

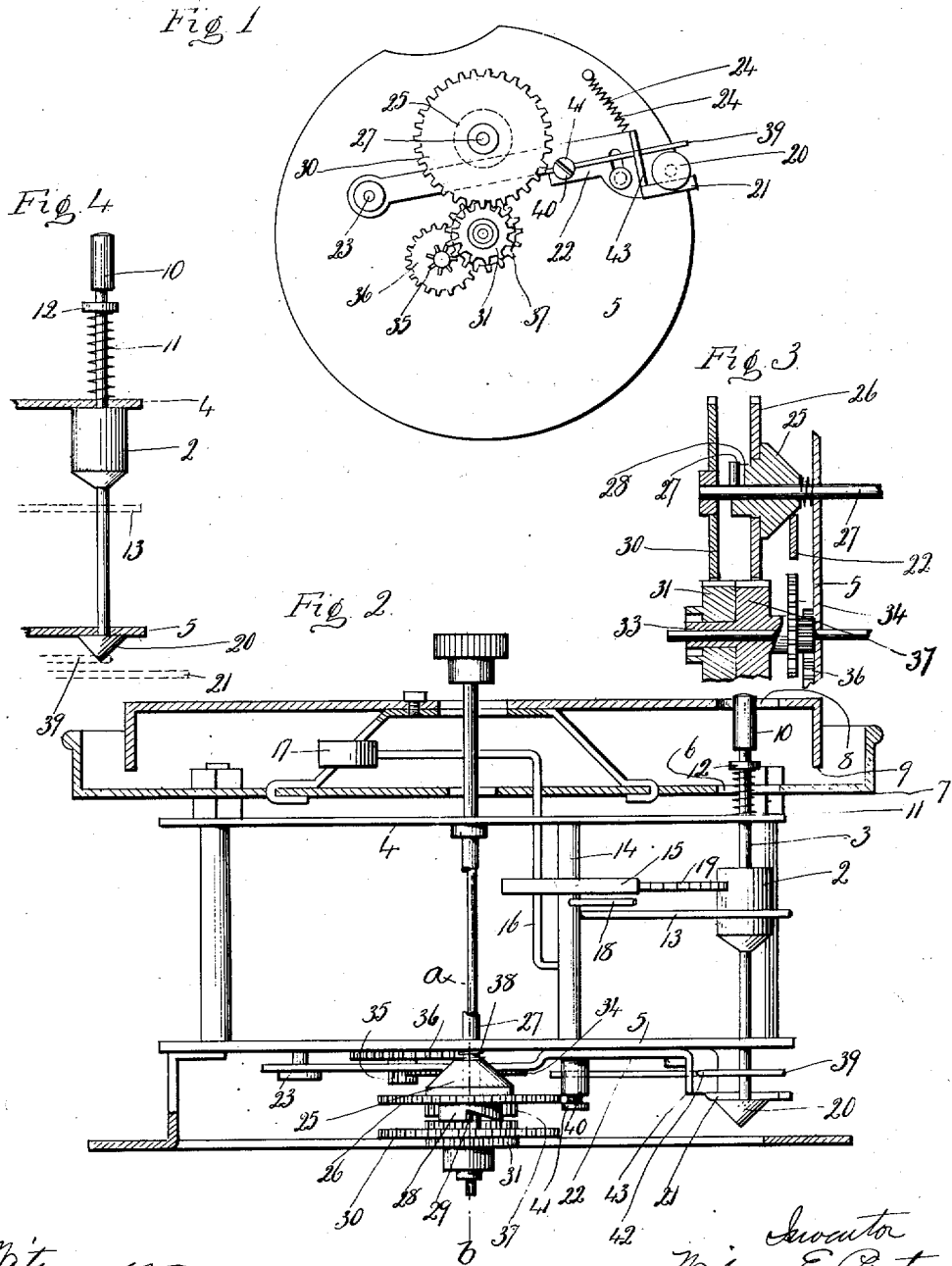
W. E. PORTER.

ALARM CLOCK.

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956,824.

Patented May 3, 1910.



Witnesses
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UNITED STATES PATENT OFFICE.

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ALARM-CLOCK.

956,824.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILSON E. PORTER, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Alarm-Clocks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the characters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1 a view in front elevation of an alarm-clock movement constructed in accordance with my invention, the conical detent carried by the manual push-rod being shown as engaged with the detent-finger of the let-off lever. Fig. 2 a broken view of the clock partly in plan and partly in horizontal section, this view, which is on an enlarged scale, also showing the detent as engaged with the detent-finger of the releasing-lever. Fig. 3 a broken view in vertical section on the line *a b* of Fig. 2, showing in particular the mounting of the operating-cone upon the alarm-cam wheel. Fig. 4 a broken detail view partly in plan and partly in horizontal section, showing the manual push-rod in its retired position in which it leaves the alarm-mechanism free to sound the alarm.

My invention relates to an improvement in alarm-clocks of that class in which the alarm-spring is prevented from running down by the stopping of the alarm-mechanism of the clock by the user thereof, and which continue, without resetting the alarm, to be sounded at the same hour every day until the clock needs re-winding, the object of my present invention being to simplify, and hence cheapen and make more reliable, the alarm-mechanism of clocks of this class as well as to lessen the amount of power required to operate the alarm-mechanism.

With these ends in view my invention consists in an alarm-clock having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In carrying out my invention as herein shown, I employ a cylindrical stop-plug 2 fixed upon a longitudinally movable push-rod 3 passing from rear to front through the rear and front movement-plates 4 and 5, in which it is supported. The said rod pro-

jects rearward through a hole 6 in the removable disk-shaped sheet-metal back 7 of the clock-case and also through a hole 8 in the shallow flanged bell 9 which is arranged concentrically with the said back 7 and partly entered into the same as shown in Fig. 3. At its extreme rear end the rod 3 is provided with a finger-button 10 by means of which it is pushed from rear to front against the tension of a spring 11 encircling its rear portion and interposed between the rear face of the rear movement-plate 4 and a collar 12 mounted upon the rod, the spring exerting a constant effort to move the rod from front to rear into its retired position in which it is shown in Fig. 4. The said stop-plug 2 coacts with a stop-wire 13 reaching over and riding upon it and carried by a verge-arbor 14 which also carries the verge 15, the hammer-wire 16 of the hammer 17, and the cut-out wire 18 which coacts with the cut-out lever, not shown, but of usual form, arrangement and operation. When the rod 3 is pushed from rear to front against the tension of its spring 11, the stop-wire 13 rides up over the forward end of the plug 2 and rests upon the cylindrical periphery thereof, whereby the verge-arbor 14 is sufficiently rocked to lock the verge 15 into the escapement-wheel 19, and so arrest the running of the alarm-train which may be of any approved construction.

Thus far my improved mechanism follows the mechanism shown and described in my concurrently pending application filed January 3, 1910, and serially numbered 536,167.

At its projecting forward end, the push-rod is furnished with a conical-detent 20 for coaction with the detent-finger 21 of a relatively long let-off lever 22 hung upon a stud 23 entering the front movement-plate 5. A helical spring 24 connected with the free end of this lever exerts a constant effort to hold its upper edge in engagement with an operating-cone 25 projecting from the inner face of an alarm-cam wheel 26 mounted upon the alarm-setting shaft 27 so as to be rotatably and longitudinally movable thereupon. The cone 25 extends forward, through the said wheel 26 and is shaped to form an alarm-cam 28 the edge of which coacts in the usual manner with an operating-pin 29 mounted in the shaft 27 and located directly back of an alarm-setting wheel 30 rigidly fixed upon the extreme forward end

of the shaft 27 and meshing into a pinion 31 carrying an alarm hand which is not shown, but which sweeps over the clock-face, also not shown, the said pinion 31 being
 5 mounted so as to turn loosely upon the hour-hand socket or sleeve 33 which carries at its rear end the hour-wheel 34 which meshes into a dial-pinion 35 carried by a dial-wheel 36 driven in the usual manner. The socket
 10 or sleeve 33 carries at a point in front of the hour-wheel 34, a wide pinion 37 meshing into and driving the alarm-cam wheel 26. A helical spring 38 interposed between the cam 25 and the front face of the front movement-plate 5, exerts a constant effort to hold
 15 the edge of the alarm-cam 28 in engagement with its operating-pin 29 and assists in pushing the said cone forward on the shaft 27 when the pin 29 drops into the drop of
 20 the cam 28.

As the alarm-cam wheel 26 is driven by the time-train, it is gradually forced from front to rear by the coaction of the alarm-cam 28 with the pin 29, whereby the cone
 25 25 coacts with the upper edge of the lever 22 and gradually depresses the same against the tension of the spring 24, with the effect of gradually moving the detent-finger 21 downward away from the conical detent
 30 20 which when it is released by the said arm 21 to the action of the spring 11 tending to pull the push-rod 3 from front to rear, will have the upper portion of its inner face engaged by a yielding warning-wire 39
 35 mounted in a stud 40 carried by the lever 22, the said stud being furnished with a binding-screw 41 by means of which the wire 39 is held in place and the said wire 39 passing outward through a vertical slot 42
 40 formed in an integral arm 43 bent forward at a right angle from the plane of the lever 22 and carrying the said finger 21 which is made in the same piece with it. After the detent 20 has been engaged with the
 45 warning-wire 39 it will be held thereby until the drop of the alarm-cam 28 is brought by the action of the time-train into registration with the pin 29, whereupon the spring 38 immediately operates to push the operating-cone 25 forward away from the upper edge
 50 of the lever 22 which is then lifted by the spring 24 and the warning-wire 39 disengaged from the detent 20. The spring 11 now asserts itself to quickly retire the push-rod 3, whereby the stop-plug 2 is moved rearward out of range of the stop-wire 13
 55 which is now released so as to permit the alarm-mechanism to start up and sound the alarm, which will continue to be sounded until the user of the clock "gets up" and manually pushes the rod 3 forward so as to again block the vibration of the arm 13 by moving the plug 2 under it. As the rod
 60 is pushed forward the detent 20 at its forward end is reengaged with the finger 21

of the lever 22, whereby its alarm-train is cut out of action as it were.

It will be seen from the foregoing that the detent 20 is released from the finger 21 by the progressive action of the cone 25 and
 70 from the warning-wire 39 by the sudden action of the spring 38 in pushing the cone 25, and hence the alarm-cam wheel 26 and alarm-cam 28, suddenly forward when the drop of the cam 28 is brought into registra-
 75 tion with the pin 29. In other words, the alarm is not finally let off by the progressive inward movement of the cone 25 but by the sudden outward displacement thereof.

Normally the detent 20 will coact with the
 80 finger 21 when the push-rod 3 is manually pushed forward for stopping the alarm. In case, however, the sounding of the alarm should take place when the lever 22 has been depressed by the cone 25 so far as to
 85 carry the arm 21 below the detent 20, the warning-wire 39 will spring to permit the detent to be snapped over it, as it were. If the warning-wire 39 were not present for this purpose, and not made yielding, in certain
 90 positions of the lever 22 the sounding of the alarm could not be stopped. Therefore the wire 39 while always discharging its own proper warning function, at certain times also discharges the initial detent func-
 95 tion of the finger 21 of the lever 22.

After the alarm has sounded and roused the sleeper, he must "get up" and go to the clock and press the finger-button 10 and move the push-rod 3 from rear to front, and
 100 so stop the alarm-train which would be immediately started again by the action of the spring 11 in retiring the rod 3 and hence the plug 2, if it were not for the fact that when the rod is pushed forward, its
 105 conical detent 20 will ordinarily be caught and the rod held at the limit of its forward excursion, by the finger 21 of the lever 22, which will be momentarily pushed aside for this coupling engagement. The lever 22
 110 now operates for a longer or shorter time according to details of construction, to hold the push-rod 3 in its operative position as described. Meanwhile the time-train is gradually depressing the lever 22 prepara-
 115 tory to releasing the conical detent 20 from its finger 21. When that happens the detent 20 under the influence of the spring 11 drops, as it were, from the finger 21 to the warning-wire 39, whereby the rod 3 is still
 120 prevented from moving from front to rear sufficiently to clear the plug 2 from the arm 13. When twenty-four full hours since the last sounding of the alarm have expired, the drop of the alarm-cam 28 will be brought
 125 into registration with the pin 29, leaving the helical spring 28 free to act to suddenly move the cone 25 forward. As the cone moves forward the lever 22 is lifted by the spring 24 and the detent 20 is released from
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the warning-wire 39, leaving the rod 3 free to be retracted by its spring 11, whereby the plug 2 is cleared from the wire 13 so as to permit the alarm to be again sounded. It will thus be seen that the rod 3 is normally held in one or the other of its two forward positions and only moves to the limit of its rearward excursion once in twenty-four hours and then remains in that position, under ordinary circumstances, only during the brief interval of the sounding of an alarm.

It will now be understood that the invention of my present application is distinguished from the invention of my concurrently pending application filed January 3, 1910, and serially numbered 536,167, by the fact that whereas in the clock of the said co-pending application the operating-cone is secured to a plate fastened at one end to a flat spring secured to the front movement-plate, in my present construction, the corresponding operating-cone is carried by the alarm-cam wheel of the alarm-mechanism.

I claim:—

1. In an alarm-clock, the combination with the time-mechanism thereof, of an alarm-mechanism including a stop-wire, a manually operable push-rod, a stop-plug mounted thereupon for coaction with the stop-wire in arresting the alarm-mechanism, a detent on the push-rod, a lever coacting with the detent for holding the push-rod in its operating position, and a cone carried by the alarm cam of the alarm-mechanism and coacting with the lever for automatically releasing the said detent and hence the push-rod, preparatory to sounding the alarm.

2. In an alarm-clock, the combination with

the time-mechanism thereof, of an alarm-mechanism, a push-rod for stopping the alarm-mechanism, a lever coacting with the push-rod for normally detaining the same in its operating position, and a laterally movable cone driven by the time-train and coacting with the lever for moving the same to release the push-rod.

3. In an alarm-clock, the combination with the time-mechanism thereof, of an alarm-mechanism, a push-rod for arresting the alarm-mechanism, a lever coacting with the push-rod, a warning-wire carried by the said lever and also coacting with the push-rod, and a laterally movable cone driven by the time-train and coacting with the said lever for releasing the same from the push-rod.

4. In an alarm-clock, the combination with the time-mechanism thereof, of an alarm-mechanism including a stop-wire, a manually operated push-rod, a stop-plug carried by the said rod and coacting with the stop-wire for arresting the alarm-mechanism; a detent carried by the push-rod, a lever coacting with the detent, a warning-wire carried by the said lever and also coacting with the detent, an alarm-setting shaft, an alarm-cam wheel mounted thereupon, and a cone carried by the said alarm-cam wheel and coacting with the edge of the lever which it operates for releasing the detent from the said lever and from the said warning-wire.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

WILSON E. PORTER.

Witnesses:

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CLARA L. WEED.