W. E. PORTER.

INTERMITTENT ALARM CLOCK.

APPLICATION FILED JAN. 3, 1910.

952,212.

Patented Mar. 15, 1910.

2 SHEETS—SHEET 1.

Fig. 1

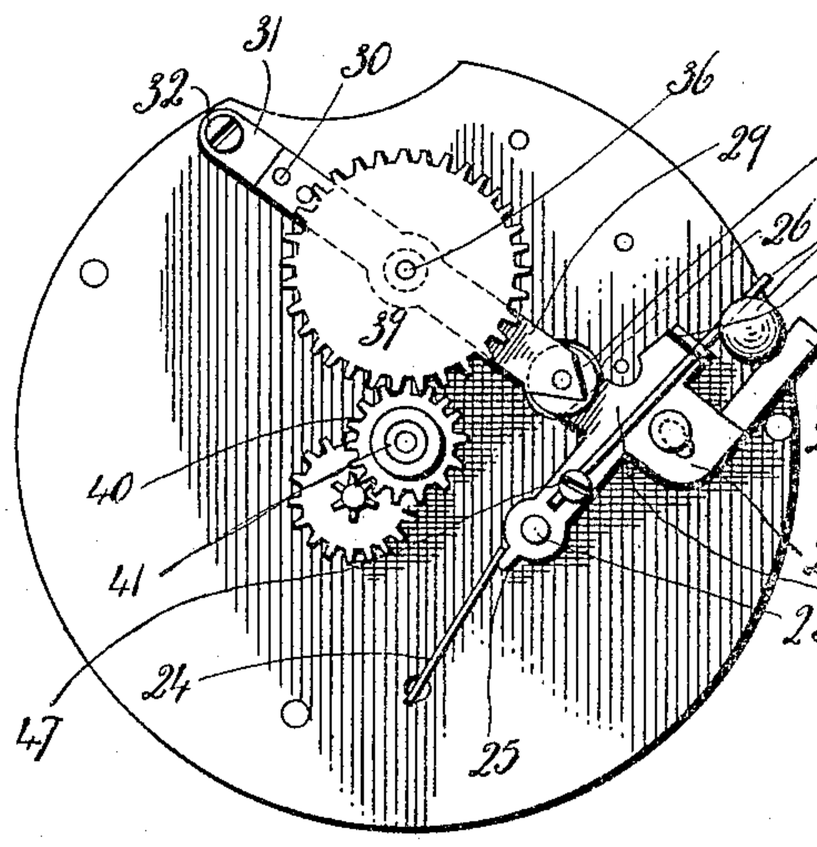


Fig. 2.

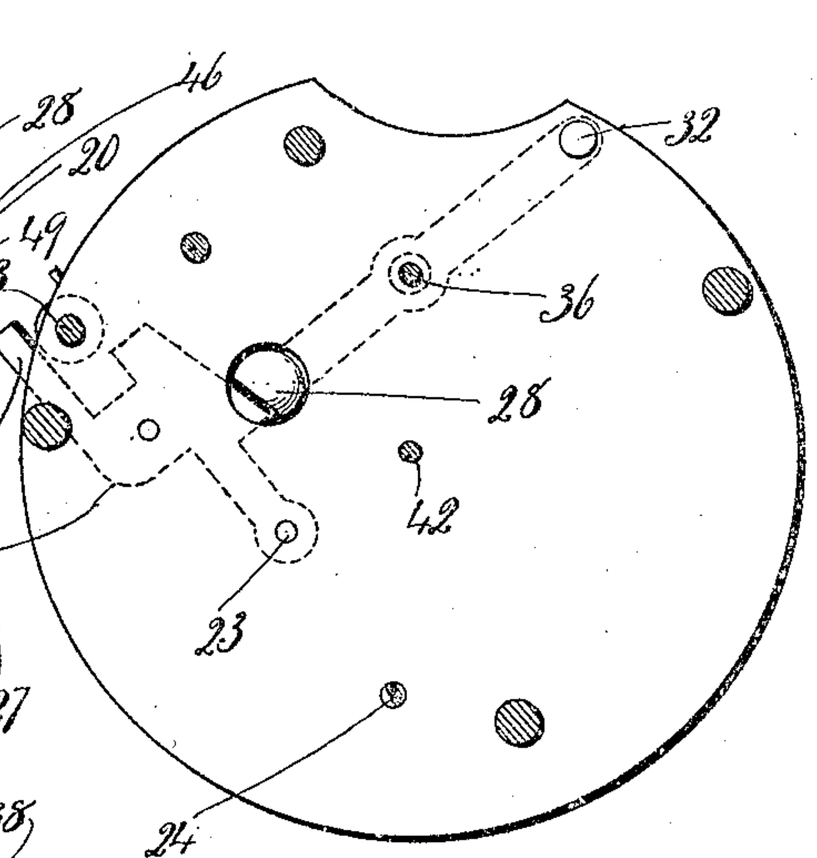
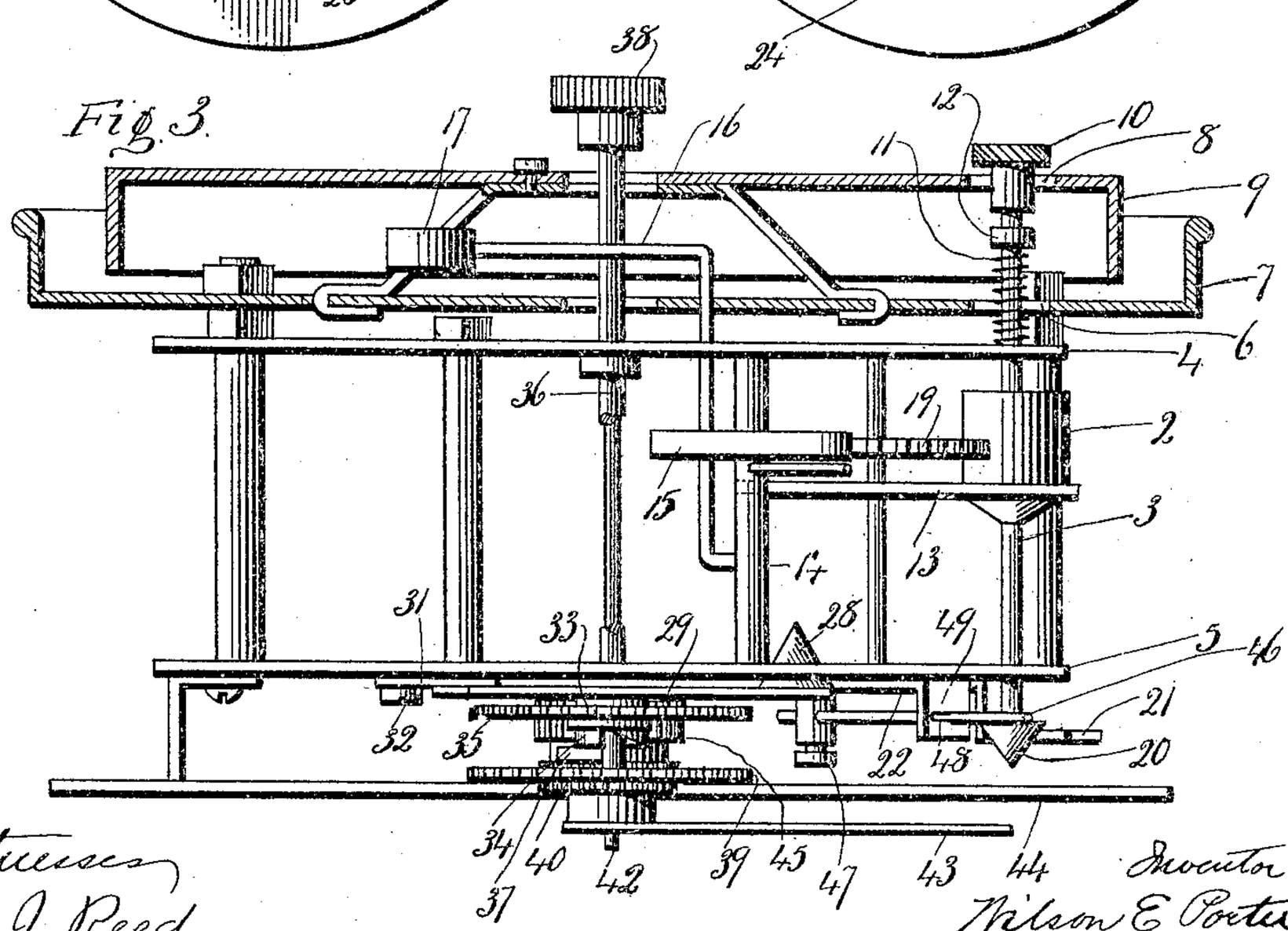


Fig. 3.



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2 SHEETS—SHEET 2.

Fig 4

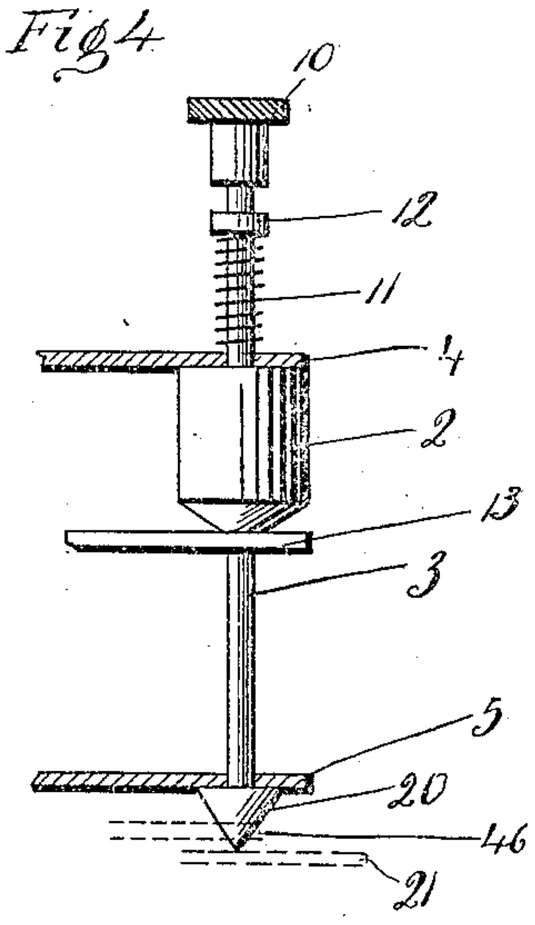


Fig 5

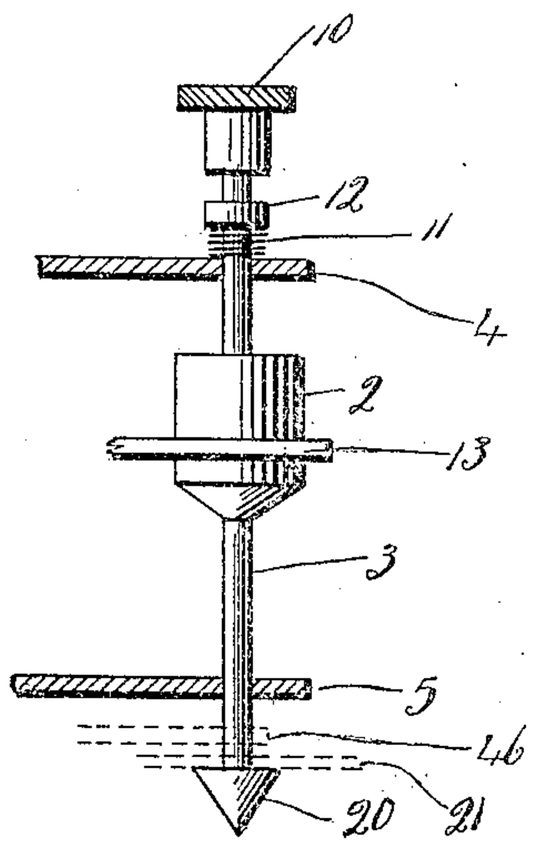


Fig 6.

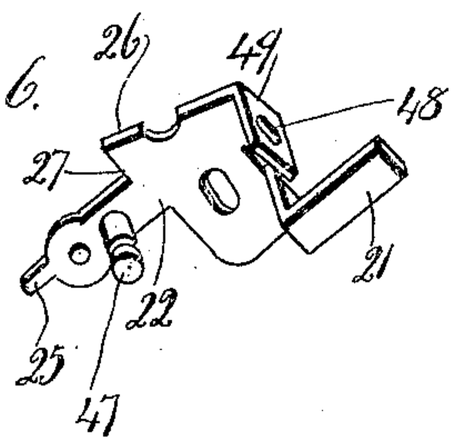
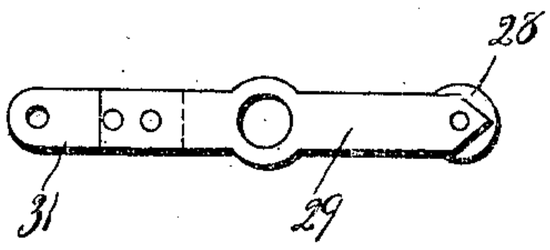


Fig 7.



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UNITED STATES PATENT OFFICE.

WILSON E. PORTER, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO NEW HAVEN CLOCK CO., OF NEW HAVEN, CONNECTICUT, A CORPORATION.

INTERMITTENT-ALARM CLOCK.

952,212. Specification of Letters Patent. **Patented Mar. 15, 1910.**

Application filed January 3, 1910. Serial No. 536,167.

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 Intermittent-Alarm Clock; and I do hereby declare the following, when taken in connection with the accompanying drawings and the numerals 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 constructed in accordance with my invention, with the dial removed and showing the front movement-plate. Fig. 2 a view in vertical section looking forward and showing the inner or rear face of the front movement-plate. Fig. 3 a view partly in plan and partly in horizontal section of the movement on an enlarged scale. Fig. 4 a detail view partly in plan and partly in section on the scale of Fig. 3, showing the manual push-rod in the position in which it leaves the alarm mechanism free to sound the alarm. Fig. 5 a corresponding view with the rod in its operative position. Fig. 6 a detached perspective view of the detent-lever. Fig. 7 a detached view in front elevation of the alarm-cam spring and its attached plate carrying the conical detent-operating cam.

My invention relates to an improvement in alarm-clocks of the class in which, to prevent the running down of the alarm-spring, the sounding of the alarm must be stopped by the user of the clock in such a way, however, as not to require the resetting of the alarm which will continue to be sounded at the same hour every day until the clock needs rewinding, the object being to greatly simplify the alarm mechanism of clocks of this class.

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 beveled at its front end and fixed upon a longitudinally movable push-rod 3 passing from rear to front through the rear and front movement plates 4, 5, in which it is supported. The said rod 3 projects 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 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. 3. The said stop-plug 3 coacts with a stop wire 13 reaching over and riding upon it, and carried by the verge-arbor 14 which also carries the verge 15, the hammer-wire 16 of the hammer 17, and the cut-out wire which coacts with a 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 bevel of the plug 2 and rests upon the cylindrical part thereof, whereby the verge-arbor 14 is sufficiently rocked to lock the verge 15 into the escapement-wheel 19 and thus arrest the running of the alarm-train which may be of any approved construction.

At its projecting forward end the push-rod 3 is furnished with a conical detent 20 for coaction with the detent-finger 21 of a detent-lever 22 bearing upon the front face of the front movement plate 5 and turning upon a pivot 23 therein. A spring 24 applied to the said plate 5 engages with a lug 25 upon the said lever 22 and exerts a constant effort to swing the same from right to left, and hence to engage its finger 21 with the flat rear face of the conical detent aforesaid. The said lever 22 is gradually swung from left to right against the tension of the spring 24, by the engagement of the beveled edge 26 of its operating-arm 27, by a cone-shaped cam 28 fixed upon the free right hand end of an operating-plate 29 fastened at its opposite end by rivets 30 to a flat spring 31 secured, as shown, by a screw 32, to the front movement plate 5. The said plate 29 aforesaid is crowded inward for the coaction of its cam 28 with the bevel 26 of the arm 27, by

the inner end 33 of the alarm-cam 34 carried by the alarm-wheel 35 which is loosely mounted upon the alarm-setting shaft 36 so as to be laterally movable thereupon. The said alarm-cam 34 coacts as usual with a cam-pin 37 in the outer end of the shaft 36 which is provided at its projecting rear end with a finger-button 38 by means of which the shaft 36 is rotated for setting the alarm, at which time an alarm-setting wheel 39 turns a pinion 40 loosely upon the hour-socket 41 which in turn turns loosely upon the center-shaft 42. The pinion aforesaid carries an alarm set pointer 43 concentric with the dial 44 which is the regular twelve-hour dial of the clock. The detent-lever 22 is moved from left to right once in twenty-four hours against the tension of the spring 24, by the inward movement of the cam 28 against the bevel 26 of the arm 27 of the lever, the cam 28 being moved inward by the gradual inward movement of the alarm-wheel 35 which is moved inward by the co-action of the alarm-cam 34 with the normally stationary pin 37 as the wheel 35 is driven by the alarm pinion 45 on the socket 41.

When the push-rod 3 is pushed from rear to front for the purpose of stopping the sounding of the alarm, the rod is caught and held in its operative position by the engagement of its conical detent 20 with the finger 21 of the lever 22 which at this time is momentarily swung from left to right by the beveled face of the detent. Now it is necessary to hold the push-rod 3 in its operative position until the time comes around for the alarm to be sounded again in due course by the operation of the time-train which, as has been seen, gradually swings the lever 22 from left to right, and hence in the direction of releasing the push-rod 3 by disengaging the finger 21 from the detent 20. When the arm 21 is in this way cleared from engagement with the detent 20, the same drops, so to speak, from the said arm upon what, for convenience, I shall call a warning-wire 46, mounted in a stud 47 carried by the lever 22 and passing upward through an elongated slot 48 formed in an arm 49 bent forward at a right angle from the upper end of the said lever. The detent is thus left in engagement with the warning-wire 46 and in readiness to be instantly released for the sounding of the alarm when the drop of the alarm-cam 34 is brought into registration with the pin 37 in the shaft 36, at which time the spring 31 will assert itself to swing the plate 29 outward and hence move the cam 28 out of engagement with the lever 22 which is then swung from right to left by its spring 24, this operation being closely analogous to the operation known as "warning" in all striking clocks. It will thus be seen that while the detent 20 is released from the arm 21 by the progressive action of the cam 28, the detent 20 is released from the warning-wire 46 by the sudden action of the spring 31 in swinging the cam 28 clear of the lever 22. In other words, the alarm is not finally let off by the progressive inward movement of the cam 28, but by the sudden outward displacement thereof. Normally the detent 20 will coact with the arm 21 of the lever 22 when the rod 3 is manually pushed forward for stopping the alarm after it has done its work. In case, however, the sounding of the alarm should take place when the lever 22 has been swung by the cam 28 from left to right so far as to carry the arm 21 beyond the range of the detent 20, the same will then engage with the yielding warning wire 44 which will spring to permit the detent 20 to be snapped over it, as it were. If the warning-wire 46 were not present for this purpose, and not made yielding, it might happen that in certain positions of the lever 22, the sounding of the alarm could not be stopped. Therefore the wire 46 while always discharging a warning function, if I may say so, at certain times discharges the initial detent function of the arm 21 of the lever 22.

It will be understood from the foregoing that after the alarm has been sounded and done its work, the user of the clock in order to prevent its alarm side from running down must get up and go to the clock and press the finger-button 10 so as to move the rod 3 from rear to front whereby the plug 2 will be pushed under the stop-wire 13, and cause the same to rock the arbor 14 and so stop the alarm train, which would be immediately started again by the action of the spring 11 in withdrawing the rod 3, and hence the plug 2 if it were not for the fact that the conical detent 20 were caught and the rod held at the limit of its forward excursion by the detent arm 21 of the detent lever 22, which is momentarily pushed aside for this engagement. The said lever 22 operates now for the best part of the ensuing twenty-four hours to hold the push-rod in its operative position as described, but meanwhile the time train is gradually swinging the lever 22 from left to right preparatory to its releasing the conical detent 20 carried by the rod. Shortly before the twenty-four hours expire the detent 20 is released from the arm 20 whereupon under the influence of its spring 11 the detent 20 drops from the arm 21 upon the warning-wire 46 whereby the rod 3 is 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 34 registers with the pin 37, leaving the spring 31 free to act to suddenly move the cam 28 outward away from the lever 22, which is

then quickly swung from left to right by its spring 24 so as to disengage the wire 46 from the detent 20 which, being thus entirely free, no longer interferes with the rearward movement of the rod 3, the plug 2 of which is thus 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 of its two forward positions and only moves into the limit of its rearward excursion once in twenty-four hours, and then remains in that position until the user pushes it forward again to the limit of its forward movement.

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 said stop-wire in arresting the alarm-mechanism, a detent on the push-rod, a detent-lever coacting with the detent for holding the push-rod in its operating position, and means operated by the time-mechanism for automatically moving the said lever into position for releasing the said detent preparatory to sounding an alarm.

2. 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 carried thereby and coacting with the stop-wire for arresting the alarm-mechanism, a conical detent on the push-rod, a pivotal detent-lever coacting with the said detent, and means operated by the time-mechanism for automatically moving the said lever into position for releasing the detent and hence the said rod, preparatory to the sounding of an alarm.

3. 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 carried by the said rod and coacting with the said wire for arresting the alarm-mechanism, a detent carried by the push-rod, a detent-lever coacting with the detent, a warning-wire carried by the detent-lever and also coacting with the detent, and means operated by the time-mechanism for automatically moving the said lever for its coaction and the coaction of its warning-wire, in the order named, with the detent for releasing the same and hence the rod, preparatory to the sounding of an alarm.

4. 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 carried thereby and coacting with the stop-wire for arresting the alarm-mechanism, a conical detent located upon the forward end of the push-rod, a detent-lever having a detent-finger coacting with the said conical detent, a warning-wire carried by the said detent-lever and also coacting with the said detent, a conical cam coacting with the detent-lever for automatically moving the same into position for letting off the alarm, and means controlled by the time-mechanism for gradually moving the said cam for twenty-four hours and releasing it for a quick clearance-movement of it at the expiration of that time.

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

WILSON E. PORTER.

Witnesses:
CLIFFORD J. REED,
GEORGE D. SEYMOUR.