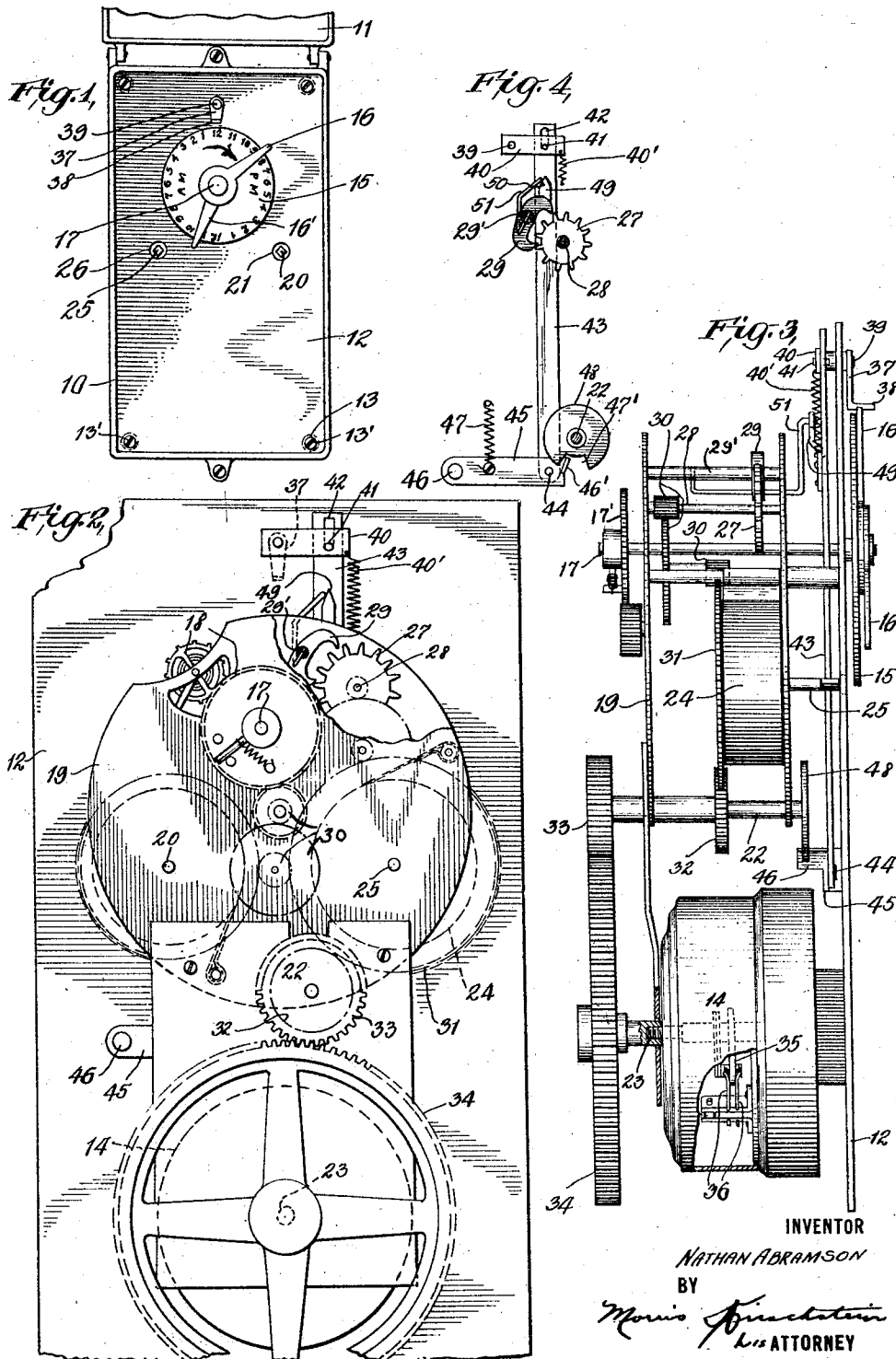


N. ABRAMSON.
ELECTRIC TIME SWITCH.
APPLICATION FILED JULY 30, 1920.

1,420,902.

Patented June 27, 1922.



INVENTOR

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NATHAN ABRAMSON, OF NEW YORK, N. Y.

ELECTRIC TIME SWITCH.

1,420,902.

Specification of Letters Patent. Patented June 27, 1922.

Application filed July 30, 1920. Serial No. 400,197.

To all whom it may concern:

Be it known that NATHAN ABRAMSON, citizen of the United States, and resident of the city of New York, in the county of Kings
5 and State of New York, has invented certain new and useful Improvements in Electric Time Switches, of which the following is a specification.

This invention relates to automatic electric time switches for automatically opening or closing electric circuits at a desired predetermined time. One of the objects thereof is to provide a device of the above type characterized by simplicity and cheapness of
10 construction and efficiency of operation in a high degree.

Another object is to provide a device of the above type having a snap switch with rotatable switch elements, a motor mechanism and means for direct power transmission from the latter to the switch shaft to
20 insure positive and effective operation.

A further object is to provide a unitary portable time switch of the type described, neat and compact in construction and having a reduced number of parts securely assembled and readily accessible.

Other objects will be in part obvious and in part hereinafter pointed out.

Certain features herein shown and described are shown, described and claimed in my co-pending application Serial No. 397,815, filed in the United States Patent
30 Office July 21st, 1920, and accordingly are not claimed herein.

With the above exception, the invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the apparatus hereinafter described and the scope of the application of which
40 will be indicated in the following claims.

In the accompanying drawings in which is shown one of various possible illustrative
45 embodiments of this invention,

Fig. 1 is a front elevational view showing the automatic time switch in position in the casing;

Fig. 2 is a rear elevational view of an automatic time switch embodying this invention showing the mechanism as assembled;

Fig. 3 is an end elevational view thereof; and

55 Fig. 4 is a detailed vertical elevational view of the trip mechanism for releasing

the actuating mechanism for the switch and of the brake mechanism for locking same against operation.

Referring in detail to the drawing, 10 indicates a casing having a hinged cover 11 within which is mounted the electric time switch in the manner hereinafter described. The casing and cover may be of the type known in the electrical art as the common
60 "knock-out" box used for enclosing switches and the like. 12 indicates an attaching plate or panel having openings 13 for screws 13' whereby the panel may be secured to the back of the casing as shown in Fig. 1. This panel serves as the support on which the mechanism and parts of the device are assembled in co-operative relation to each
65 other. The time switch comprises means for setting the apparatus for operation at desired predetermined times, the snap switch 14 and means for operating the same. The setting means comprises a clock dial 15 and the clock hands 16, 16' all mounted on a shaft 17 adapted to be operated by means of
70 a motor mechanism such as suitable clock work, some parts of which are shown at 18 and which is compactly assembled and held on the plate 12 and a rear plate 19. The clock work for the dial is wound in the
75 usual manner by means of a stem 20, an opening 21 being provided in the plate for the winding key. Means is provided for actuating the switch operating mechanism. It will be understood that the function of
80 the clock work mentioned is merely to give the gear 17' on the shaft 17, and the dial and hands, all of which are frictionally mounted on, but rotatable relatively to said shaft, one complete rotation in twenty-four
85 hours, there being no permanent or rigid operative connection between said clock work and the remaining mechanism. This actuating means comprises a motor mechanism adapted to drive the main shaft 22
90 whereby motion is transmitted to shaft 23 on which are mounted the rotatable switch blades. The motor mechanism of the said actuating means comprises preferably clock work consisting of a main spring 24 wound
95 by means of the stem 25 through the opening 26 in the plate 12. The usual power transmission actuated by the unwinding of the spring is provided and comprises an escapement gear 27 mounted on the shaft 28 and
100 the oscillating pawl 29 mounted on shaft 29' in operative relation to the escapement

gear. When the escapement pawl 29 is released for operation as will be described more fully hereinafter, the escapement gear and the mechanism 30 connecting said gear to the spring gear 31 is permitted to rotate under the influence of the spring 24. Said spring gear 31 meshes with and drives the gear 32 on the shaft 22. The motion is thus transmitted to a gear 33 carried on the end of the shaft 22 and thence to the larger drive gear 34 mounted on the shaft 23 thus rotating the switch blades 35 in and out of the spring jaws 36 from "off" into "on" position or vice versa.

Means is provided for being automatically acted on to release and to set into operation the actuating mechanism for the switch operating device at desired times. For this purpose a trip member 37 having a projection 38 is pivoted on a shaft 39 on the front face of the plate 12 in operative relation to the clock dial and hands. Pivoted on the rear of shaft 39 is the arm 40 which carries a stud 41 adapted to operate within the slot 42 in a vertically movable arm 43. A restoring spring 40' is provided for the arm 40 as shown. The arm 43 is secured at its lower end as at 44 to a link 45 which is pivoted as at 46 and is adapted to be depressed against the action of the spring 47. The link 45 carries or is formed on its free end with a brake member 46' adapted to drop into a slot 47' in the disc 48 mounted on a shaft 22. Secured to the arm 43 is a cam member 49 having an oblique cam face 50 for the spring cam follower 51 secured on the oscillating escapement pawl shaft 29'. The gears 31 and 32 and disc 48 are so dimensioned as to permit disc 48 to make one complete revolution during a quarter turn of the shaft 23, necessary to operate the switch blades.

The operation of the device will now be clear. After the dial has been manually rotated relatively to the shaft 17 into the proper position to synchronize the device with the time of day, as is explained in my previous application hereinbefore mentioned, the dial hands are set as desired. For the purpose of illustration it will be assumed that the time switch is to be used in connection with some electrical device which it is desired to turn on at 11 a. m. and to turn off at 8:30 p. m. As the shaft 17 is rotated by the clock work, and as the dial rotates in the direction of the arrow, hand 16' will at 11 a. m. as shown in Fig. 1 abut against the projection 38 and push the trip member 37 causing the arm 40 to move carrying with it the stud 41 which acts against the lower wall of the slot 42 and thus pushes arm 43 down together with the arm 40 against the action of spring 47. As arm 43 moves down it causes link 45 to rotate downward about its pivotal point 46 and against

the spring 47, at the same time moving the brake member 46 out of the slot 47' in disc 48. In its motion downward, cam face 50 of the cam 49 is moved down so as to cause the spring 51 to release the oscillating pawl 29, thus permitting the spring 24 to operate the escapement gear 27 through the train of gears 30 and transmitting motion through the gear 31 to shaft 22, and thence to shaft 23 giving the latter a quarter turn and operating the switch blades. When the operation of the switch blades has been completed, the slot 47 is again disposed opposite the brake member 46 which is returned thereinto by spring 47 and the arm 43 moving up and the arm 40 being restored to normal position by spring 40' and the trip member brought back into its normal position in readiness for the next tripping operation. The motion of arm 43 upward has carried with it cam face 50 so as to place this spring 51 in position to lock the escapement pawl as will be readily understood.

It will be noted that all the mechanism is compactly assembled on the rear of plate 12 between said plate and the rear plate 19, while on the outer face of the panel are mounted only the clock dial and hands and the trip member so that the interior mechanism is not exposed when the box is opened, while the necessary elements are accessible for setting the device as desired.

As various possible embodiments might be made of the above invention and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

It will thus be seen that there is provided apparatus in which the several objects of this invention are achieved and which is well adapted to meet the most severe conditions of hard practical use.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. In an electric time switch, a clock driven shaft, adjustable hands and a dial on said shaft, a trip member arranged in the path of said hands, a shaft carrying said trip member, a lever pivoted on said trip shaft, a link connected to said lever, a switch mechanism, a vibratory escapement pawl for controlling said switch mechanism, and means on said link for releasing said pawl for vibratory movement on the tripping of said trip member.

2. In an electric time switch, a trip member, clock driven means for tripping said member, a lever operatively connected to said member and arranged to be partly rotated on the tripping of said member, a second spring pulled lever pivoted near one of

its ends, a cam follower on the other of its
ends, a link connecting said levers, a switch
operating mechanism, a vibratory escape-
ment pawl for controlling said switch mech-
anism, a rod carried by said pawl, means on
5 said link for engaging said rod to release
said pawl for vibratory movement on the
rotation of said first lever, and a cam disc
having a notch therein adapted to receive

said cam follower after said cam has made 10
one revolution for raising said link, reset-
ting said tripping member and locking said
escapement mechanism.

Signed at New York city, in the county of
New York and State of New York this 27th 15
day of July, A. D. 1920.

NATHAN ABRAMSON.