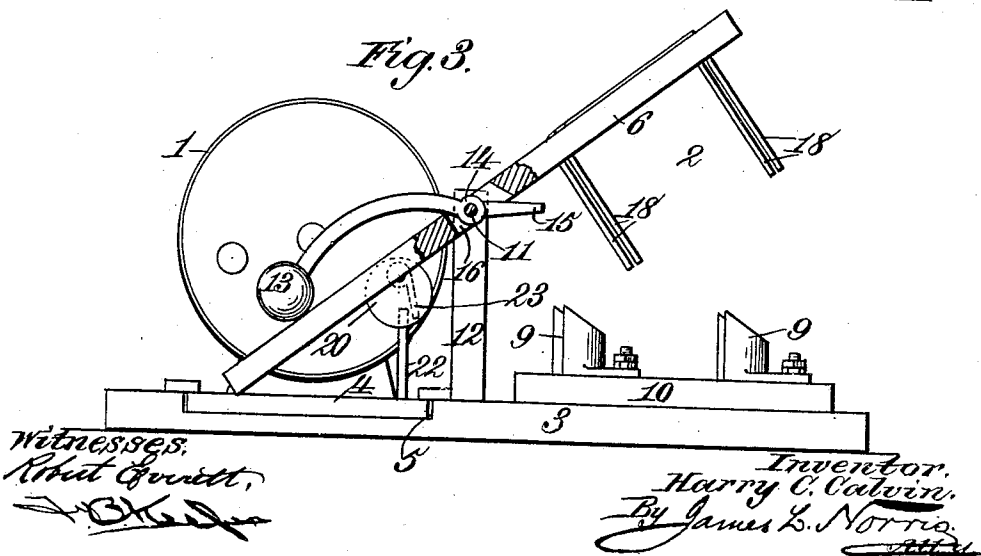
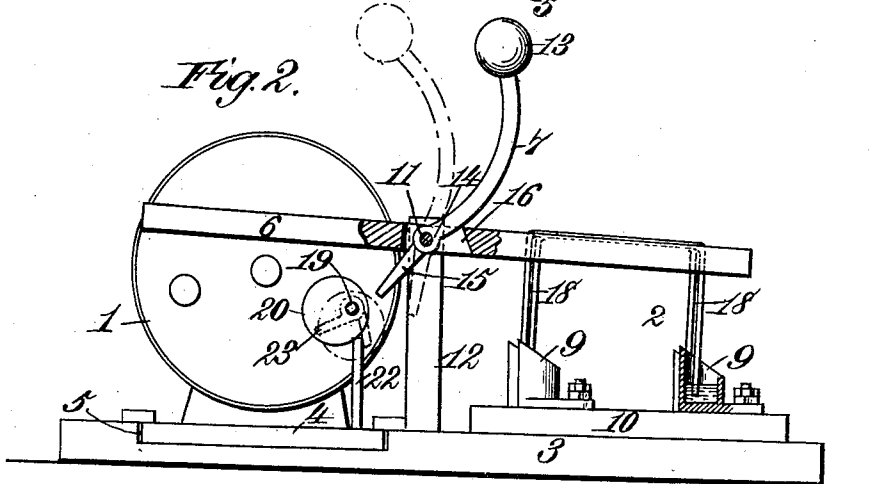
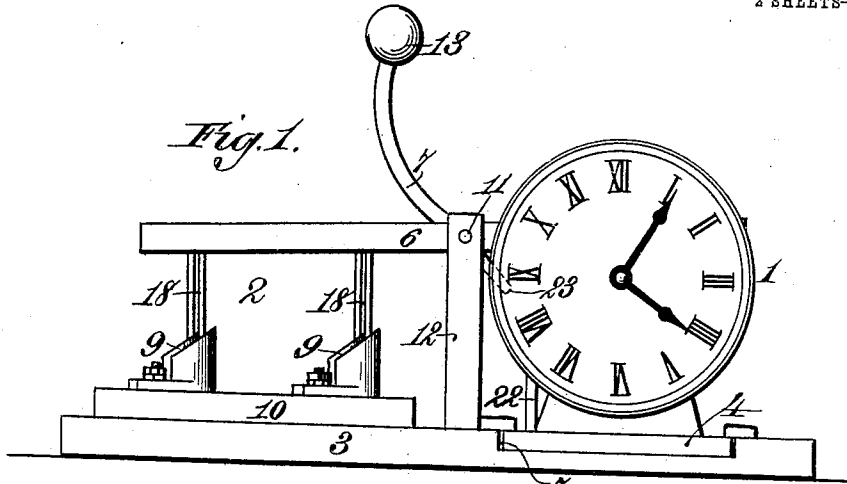


H. C. CALVIN.
AUTOMATIC TIME SWITCH.
APPLICATION FILED APR. 3, 1909.

970,882.

Patented Sept. 20, 1910.

2 SHEETS—SHEET 1.

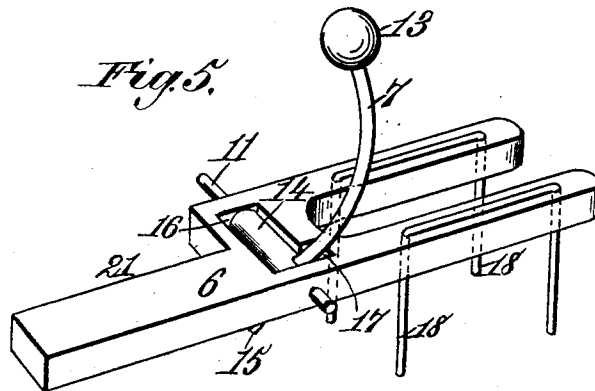
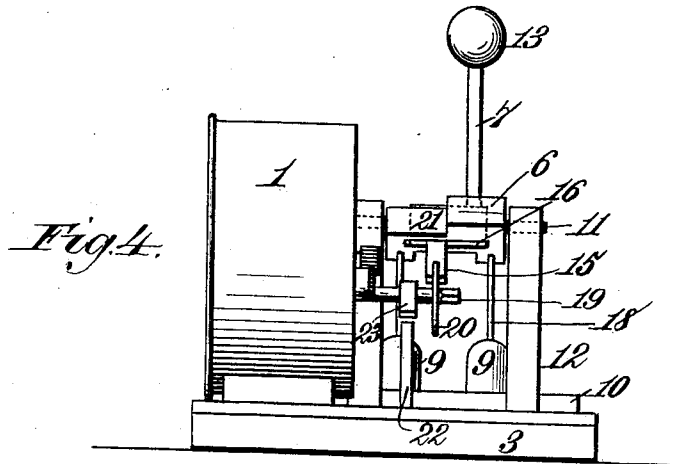


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2 SHEETS—SHEET 2.



Witnesses:
 Robert G. Smith,
[Signature]

Inventor:
 Harry C. Calvin,
 By *[Signature]*
 James L. Norris,
 Att'y.

UNITED STATES PATENT OFFICE.

HARRY C. CALVIN, OF DOTHAN, ALABAMA.

AUTOMATIC TIME-SWITCH.

970,882.

Specification of Letters Patent. Patented Sept. 20, 1910.

Application filed April 3, 1909. Serial No. 487,627.

To all whom it may concern:

Be it known that I, HARRY C. CALVIN, a citizen of the United States, residing at Dothan, in the county of Houston and State of Alabama, have invented new and useful Improvements in Automatic Time-Switches, of which the following is a specification.

This invention relates to new and useful improvements in automatic time switches and it has more particular reference to a mechanism of that type in which a clock driven element is employed to mechanically cause the operation of the switch arm.

In connection with a structure of the above type, the invention aims as a primary object to provide a device which shall be quick and certain in its operation and accordingly the invention comprises more particularly a momentum element which is associated with the switch arm and which has an initial movement independently thereof in order to acquire a certain degree of momentum by reason of which the switch arm is efficiently operated.

The invention aims as a further object to provide a switch mechanism which may be employed in connection with any clock structure which has an alarm spring shaft. The clock controlled element is driven by this shaft which rotates at any desired time and said element directly operates the aforesaid momentum element which in turn causes the operative movement of the switch arm.

In the accompanying drawings I have illustrated a preferred and advantageous embodiment of the invention and the structure therein shown is to be regarded as merely exemplary and not obligatory.

In the said drawings: Figure 1 is a front elevation of the clock and a side elevation of the switch mechanism. Fig. 2 is an elevation looking at the opposite side of the mechanism from that seen in Fig. 1, parts being shown in section. Fig. 3 is an elevation similar to Fig. 2 but illustrating the positions which the parts assume when the switch is operated. Fig. 4 is an end elevation of the switch mechanism, the clock appearing in side elevation, and Fig. 5 is a detail perspective view of the switch arm and the momentum element associated therewith.

Similar characters of reference refer to corresponding parts throughout the several views.

The essential elements of the device are a clock, as 1, a switch mechanism, as 2, and a base, as 3, upon which the clock and the switch mechanism are mounted. The clock preferably is secured to a plate, as 4, which slides into and out of a recess, as 5, in the base 3. The switch mechanism 2 comprises a switch arm, as 6, a momentum element, as 7, and a contact device. The contact device comprises a plurality of mercury cups or tubes, as 9, which are mounted upon a plate, as 10, the latter being secured directly to the base 3. The switch arm 6 is pivoted midway of its length as by a pin 11, between a pair of vertical supporting posts 12. The momentum element 7 comprises a curved arm which at its upper end is provided with a weight, as 13, and which is formed with a sleeve, as 14, loosely surrounding the pin 11. The arm 7 is formed with an extension, as 15, which projects downwardly from the sleeve 14. The switch arm 6 is provided with a transverse slot, as 16, in which the sleeve 14 is disposed, the slot 16 having at one end a forward extension, as 17, to allow for the necessary movement of the arm 7. The switch arm 6 is provided at its forward end with depending contact fingers, as 18, for engagement in the several cups 9.

The alarm spring shaft of the clock is indicated by the numeral 19 and in the embodiment shown, carries an eccentrically disposed disk, as 20, which turns with the shaft 19 when the latter is rotated and engages the extension 15, causing thereby a movement of the arm 7 sufficient to pass the center of gravity, at which time the arm, by virtue of its weighted end 13, drops with considerable force, engaging the rearwardly projecting portion of the arm 6 and moving the latter on its pivot so as to lift the fingers 18 out of the cups 9 and to effect a breaking of the circuit. In order that the disk 20 may not interfere with the movement of the arm 6, the rearwardly projecting portion of the latter is cut away, as at 21, to afford a space for the disk 20. This arrangement is clearly shown in Figs. 4 and 5.

Means are provided for limiting the oper-

ative movement of the disk 20 to a revolution or a fraction thereof in order that it may not be necessary to wholly rewind the alarm mechanism after each operation of the switch and also to prevent the disk 20 from having continued movement to engage the arm 6 and cause any oscillation thereof, such as might tend to reestablish the circuit. Such means preferably comprises a vertical post, as 22, which is secured upon the plate 4, and a finger, as 23, which is fast upon the shaft 19 and which engages the post 22 after the disk 20 has operated the arm 7 in the manner shown in Figs. 2 and 3.

The operation will be readily apparent from the foregoing description. The alarm mechanism is set to operate in the usual manner and the switch arm is positioned with its contact fingers 18 in the cups 9, thereby establishing a circuit and with the arm 7 forwardly of its center of gravity, as shown in Figs. 1 and 2, at which time the extension 15 abuts the rear wall of the slot 16 as a stop. When the alarm mechanism operates the shaft 19 turns and therewith the disk 20 is turned and engages the extension 15 of the arm 7. Such engagement operates said arm in the manner explained. The arm 7 during its initial movement independently of the arm 6, acquires considerable momentum and consequently when the weighted end 13 strikes the rearwardly projecting portion of the arm 6, the latter is quickly and positively moved on its pivot to the position shown in Fig. 3, the fingers 18 leaving the cups 9 and thereby breaking the circuit. In resetting the switch the arms 6 and 7 are positioned, as shown in Figs. 1 and 2, and the shaft 19 is turned backward to the extent of a partial revolution.

The invention is especially applicable for use in connection with lighting systems in which the circuit is to be broken at a certain hour but the invention may also be used as a matter of course wherever its use will prove advantageous. While the arrangement, as shown, is intended to break a circuit which is normally closed, it is obvious that with slight modifications or re-arrangements of the present parts such as are within the purview of a mechanic, the device may be operated to close a circuit which is normally open.

The invention, while efficiently carrying out the function stated, also retains the ad-

vantageous incidents of simplicity and inexpensiveness.

Having fully described my invention, I claim:

1. In a switch of the type set forth, in combination, a base plate, a clock supported at one end thereof, contacts provided at the other end thereof, an upstanding post arranged between the clock and the contacts, a switch arm pivoted between its ends to the post and having one end provided with means to engage the contacts and having a free end portion disposed adjacent the clock, a momentum element pivoted coincidentally with the switch arm and having a depending portion projecting beyond its pivot, and a cam secured to a shaft of the clock and arranged to engage the depending portion and to produce thereby an operative movement of the momentum element, the latter in turn engaging the free end portion of the switch arm and producing an operative movement thereof.

2. In a switch of the type set forth, in combination, a base plate, a clock supported at one end thereof, contacts provided at the other end thereof, an upstanding post arranged between the clock and the contacts, a switch arm pivoted between its ends to the post and having one end provided with means to engage the contacts and having a free end portion disposed adjacent the clock, the switch arm having a transverse slot and the pivot of the switch arm passing through the slot, a momentum element having a sleeve disposed in the slot and surrounding the pivot of the switch arm and having an extension depending from the sleeve, the switch arm normally having a horizontal position and the momentum element normally having an upright position and bearing against a wall of the slot, and a cam secured to a shaft of the clock and arranged to engage the extension and to produce thereby an operative movement of the momentum element, the latter in turn engaging the free end portion of the switch arm and producing an operative movement thereof.

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

HARRY C. CALVIN.

Witnesses:

JOHN C. HARRISON,
S. J. ESPY.