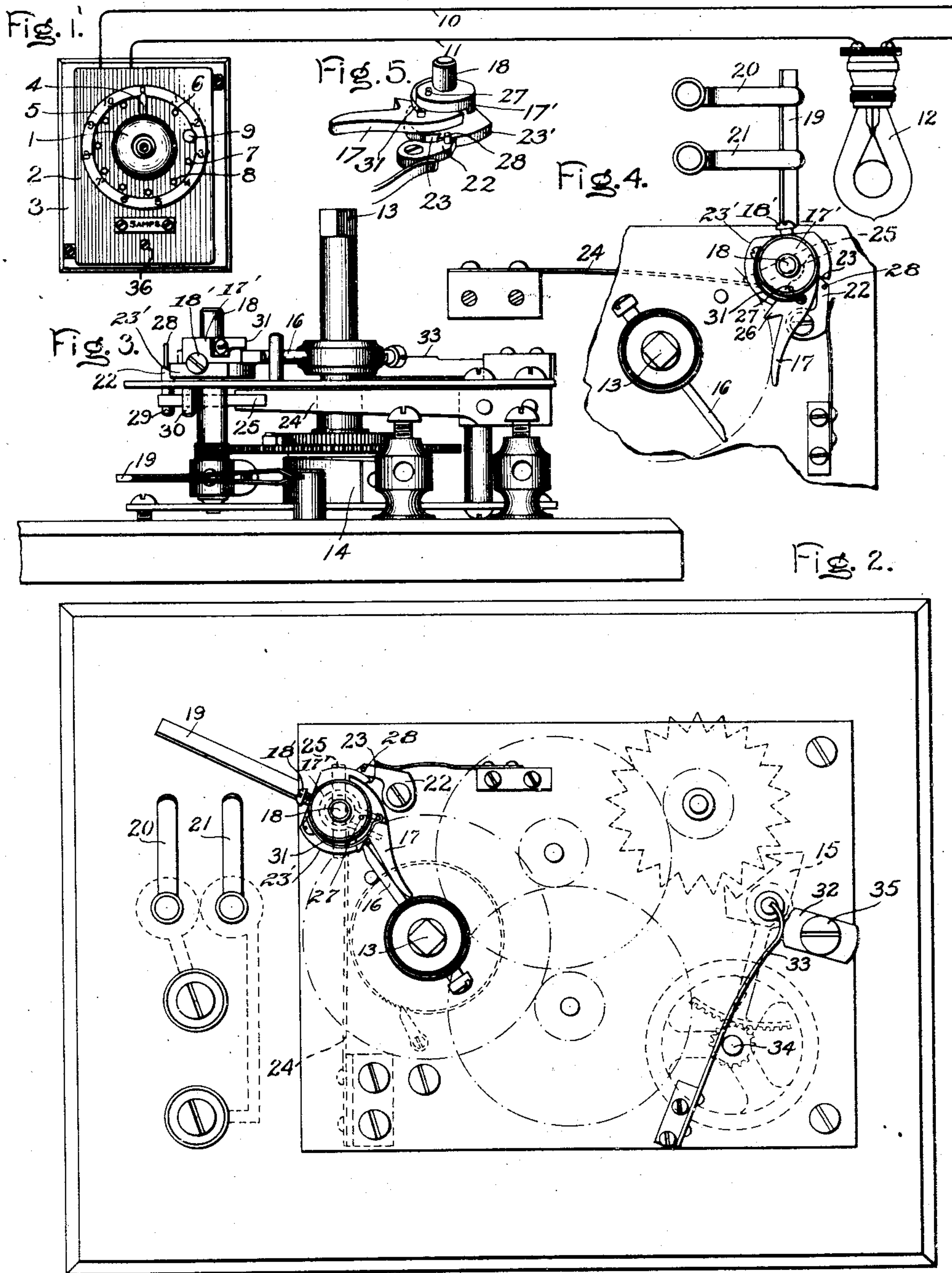


No. 832,568.

PATENTED OCT. 2, 1906.

W. S. ANDREWS.
ELECTRIC TIME SWITCH.
APPLICATION FILED DEC. 15, 1903.



Witnesses
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UNITED STATES PATENT OFFICE.

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TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC TIME-SWITCH.

No. 832,568.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed December 15, 1903. Serial No. 185,292.

To all whom it may concern:

Be it known that I, WILLIAM SYMES ANDREWS, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Time-Switches, of which the following is a specification.

My invention relates to time-switches or similarly-controlled devices, and comprises certain improvements whereby the switch or other device may be manually closed and after the expiration of a predetermined adjustable time interval may be automatically opened.

The novel features which are characteristic of my invention I have pointed out with particularity in the appended claims. The invention itself, however, will be better understood by reference to the following description, taken in connection with the accompanying drawings, in which—

Figure 1 shows my improved time-switch in side elevation. Fig. 2 is a side elevation of the switch with the cover removed, while Figs. 3, 4, and 5 are views representing in detail this switch-tripping mechanism.

My improved time-switch is particularly useful in connection with the control of electric circuits which are of such nature that the circuit when in use is closed only temporarily. Thus, for instance, for household purposes incandescent or other electric lights are frequently used for illuminating basements, closets, pantries, or the like, in which case the light is only required for a short time. After turning on such a light the operator through a lapse of memory very frequently fails to turn out the light. As a controlling device for circuits of this character my time-switch is particularly valuable and convenient.

In Fig. 1 the time-switch is represented on the left-hand side of the drawings. Except for the operating-handle 1 the mechanism of the switch is concealed in the box-cover 2, secured to the base-plate 3. The operating-handle is provided with a pointer 4, moving over a graduated scale 5. At different points around the graduated scale holes—such as at 6, 7, 8, &c.—are drilled, into any one of which a stop or plug 9 may be inserted. These holes are drilled in the path of the pointer 4, so that the plug or stop 9 when in-

serted in any one of the holes serves to limit the movement of the pointer, and therefore the switch-handle. This switch-handle when turned from its zero position first closes a switch located, for example, in the circuit 10 11 of the incandescent light 12 and then winds a clock mechanism. When the switch arm or handle is released, the clock mechanism commences a return movement to its starting position. At about the time the starting position is reached the previously-closed switch is automatically tripped. The interval elapsing between the closing and the opening of the switch depends upon the angle through which the pointer 4 is rotated. The interval is therefore adjustable at the pleasure of the operator.

The handle 1 is mounted upon the squared end 13 of a shaft which projects through the top of the box 2. This shaft is the winding-shaft of an ordinary clockwork mechanism. (Shown in Figs. 2 and 3.) The main driving-spring of the clockwork mechanism is represented at 14. This spring is wound up in the usual manner and operates, through intermediate gears (represented in dotted lines in Fig. 2,) to run an ordinary escapement, such as at 15. The shaft 13 is turned to the right to wind up the clock mechanism and as the mechanism runs down slowly returns to its original position. In being wound up the shaft 13 causes the projecting arm 16 carried thereby to engage an arm 17 and by swinging one end of this around in the arc of a circle to cause a rotation of the shaft 18 through a corresponding angle. This result is produced because of the pivoted connection between the arm 17 and an annular collar or sleeve mounted on the shaft 18, as will be better understood by reference to Fig. 4, in which the arm 17 is shown as mounted on the pivot 27, secured parallel to shaft 18 in the annular collar or sleeve 17', which is rigidly locked to the shaft 18 by a set-screw 18'. Immediately below this annular collar 17' and integral therewith is an irregularly-shaped flange 23', having on one side an abutment or notch 23, with which a pawl 22 engages for purposes hereinafter set forth. With the construction above described it will be understood that the movement imparted to arm 17 by arm 16 will tend to produce rotation of the outer end of arm 17 about pivot 27, thus moving the inner end of arm 17 through a slot in the annular collar

17' (see Fig. 5) and bringing it up against shaft 18, so that it acts as a lever to cause rotation of that shaft. As this shaft 18 is rotated a switch-blade 19 carried thereby is moved into engagement with the fixed contacts 20 and 21, constituting terminals of the circuit 10 and 11. The circuit is thus closed. As this switch-arm moves into engagement with the contacts 20 and 21 the spring-actuated pawl 22 snaps into position behind the wall or abutment 23, carried by shaft 18, and the leaf-spring 24, acting upon a cross-arm 25, carried by the shaft 18, tends to return the shaft to its original position, but is prevented from doing so by the pawl or detent 22, which in the closed position of the switch occupies the position shown in Fig. 4. After the switch has been set the pointer 4 gradually returns to its original position and in doing so engages a projecting finger 26, forming a part of the pivoted member 17. This engagement causes said member to rotate about its pivot 27 and into engagement with a small upwardly-projecting pin 28 on the end of the pawl 22. The pawl is thus forced out of engagement with the abutment 23, and thereby allows the shaft 18 to rotate and open the switch. Stops 29 and 30 are adapted to be engaged by a portion of the cross-arm 25 and serve thus to limit the rotation of the shaft 18. A spring 31, secured to the annular collar 17', tends to hold the arm 17 in the position indicated in Fig. 4, so that it will be in proper position to receive arm 16 when that part is turned back by the clock mechanism.

In cases where it is desired for any reason that the switch should be closed permanently the clockwork may be locked from movement so that when once wound by the rotation of the switch-handle it will not unwind and return the switch-handle to its original position. A device consisting of a cam 32 performs this function. This cam normally holds a spring 33 out of engagement with the shaft 34 of the balance-wheel. When the cam is turned, it allows this spring to press on the shaft 34, and thus prevents rotation of the latter. The shaft 35 of the cam projects into an opening in the cover 2 and is provided with a groove so as to simulate a screw-head, as shown at 36. By turning the screw-head so that the groove moves away from its up-and-down position the clockwork mechanism may be locked at will. This locking device possesses the advantage that its purpose or even existence would not be suspected by a person unacquainted with the mechanism. Such a person would be unable to keep the switch closed for a longer time than that for which the mechanism is adjusted, or, in other words, would be unable to keep the light burning for a greater length of time than that indicated by the switch-dial.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of an electric switch, a clock or similar escapement mechanism, a handle for winding the clock, means operated by the handle for closing said switch when the mechanism is wound, automatic means for returning said handle to its original position, and means for tripping a switch when said handle returns to its original position.

2. The combination of a switch-arm, a spring for urging the arm in one direction, a detent for holding the arm after it has been moved in opposition to said spring, manually-operated means movable through a variable distance for closing said switch, and automatic means for opening said switch after an interval determined by the amount of movement of said manually-operated means.

3. The combination of an electric switch or other device to be controlled, a clockwork mechanism, a handle for simultaneously winding the clock mechanism and moving said switch or device in one direction, and means controlled by the unwinding of said clock mechanism for moving said switch or device and said handle in the opposite direction.

4. The combination of an electric switch or other device to be controlled, a clockwork mechanism, means for simultaneously winding the clockwork mechanism and moving said switch or device in one direction, an adjustable stop for limiting the motion of the winding means, and means controlled by the unwinding of said clockwork mechanism for moving said switch or device in the opposite direction.

5. In combination, a pivoted switch-arm, a spring for urging said arm to open position, a clockwork mechanism, a handle, operative connections between said handle and both said switch and said mechanism whereby the movement of said handle positively shifts the switch to closed position in opposition to said spring and simultaneously winds said mechanism, a latch for holding the switch closed, and means controlled by the unwinding of said mechanism for tripping said latch and for returning said handle to its original position.

6. In combination, a pivoted switch-arm, a spring for urging said arm to open position, a clockwork mechanism, a handle, operative connections between said handle and both said switch and said mechanism whereby the movement of said handle positively shifts the switch to closed position in opposition to the spring and simultaneously winds the mechanism, said connections being arranged to disconnect said mechanism from said switch when the switch is closed, a latch for holding the switch closed, and means controlled by the unwinding of said mechanism for tripping said latch and for returning said handle to its original position.

7. In combination, an electric switch, a
clockwork mechanism, a handle; operative
connections between said handle and both
said switch and said mechanism whereby the
5 movement of said handle closes the switch
simultaneously and winds said mechanism,
said connections being arranged to discon-
nect said mechanism from said switch when
said switch is closed, and means controlled

by the unwinding of said clock mechanism 10
for opening said switch and returning said
handle to its original position.

In witness whereof I have hereunto set my
hand this 14th day of December, 1903.

WILLIAM SYMES ANDREWS.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.