No. 711,568. Patented Oct. 21, 1902.

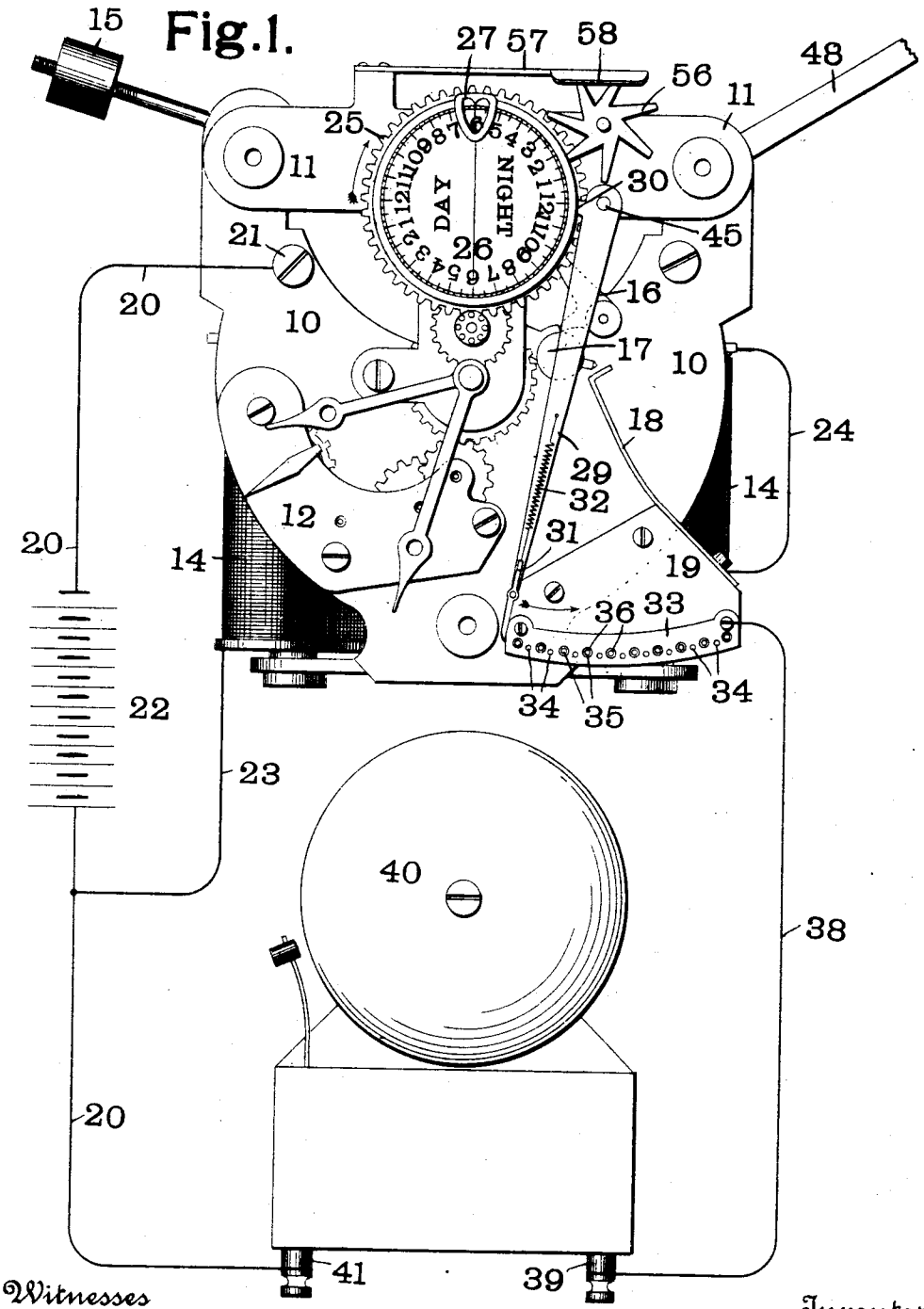
T. E. HEETER.

ELECTRIC ALARM CLOCK.

(Application filed Sept. 11, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.




Witnesses

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(No Model.) 3 Sheets—Sheet 2.

Fig.2.

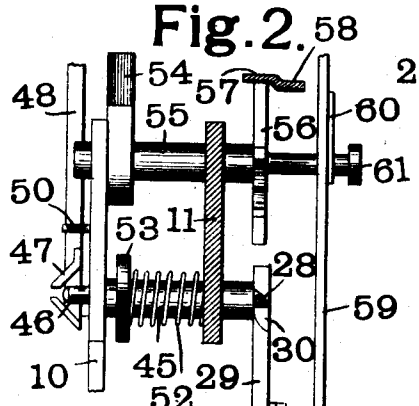



Fig.3.

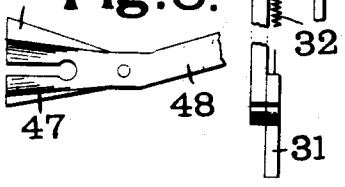



Fig.4.

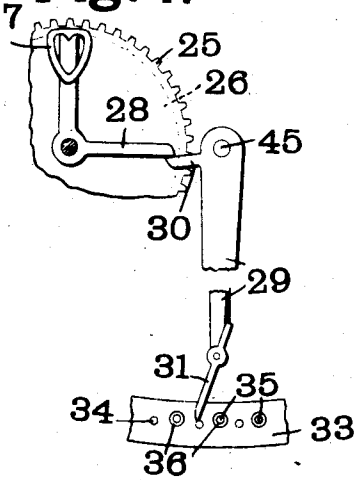



Fig.5.




Fig.6.

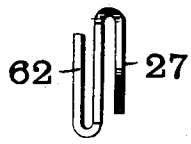



Fig.7.

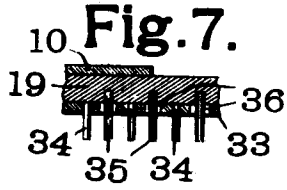
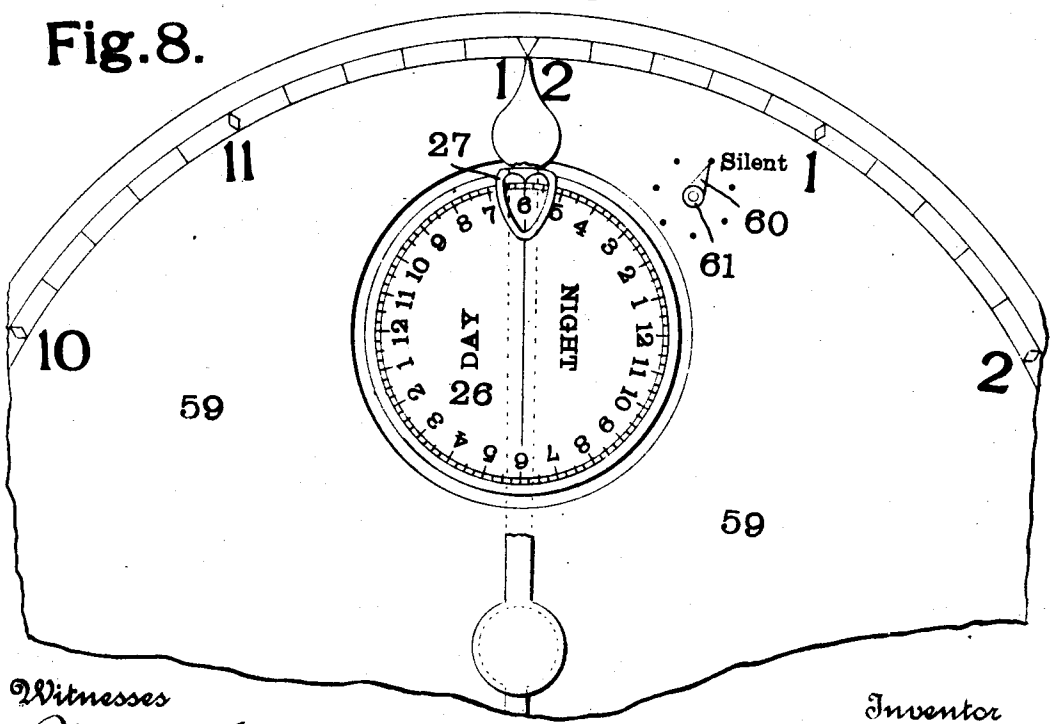



Fig.8.




Witnesses

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(Application filed Sept. 11, 1901.)

(No Model.) 3 Sheets—Sheet 3.

Fig.9.

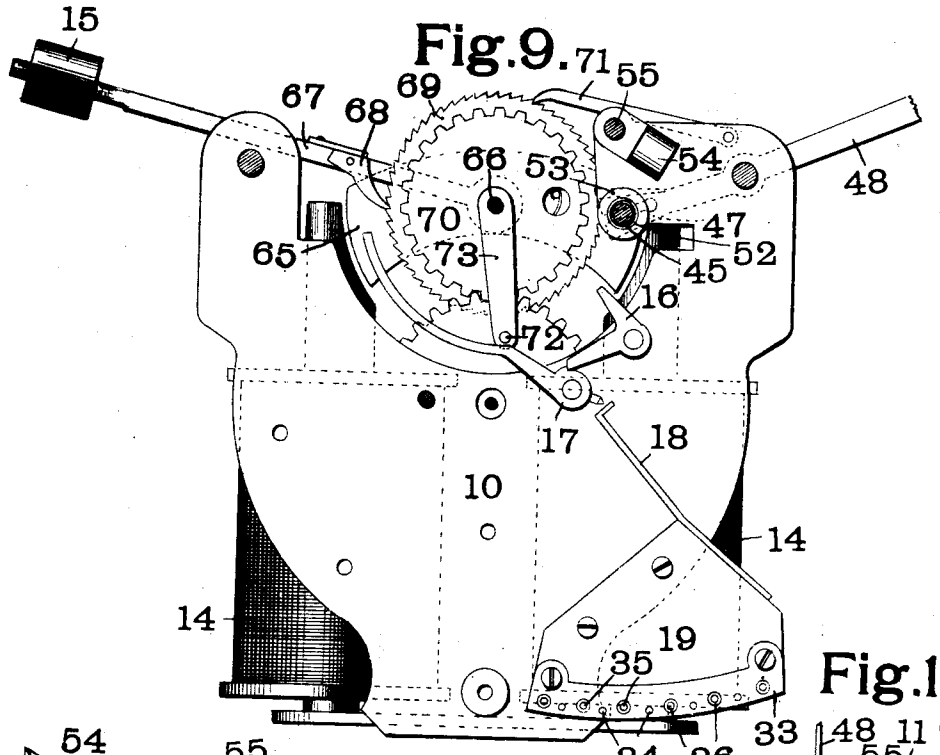



Fig.10.

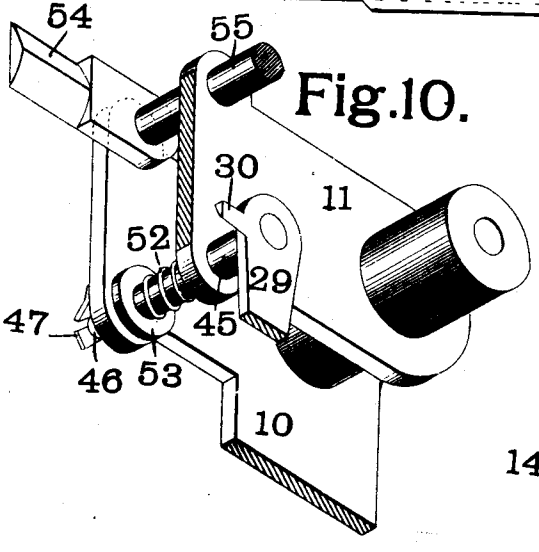
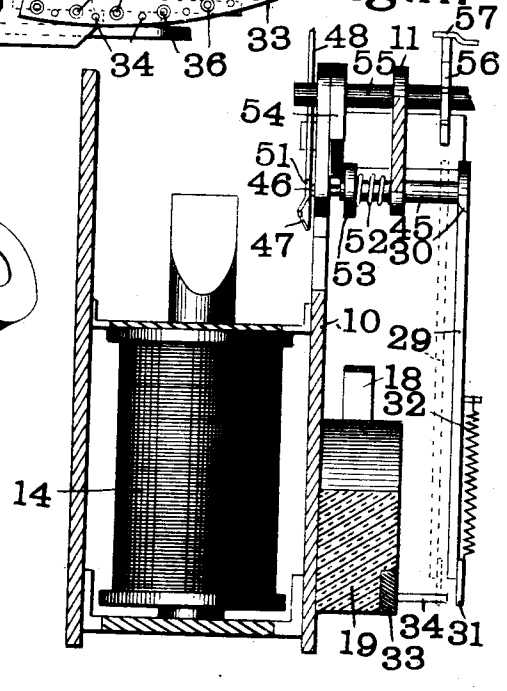



Fig.11.




Witnesses

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# UNITED STATES PATENT OFFICE.

THOMAS E. HEETER, OF ST. LOUIS, MISSOURI.

## ELECTRIC ALARM-CLOCK.

SPECIFICATION forming part of Letters Patent No. 711,568, dated October 21, 1902.

Application filed September 11, 1901. Serial No. 75,114. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS E. HEETER, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Electro-mechanical Clock, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to provide an electrically-operated alarm mechanism for clocks.

My alarm mechanism is preferably used in connection with a clock which is electrically wound; but it may be used with any suitable clock mechanism.

My invention consists in various novel features and details of construction, all of which are described in the following specification and pointed out in the claims affixed hereto.

In the accompanying drawings, which illustrate one form of clock made in accordance with my invention, Figure 1 is a front elevation, the dial being removed and the circuits being diagrammatically shown. Fig. 2 is an enlarged sectional view showing details of construction. Fig. 3 is an enlarged view of the release-cam. Fig. 4 is a front elevation showing the mechanism for actuating the contact-lever. Figs. 5 and 6 are a front view and side view, respectively, of a modified form of indicator. Fig. 7 is a sectional view showing the contact-pins. Fig. 8 is an enlarged view showing a portion of the clock-dial. Fig. 9 is a view similar to Fig. 1, but showing the plates 11 and 12 and the attached parts removed. Fig. 10 is an enlarged isometric projection showing details of construction, and Fig. 11 is a vertical section.

Like marks of reference refer to similar parts in the several views of the drawings.

10 represents the main plate of the frame of the clock. Between this plate 10 and two plates 11 and 12 is held the usual clock-train, which is not particularly described, as it forms no part of my invention.

Carried by the main plate 10 is an electro-magnet 14, the armature 65 of which is rigidly attached to the shaft 66, which is also rigidly attached to the arm 67, carrying the winding-weight 15. Carried on the arm 67 is a spring-actuated pawl 68, which engages with a ratchet-wheel 69, loosely mounted on the shaft 66. The ratchet-wheel 69 is connected with a spur-wheel 70, which communicates the motion of the arm 67 to the clock-train. The ratchet-wheel 69 is prevented from moving backward when the arm 67 is raised by means of a detent 71, pivoted to the plate 10.

16 is a detent adapted to be actuated to release a contact device 17 by means of a pin 72, carried on an arm 73, which is rigidly attached to the shaft 66. The contact device 17 is adapted to make contact with a contact-strip 18, carried by the insulating-block 19.

20 is a wire, which is connected at one end to the plate 10 by means of a screw 21. In this wire 20 is situated a suitable battery 22. The wire 20 is connected by means of a wire 23 with one terminal of the magnet 14, and the other terminal of the magnet 14 is connected by means of a wire 24 with the contact-strip 18.

All the above parts are old, and I do not claim the same except in combination with the parts hereinafter to be described.

Carried by the plate 11 is a spur-wheel 25, which is geared to the clock-train so as to make one revolution during each twenty-four hours.

26 is an indicator-dial, which is carried by the spur-wheel 25 and is adapted to rotate therewith. The indicator-dial 26 is divided into twenty-four parts, numbered from "1" to "12," in two sets, so as to indicate the hours of both day and night.

Mounted on the indicator-dial 26 is an indicator-clip 27, provided with an actuating-arm 28, adapted to actuate the contact-lever 29.

Pivotally mounted on the plate 11 is a contact-lever 29. The lever 29 is provided with a projection 30, adapted to make contact with the arm 28 of the indicator-clip.

Pivotally mounted on the lower end of the contact-lever 29 is a finger 31, which is normally held in the position shown in Fig. 1 by means of a spring 32.

Mounted on the insulating-block 19 is a metal segment 33, in which are secured a number of contact-pins 34. Between each two of the pins 34 is arranged an insulating-pin 35,

passing through an opening 36 in the segment 33 and secured in the insulating-block 19. This segment 33 is connected by means of a wire 38 with one terminal 39 of an electric bell 40. The other terminal 41 of the electric bell is connected to one end of the wire 20 above described. It will be evident that when the finger 31 is brought in contact with one of the pins 34, secured in the segment 33, the battery 22 will be placed in circuit with the bell 40 and ring the same.

The shaft 45, upon which the contact-lever 29 is rigidly mounted, passes through the plates 10 and 11 and is provided with a rounded end 46, Fig. 2. The shaft 45 is adapted to be forced forward by means of a V-shaped cam 47, which is pivoted to the plate 10 and provided with an actuating-lever 48, which projects outside of the clock-casing. The downward movement of the lever 48 is limited by means of a pin 50, against which the cam 47 is adapted to strike, and the upper part of said cam 47 is provided with a flat surface 51, which is adapted to permanently hold the shaft 45 in its forward position when the lever 48 is raised.

Surrounding the shaft 45, between the plates 10 and 11, is a coil-spring 52, which is adapted to normally hold the shaft 45 in its rear position and also to hold the contact-arm 29 in the position shown in Fig. 1 of the drawings. The shaft 45 is also provided with a collar 53, which is adapted to be acted upon by the cam 54 to force the said shaft 45 into its forward position. The cam 54 is carried on a shaft 55, passing through the plates 10 and 11. Mounted on the said shaft 55 in front of the plate 11 is a star-wheel 56, provided with seven points corresponding to the days of the week. This star-wheel 56 is adapted to be actuated by the arm 28, which also actuates the contact-lever 29. The star-wheel 56 is normally held against rotation by means of a spring 57, carried by the plate 11. The spring 57 is provided with an offset 58, which is adapted to engage the star-wheel when the same is drawn forward to move it out of the path of the actuating-arm 28. The shaft 55 is provided in front of the clock-dial 59 with an indicator 60 and also with a head 61, by means of which the shaft can be drawn forward to throw the wheel 56 out of the path of the arm 28.

In Figs. 5 and 6 is shown a modified form of the indicator-clip 27. This modified form of clip in place of being provided with the actuating-arm 28 standing at right angles with the clip is provided with an arm 62 which is parallel with the clip. I prefer to use the form of clip shown in Fig. 4 on an ordinary alarm-clock; but when the clock is intended to be used as a program-clock I prefer to use the form shown in Figs. 5 and 6, as it can be readily removed from the dial, and a number of clips can be used on the dial at one time, if desired.

The operation of my clock is as follows: The clip 27 is placed on the disk 26 at the point indicating the hour at which it is desired to have the alarm ring. The dial moves in the direction shown by arrow in Fig. 1. As soon as the actuating-arm 28 strikes the projection 30 on the contact-lever 29 the lower end of said lever will be forced toward the right in Fig. 1 until the finger 31 comes in contact with the first pin 35. The finger 31 will then be moved on its pivot until the lever has moved sufficiently to allow the finger to pass over the first point. It will then come in contact with one of the points 34 which is mounted in the segment 33. This will complete the circuit through the bell 40 and ring the same until the finger 31 has passed out of contact with the pin 34 and strikes another of the insulated pins 35. This operation will be repeated during the forward movement of the arm, thus alternately ringing the bell and throwing it out of circuit. As soon as the arm has passed beyond the pins 34 and 35 the movement of the actuating-arm 28 will take it out of contact with the projection 30 and allow the arm 29 to return to its normal position. In case it is desired to stop the ringing of the alarm before this has taken place the lever 48 can be pressed downwardly. This will cause the V-shaped cam 47 to force the shaft 45 forward, and thus carry the projection 30 out of contact with the arm 28. This releases the arm 29, so that it can return to its normal position. During each revolution of the indicating-dial 26 the arm 28 will feed the star-wheel 56 one tooth forward. At the end of each seventh day this will bring the cam 54 behind the disk 53, and thus force the shaft 55 forwardly, so that the arm 28 will not come in contact with the projection 30, and the alarm will remain silent on this day. The star-wheel 56 will usually be so arranged as to cause the clock to remain silent on Sunday; but if it is desired to have it silent on any other day the indicator-point 60 can be so moved as to cause the clock to be silent on any day of the week. If it is desired to throw the alarm mechanism entirely out of operation, the lever 48 is moved upwardly until the flat portion of the cam 47 bears upon the end 46. This will cause the shaft 45 to permanently remain forward, so that the projection 30 will be out of the path of the actuating-arm 28. In case it is desired to have the clock-alarm ring during the entire week the head 61 on the shaft 55 is drawn forward until the star-wheel 56 is in engagement with the offset 58 of the spring 57. The star-wheel will now be out of the path of the actuating-arm 28, and hence the cam 54 will not be moved to force the shaft 45 forward.

It will be noted that the lower side of the projection 30 is beveled and that the upper side of the arm 28 is correspondingly beveled, so that when the hands of the clock are turned backward to set the clock the arm 28 will simply force the contact-arm 29 forward as it passes the projection 30; otherwise the clock-

hands could not be turned backward, as the arm 28 would come in contact with the projection 30 and lock the clock against further movement.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an electromechanical clock, the combination with a clock-train, of a normally stationary contact-arm, means for actuating said arm from said clock-train at predetermined intervals, a plurality of contact-pins in the path of said arm, an electric bell in circuit with said contact arm and pins, whereby an intermittent alarm is sounded at predetermined intervals.

2. In an electromechanical clock, the combination with a clock-train, of a normally stationary contact-arm, an indicator-dial for actuating said contact-arm at predetermined intervals, a plurality of contact-pins in the path of said arm, and an electric bell in circuit with said contact arm and pins, whereby an intermittent alarm is sounded at predetermined intervals.

3. In an electromechanical clock, the combination with a clock-train, of an indicator-dial actuated by said clock-train, an actuating device carried by said dial, a contact-lever operated by said actuating device, a plurality of contact-pins, and an electric bell in circuit with said contact lever and pins.

4. In an electromechanical clock, the combination with a clock-train, of an indicator-dial actuated by said clock-train, a contact-arm actuated by said dial, a plurality of contact-pins, insulated pins arranged between said contact-pins, and an electric bell in circuit with said contact-arm and contact-pins.

5. In an electric clock, the combination with a clock-train, of an indicator-dial actuated by said clock-train, an actuating device carried by said dial, a contact-lever operated by said actuating device, a plurality of contact-pins, insulated pins arranged between said contact-pins, and an electric bell in circuit with said contact-lever and contact-pins.

6. In an electromechanical clock, the combination with a clock-train, of an indicator-dial actuated by said clock-train, a contact-arm actuated by said indicator-dial, a contact-finger pivotally mounted on said contact-arm, a plurality of contact-pins, insulated pins arranged between said contact-pins, and a bell in circuit with said contact-arm and contact-pins.

7. In an electromechanical clock, the combination with a clock-train, of an indicator-dial actuated by said clock-train, an actuating device carried by said dial, a contact-lever operated by said actuating device, a contact-finger pivotally mounted on said lever, a plurality of contact-pins, insulated pins arranged between said contact-pins, and an electric bell in circuit with said contact-lever and contact-pins.

8. In an electromechanical clock, the combination with a clock-train, of an indicator-dial actuated by said train, an actuating device carried by said dial, an electric bell, a contact-lever operated by said actuating device to close the circuit through said bell, and manually-operated means for throwing said contact-lever out of the path of said actuating device.

9. In an electromechanical clock, the combination with a clock-train, of an indicator-dial actuated by said clock-train, an electric bell, a contact-arm operated by said dial to close the circuit through said bell, and means for automatically moving said arm at predetermined intervals to prevent its being operated by said dial.

10. In an electromechanical clock, the combination with a clock-train, of an indicator-dial actuated by said train, an actuating device carried by said dial, an electric bell, a contact-lever operated by said actuating device to close the circuit through said bell, and means for automatically throwing said contact-lever out of the path of said actuating device at predetermined intervals.

11. In an electromechanical clock, the combination with a clock-train, of an indicator-dial actuated by said train, an actuating device carried by said dial, an electric bell, a contact-lever operated by said actuating device to close the circuit through said bell, manually-operated means for throwing said lever out of the path of said actuating device, and automatic means for throwing said lever out of the path of said actuating device at predetermined intervals.

12. In an electromechanical clock, the combination with a clock-train, of an indicator-dial actuated by said train, an actuating device carried by said dial, an electric bell, a contact-lever operated by said actuating device to close the circuit through said bell, a star-wheel also operated by said actuating device, and a cam carried by said star-wheel for throwing said contact-lever out of the path of said actuating device at predetermined intervals.

In testimony whereof I have hereunto set my hand and affixed my seal in the presence of the two subscribing witnesses.

THOS. E. HEETER. [L. S.]

Witnesses:
JAMES H. BRYSON,
W. A. ALEXANDER.