

No. 811,589.

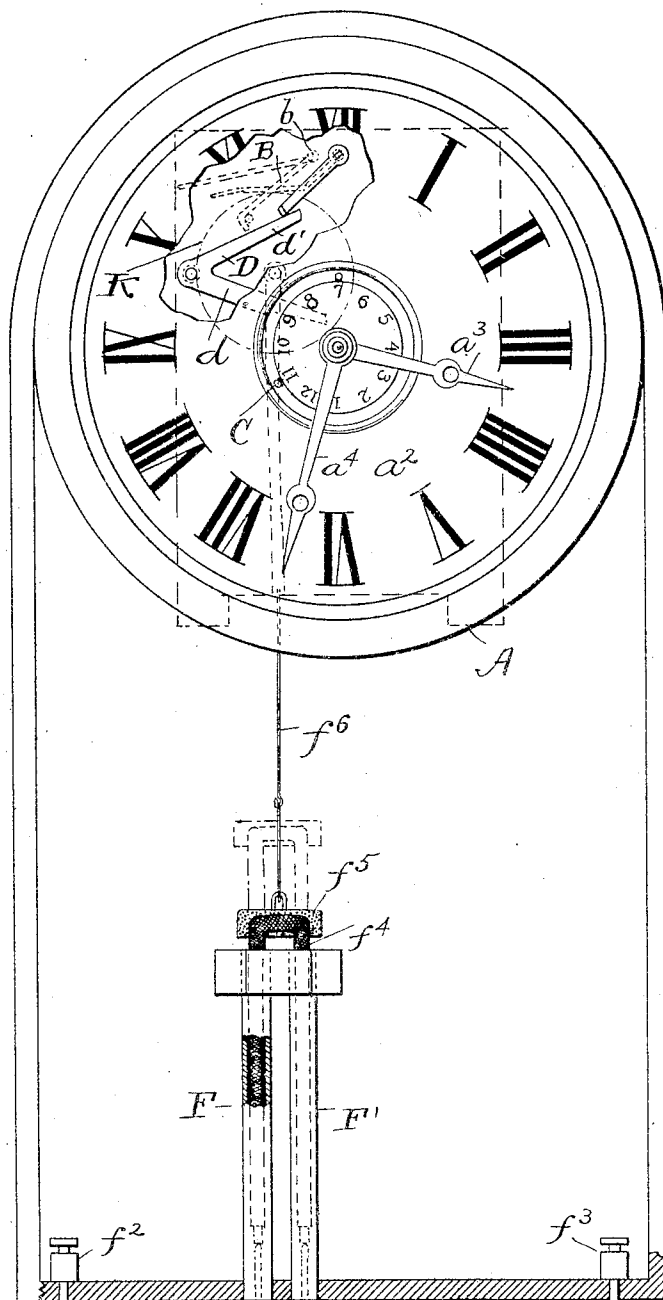
PATENTED FEB. 6, 1906.

C. O. SHATTO & L. S. DENISON.

ELECTRIC TIME SWITCH.

APPLICATION FILED JUNE 18, 1903.

2 SHEETS—SHEET 1.



Witnesses.

E. B. Gilchrist

N. L. Greenawald

Fig. 1.

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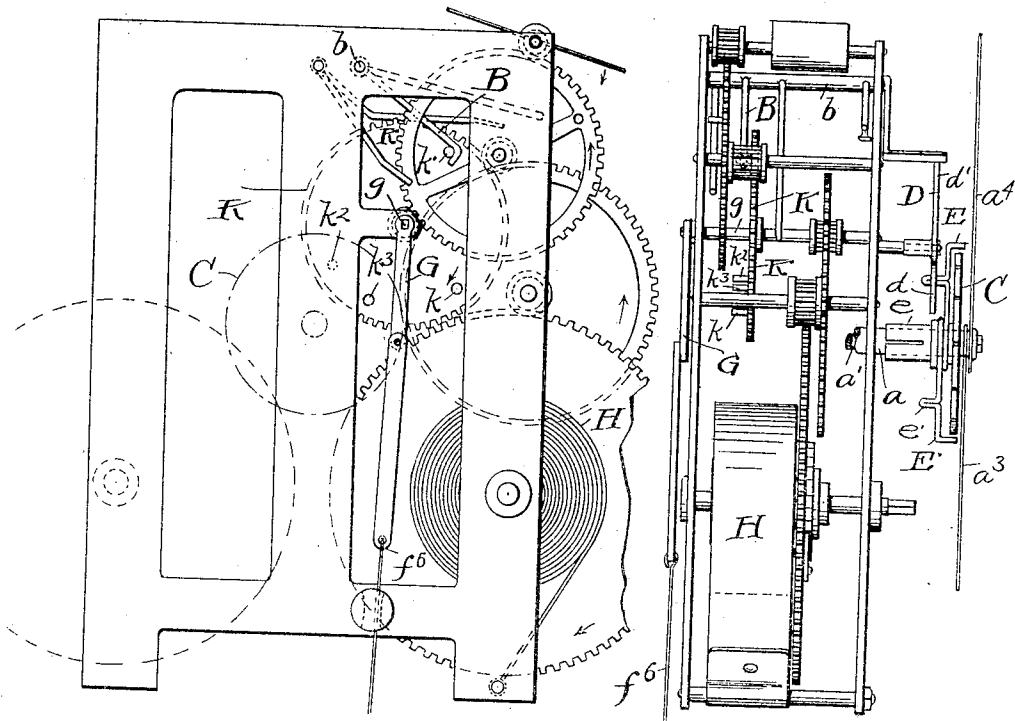


Fig. 2.

Fig. 3.

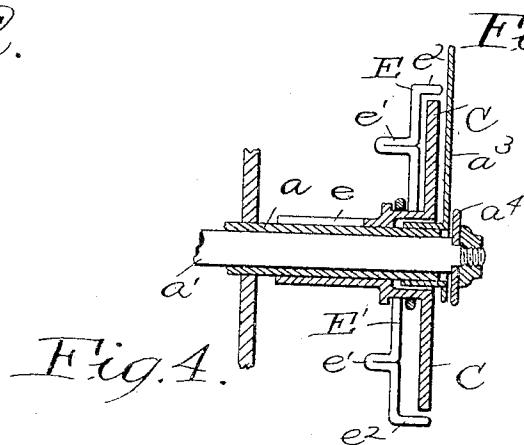


Fig. 4.

Witnesses.
E. B. Gilchrist
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UNITED STATES PATENT OFFICE.

CLYDE O. SHATTO, OF SHARON, PENNSYLVANIA, AND LINUS S. DENISON,
OF RAVENNA, OHIO.

ELECTRIC TIME-SWITCH.

No. 811,589.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed June 18, 1903. Serial No. 162,055.

To all whom it may concern:

Be it known that we, CLYDE O. SHATTO, residing at Sharon, in the county of Mercer and State of Pennsylvania, and LINUS S. DENISON, residing at Ravenna, in the county of Portage and State of Ohio, citizens of the United States, have invented a certain new and useful Improvement in Electric Time-Switches, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

Our invention relates to novel means whereby electric circuits may be automatically closed and opened at predetermined hours, said invention being particularly useful for automatically turning electric circuits on and off.

The invention may be briefly summarized as consisting in the construction and combination of parts hereinafter described, reference being had to the accompanying drawings, description, and claims.

Referring to the drawings, Figure 1 is a front elevation of a clock provided with our improved mechanism. Fig. 2 is a rear elevation of the switch-operating mechanism. Fig. 3 is a side elevation of the parts shown in Fig. 2, and Fig. 4 is a detail view of the adjustable trippers and immediately-associated parts.

The apparatus includes an ordinary clock A, having the usual hour-hand spindle *a*, minute-hand spindle *a'*, dial *a²*, and the hour and minute hands *a³* *a⁴*, respectively.

The switch employed consists of mercury-cups F and F' and a conducting-yoke *f⁴*, which is adapted to be lowered, so that its legs shall respectively dip into the mercury in said cups or raised to remove said legs from the mercury. The cups are respectively connected by wires *f f'* with the binding-posts *f²* *f³*, to which the terminals of the electric circuit to be controlled are also secured. The upper end of this yoke, which for convenience may be secured to the cross-head *f⁵*, is connected by a flexible connection *f⁶* with a crank-arm G, which is fast to a rotatable shaft *g*. This shaft is connected with a motor—as, for example, the spring H—through a suitable train of gearing and is always subject to the force of said motor to rotate it. This shaft is, however, normally restrained from rotation and is permitted to rotate only part of a revolution periodically at predetermined hours. The mechanism shown for ro-

tating this shaft and for stopping the rotation thereof is substantially the striking mechanism usually employed in a clock. A stop-wheel K is attached to the shaft *g*, and projecting from it parallel with the axis of the shaft are a number of stop-pins *k k' k² k³*, the number of such pins being equal to the number of times it is desired to stop said wheel during one revolution. Four of such pins are employed, because as the mechanism is arranged it is intended that the switch shall be opened and closed only once in twenty-four hours and at predetermined times—as, for example, at seven o'clock p. m. and eleven o'clock p. m., respectively. To produce this action, the yoke *f⁴* must be lowered into the mercury at seven o'clock p. m., so as to close the switch, and must be lifted out of said mercury at eleven o'clock p. m., so as to open the switch. It is not desired, however, to have the switch closed at seven o'clock in the morning, and therefore the movement of the wheel K and crank-shaft *g* at seven o'clock and at eleven o'clock in the morning is only a slight movement which is made while the switch is open and is not sufficient to close it. This wheel K is held against rotation by a detent B, attached to a rock-shaft *b*, which detent normally occupies a position where it will engage one of the stop-pins thereon. The mechanism shown by which this is raised at the proper time includes two trippers E E', which are adjustably secured to the hour-spindle *a* of the clock. These trippers in the specific construction shown include a spring-clasp *e*, which tightly embraces the hour-spindle, rearwardly-projecting tripping-fingers *e'*, and a pointer *e²*, through the assistance of which these trippers may be set with respect to the tripper-dial C, which is also attached to the hour-spindle and bears upon its face the indicating-figures from "1" to "12," respectively, arranged upon said dial in the reverse direction to the similar figures on the clock-dial. The mechanism upon which these trippers operate to produce the desired results consists of a pivoted lever D, having one arm *d*, which lies in the path of the tripper-fingers, and it also includes mechanism operated by this lever whereby the detent *d* is for the instant raised to release the wheel K. This intermediate mechanism shown consists of a crank-arm attached to a rock-shaft, the crank-arm being in engagement

with one arm d' of the lever D. The shaft itself is a part of the ordinary striking mechanism of a clock, as is also all of the mechanism intermediate of said shaft and the detent, wherefore it is not thought necessary to describe it.

The operation of the device is as follows: For example, we will assume that it is the desire of the operator to have the electric circuit turned on at seven o'clock p. m. and to have it turned off at eleven o'clock p. m. The trippers are turned so that the pointers thereof are set at "7" and "11," respectively, on the dial C. At seven o'clock one of the tripper-fingers will rock the lever D, with the result of temporarily withdrawing the detent from one pin k , whereupon the shaft g turns a part of a revolution and until the next pin k' engages with the detent. This results in lowering the yoke f^1 into the mercury-cups, whereby the circuit is closed. At eleven o'clock the other tripper engages with and rocks the lever D, wherefore the shaft g is again released and allowed to turn a part of a revolution until the detent engages with the pin k^2 , which results in withdrawing the yoke from the cups, thereby opening the circuit. Now at seven a. m. the tripper again rocks the lever D, whereby the shaft g is again released; but this time it turns only a very small part of a revolution, the distance between two pins k^2 k^3 , and the result is merely a slight lifting of the yoke, and at eleven a. m. the detent is again tripped; but the ensuing rotation of the shaft g until the detent again engages with the pin k is only sufficient to permit the yoke to descend a very short distance—not enough to carry it into the mercury.

Having described our invention, we claim—

1. The combination with the usual clock-face, hands and mechanism for operating the same, of an extra dial marked with a single series of numbers from 1 to 12, a switch adapted to be operated by the clockwork, a detent for controlling the same, fingers for tripping said detent, which fingers stand in proximity to the edge of said extra dial, and mechanism for controlling the actuation of said switch on certain predetermined engagements of said detent, whereby the extra dial may be marked corresponding to a clock-face and still each finger actuate the switch only once in twenty-four hours, substantially as described.

2. The combination with a clock having the usual face, hands and mechanism for driving it, of a small central dial carried by the hour-hand sleeve and numbered near its edge continuously from 1 to 12, said numbering extending entirely around the dial, a pair of fingers adjustably carried by said hour-hand sleeve and located behind said small dial but extending beyond the edge thereof, a switch and mechanism for operating the same, and means whereby said fingers actuate said operating mechanism to close or open the circuit only on certain predetermined engagements of said fingers, substantially as described.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

CLYDE O. SHATTO.
LINUS S. DENISON.

Witnesses:

A. W. WILLIAMS,
K. H. BUNDEL.