

Another object of this invention is to provide an improved alarm clock having separate organized alarm-units, all carried by a case-back or back-plate of an alarm clock.

Another object of this invention is to provide an improved alarm clock having a main movement including a time-train, a main alarm-train, and driving-means and supporting-structure therefor, all organized as a main unit, together with a secondary movement including a secondary alarm-train and driving-means and supporting-structure therefor, all organized as a secondary unit, with release and shut-off mechanism mounted on the main unit and having a secondary alarm-release and shut-off extension extended to the secondary unit.

With the above and other objects in view, this invention includes all improvements over the prior art which are disclosed in this application.

In the accompanying drawing, in which one way of carrying out the invention is shown for illustrative purposes:

Fig. 1 is an edge elevation with the case partly broken away, of an alarm clock made in accordance with this invention;

Fig. 2 is a front elevation of the main and secondary movements mounted on the case-back and with the dial and hands omitted;

Fig. 3 is a perspective view of the alarm-release and shut-off member for both the main and secondary alarms; and

Fig. 4 is an enlarged fragmental elevation of the alarm-control mechanism.

In the description and claims, the various parts are identified by specific names for convenience, but they are intended to be as generic in their application as the prior art will permit.

Referring to the drawing, 10 is a clock-case having a base 11 and a removable case-back or back-plate 12. A main movement 13 includes front and rear movement-plates 14 and 15 connected by the four pillars 16, which latter are clamped to the case-back 12 between the inner nuts 17 and the outer nuts 18 and washers 19. The main movement 13 has a usual time-train 20 driven by a usual mainspring 21 and a main alarm-train 22 driven by a main alarm-spring 23. The bell or sounding-member 24 is adapted to be actuated by a hammer 25 carried by or formed on a hammer-arm 26 pivoted at 27 in the front and rear movement-plates 14 and 15.

The hammer-arm 26 has formed thereon or secured thereto a verge 28 actuated by the verge-wheel 29 of the alarm-train 22. The hammer-tail or finger 30 is formed on or secured to the hammer-arm 26 and vibrates or oscillates when the hammer 25 is oscillating in its movement of striking the bell 24. The hammer-tail 30 is adapted to be engaged by a stop-finger 31 formed on or secured to the alarm-release and shut-off arm 32, which is preferably formed of spring-metal, such, for example, as spring-brass, and is firmly secured to the front movement-plate 14 by the riveted end of the stud 33 which extends through the aperture 34 in the alarm-release and shut-off arm 32, to which stud the mainspring 21 is anchored. The arm 32 has an aperture 35 slidably engaging the alarm-set staff 36.

An L-shaped alarm-shut-off lever 37 is pivoted by means of a screw 38 to a bracket 39 secured to the front movement-plate 14. A manual or finger-shut-off lever 40 is pivoted at 41 to a bracket 42 clamped between one of the nuts 17 and the case-back 12. The finger-shut-off 40 has a reach 43 adapted to engage the end 44 of the lever 37 when the shut-off 40 is moved to the position shown in solid lines in Fig. 1, to swing the control-end 45 of the lever 37 down into engagement with the arm 32 to yieldably press the latter downward to bring the stop-finger 31 into engagement with the hammer-tail 30, thus serving to hold the hammer locked against oscillation. When the finger-shut-off 40 is moved to the dotted-line position shown in Fig. 1, the spring-arm 32 is released, whereupon the movements of the arm 32 are controlled by the alarm-control cam 46, the alarm-control finger 47 and the alarm-set staff 36, as will be hereinafter described.

The secondary alarm movement includes a base 48 secured by screws or otherwise to the case-back 12. An alarm-sounding member 49 in the form of a plate is secured by screws 50 to the base 48 and has musical keys or spring-fingers 51 of different pitch. The musical keys 51 are adapted to be lifted and suddenly released by the pins 52 which are securely mounted in the cylinder 53, which cylinder is pivoted at one end in a

bearing 54 in the base 48, and at its opposite end is pivoted in a downward extension of the bracket 55, which latter is secured by screws 56 to the base 48.

A winding-arbor 57 has a winding-key 58 and is pivotally mounted at 59 in the base 48 and at 60 in the bracket 55. An alarm-spring 61 has one end secured at 62 to the downwardly-extending finger 63 of the bracket 55, and has its other end secured to the winding-arbor 57, which latter also has secured thereto a pawl 64 adapted to engage the ratchet-teeth 65 formed on one side of a gear 66 rotatably mounted on the winding-arbor 57. The gear 66 meshes with and drives a gear 67 secured to the cylinder 53. Also secured to the cylinder 53 is a large speed-control gear 68 which meshes with a small gear 69, which latter is rigidly connected with a larger gear 70, the latter meshing with the long gear 71 which has rigidly secured to it a worm-wheel 72 meshing with a worm 73, to which latter is rigidly secured the butterfly air-vane 74.

The arm 32 preferably has secured thereto by soldering or otherwise an extension 75, preferably of heavier metal than the arm 32 for stiffness, and has a guide-hole 76 slidably engaging a pin 77 secured to the front movement-plate 14. The extension 75 has a downwardly-bent end 78 adapted, when in the full-line position shown in Fig. 1, to engage and lock the air-vane 74, and when in the partially-raised dotted-line position indicated in Fig. 1, to release the air-vane 74, and when in the fully-raised dotted-line position indicated in Fig. 1, to release both the air-vane 74 and the hammer-tail 30, as will be more fully hereinafter explained.

In operation, by means of the alarm-set staff 36, the alarm-mechanism can be-set for any desired time of operation, in the usual manner. When the gear 79, to which the alarm-control cam 46 is secured, rotates the cam 46 to bring the notch 80 opposite the alarm-control finger 47, the spring-arm 32 pushes the gear 79 and cam 46 axially of the staff 36 until stopped by the base of the notch 80, this movement permitting the arm 32 to rise sufficiently to bring the end 78 to the intermediate dotted-line position sufficiently far above the butterfly control-vane 74 to release the latter, whereupon the spring 61, through the mechanism described, causes the cylinder 53 to rotate, with the result that the pins 52 lift the musical spring-fingers 51 and release the same with a snap release, whereby the fingers vibrate to produce musical tones which may be in accordance with any pattern or tune desired, depending upon the number and arrangement of the pins 52 on the cylinder 53.

The speed and uniformity of rotation of the cylinder 53 is controlled by means of the rapid rotation of the butterfly air-vane 74, which, by its rapid rotation and friction with the air, acts as a drag or brake through the control-gearing 73, 72, 71, 70, 69, and 68. As the time-train 20 continues to rotate the gear 79, the notch 81 comes opposite the finger 47, whereupon the spring-arm 32 pushes the gear 79 and cam 46 still further until the bottom of the notch 81 is reached, thus permitting the arm 32 to rise to the fully-raised dotted-line position sufficiently high to cause the finger 31 to rise out of engagement with the hammer-tail 30, thus resulting in the hammer 25 being oscillated in the usual manner by the main alarm-train to actuate the main or loud sounding-member 24.

As the time-train continues to rotate the gear 79 and cam 46, the control-finger 47 finally rides up the incline 82 of the cam 46 and results in the cam 46 and gear 79 being forced downwardly to press the spring-arm 32 to its original position, in which the finger 31 holds the hammer-tail 30 in inoperative position, and in which the extension 75 engages and holds the butterfly air-vane 74 against rotation.

The invention may be carried out in other specific ways than that herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. An alarm-clock construction including: a main movement including a time-train, a main alarm-train, and driving-means and supporting-structure therefor, all organized as a main unit; a secondary movement including a secondary alarm-train, and driving-means and supporting-structure therefor, all organized as a secondary unit; a main alarm-release and shut-off spring-arm mounted on the main unit and having a secondary alarm-release and shut-off extension carried by and rigid with said shut-off arm and extended to the secondary unit and adapted to first release said secondary alarm-train and to later release said main alarm-train; means adapted to partially release said arm to first release said secondary alarm-train and later to further release said arm to later release said main alarm-train; and guide-means mounted on said main unit and slidably engaging and guiding said spring-arm.

2. An alarm-clock construction including: a main movement including a time-train, a main alarm-train, and driving-means and supporting-structure therefor, all organized as a main unit; a secondary movement including a secondary alarm-train, and driving-means and supporting-structure therefor, all organized as a secondary unit; and a main alarm-release and shut-off arm mounted on the main unit and having a secondary alarm-release and shut-off extension carried by and rigid with said shut-off arm and extended to the secondary unit, and means adapted to partially release said arm to first release said secondary alarm-train and later to further release said arm to later release said main alarm-train.

JAMES R. PUTNAM.