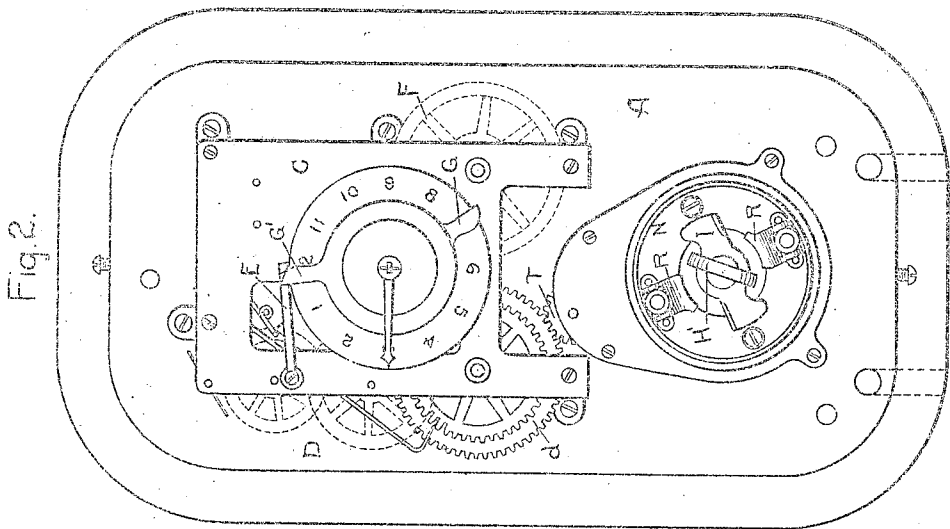
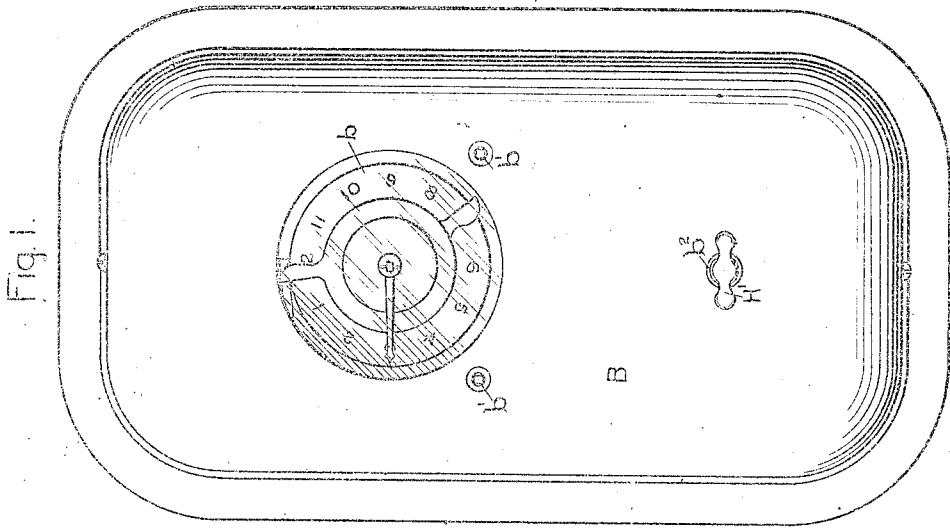


No. 826,331.

PATENTED JULY 17, 1906.

C. E. HARTHAN.
ELECTRIC TIME SWITCH.
APPLICATION FILED MAR. 14, 1902.

2 SHEETS—SHEET 1.



Witnesses.

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C. E. HARTMAN.
ELECTRIC TIME SWITCH.
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Fig. 3

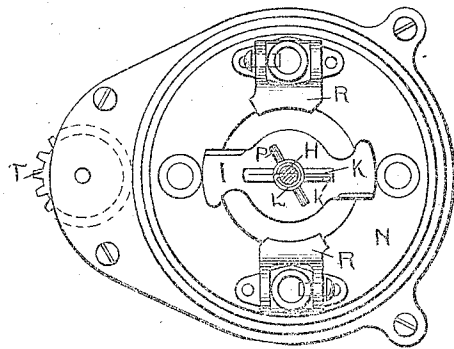


Fig. 5.

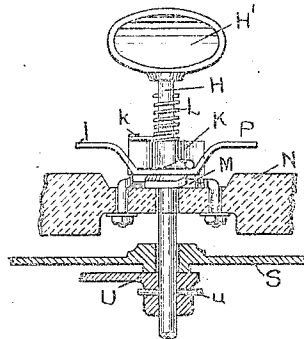


Fig. 4.

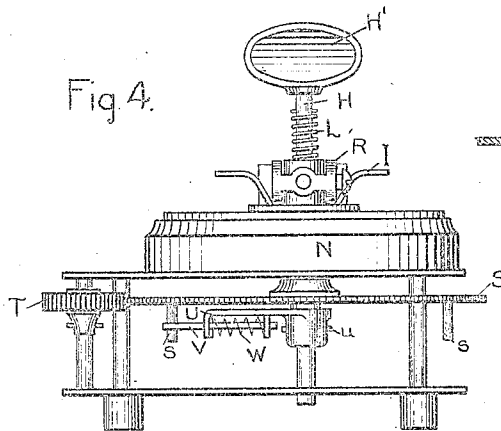
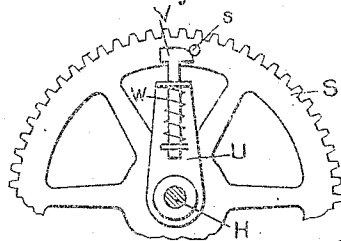


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES E. HARTHAN, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC TIME-SWITCH.

No. 826,331.

Specification of Letters Patent.

Patented July 17, 1906.

Application filed March 14, 1902. Serial No. 93,244.

To all whom it may concern:

Be it known that I, CHARLES E. HARTHAN, a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Automatic Time-Switches, of which the following is a specification.

This invention relates to switches for electric circuits, and especially lighting-circuits in which it is frequently desirable to close and open the circuit at predetermined hours of the day—as, for example, in lighting a show-window for certain hours in the evening. Many such devices have been proposed heretofore; but my invention possesses simplicity, can be manufactured at low cost, and permits the switch to be controlled by hand as well as by the time mechanism without disconnection therefrom.

I use an ordinary striking-clock mechanism and a single-pole double-break snap-switch of any preferred type. On the spindle of the switch is loosely mounted a gear-wheel carrying an abutment. Secured to the spindle is an arm provided with a dog which will be engaged by the abutment when the wheel overtakes the arm, but which will yield and permit the arm to pass the abutment when the arm overtakes the abutment. An idle pinion connects the gear-wheel with the striking mechanism of the clock. When this mechanism is tripped, the gear-wheel is revolved and actuates the switch. By having two independently-adjustable tripping-fingers for the striking mechanism the switch can be actuated twice in every twenty-four hours. Thus, for instance, it may be set to close the lighting-circuit in a show-window at seven o'clock in the evening and to open it at midnight. The switch can be opened or closed by hand at any time without interfering with the clock, because the yielding dog permits the arm to be carried past the abutment in case the latter should be overtaken by the arm when the spindle is turned by hand.

In the accompanying drawings, Figure 1 is a front elevation of my improved time-switch. Fig. 2 is a similar view with the casing removed. Fig. 3 is a front view of the switch alone. Fig. 4 is an edge view of the same. Fig. 5 is a sectional view of the quick-

action portion of the switch, and Fig. 6 is a rear view of a portion of the gear-wheel and the cooperating arm and dog.

The mechanism is secured to a suitable back plate A and protected by a removable casing B, in which is a glazed opening *b*, key-holes *b'*, and a hole *b''* for the switch-spindle.

The time mechanism is an ordinary striking-clock C, whose striking-train D is controlled by the usual trip-lever E. The hour-hand arbor of the time-train F carries two independently-adjustable tripping-fingers G G'; which can be set to operate the lever at predetermined hours.

The switch is preferably of the single-pole double-break snap variety of any desired construction. The one shown is like that described and claimed in the application of H. R. Sargent, Serial No. 86,980, filed March 19, 1900, and has a spindle H, on which is loosely mounted the double contact-arm I. A locking-pawl K slides longitudinally on the spindle and is forced by a spring L into engagement with a ratchet-plate M, secured to the base N of the switch. A cross-pin P in the spindle operates on cam-surfaces on the lower end of the pawl when the spindle is rotated and lifts the pawl out of the teeth of the ratchet. The spring L has one end secured to the spindle and the other end bearing against a lug *k* on the pawl, so that the rotation of the spindle puts the spring under tension and gives the pawl a quick quarter-rotation when lifted out of the ratchet-plate. The pawl passes through a slot in the switch-arm I, so that the latter is moved with the pawl and closes and opens the circuit at the stationary contacts R, to which the line-terminals are secured. A handle H' enables the spindle to be turned by hand when desired.

On the spindle H is loosely sleeved a gear-wheel S, on which are two pins *s* or other abutments. This wheel is geared with the striking-train D, preferably through an idle pinion T, meshing with a wheel *d*, which rotates once in twenty-four hours. In order to communicate the motion of the gear-wheel to the switch-spindle, the latter has an arm U rigidly secured to it, as by a pin *u*, and carrying a dog V, which lies in the path of the pins *s*. When one of the pins overtakes

the dog, the arm and the spindle will be carried along with it, and thus the switch will be operated.

In order to allow the switch to be turned on and off by hand, the dog is made to yield and pass by the pin when the arm overtakes the pin, as will frequently be the case when the spindle is turned by hand. This is most easily accomplished in the manner shown in Figs. 4 and 6, the dog being radially slidable on the arm and held normally projected into the path of the pin by a spring W. The back of the dog is beveled to permit it to be forced inwardly when brought against the pin.

It will be noted that the operation of the switch entails no work upon the time-train of the clock, so that its accuracy as a time-keeper is not impaired. The time-train simply carries the tripping-fingers which trip the striking-train, and the actuating of the switch is accomplished by the spring which drives the striking-train.

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

1. The combination with a switch capable of manual operation, of a gear-wheel loose on its spindle and carrying an abutment, an arm fixed on the spindle and adapted to en-

gage with said abutment, a spring-driven train for driving the gear-wheel, and a time mechanism carrying tripping devices to release the train at stated times.

2. The combination with a switch capable of manual operation, of a gear-wheel loose on its spindle and carrying an abutment, an arm fixed on the spindle and carrying a dog yielding in one direction and adapted to engage the abutment, a spring-driven train in mesh with the gear-wheel, and a time mechanism for tripping the train at stated times.

3. The combination with a switch capable of manual operation, of a gear-wheel loose on its spindle and carrying a pin, an arm fixed on the spindle, a radially-movable dog on said arm, having one side beveled, a spring for keeping said dog normally in the path of the pin, a spring-driven train in mesh with the gear-wheel, and a time mechanism carrying tripping devices to release said train at stated times.

In witness whereof I have hereunto set my hand this 12th day of March, 1902.

CHARLES E. HARTMAN.

Witnesses:

DUGALD MCK. MCKILLOP,
JOHN A. McMANUS.