

W. C. BLUNDELL.
ELECTRIC TIME SWITCH MECHANISM.
APPLICATION FILED JULY 12, 1907.

945,013.

Patented Jan. 4, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

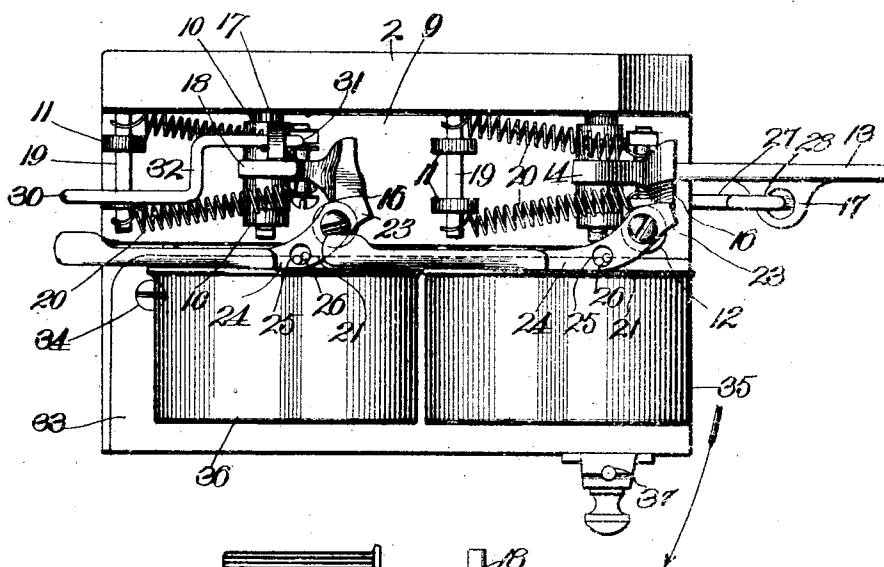
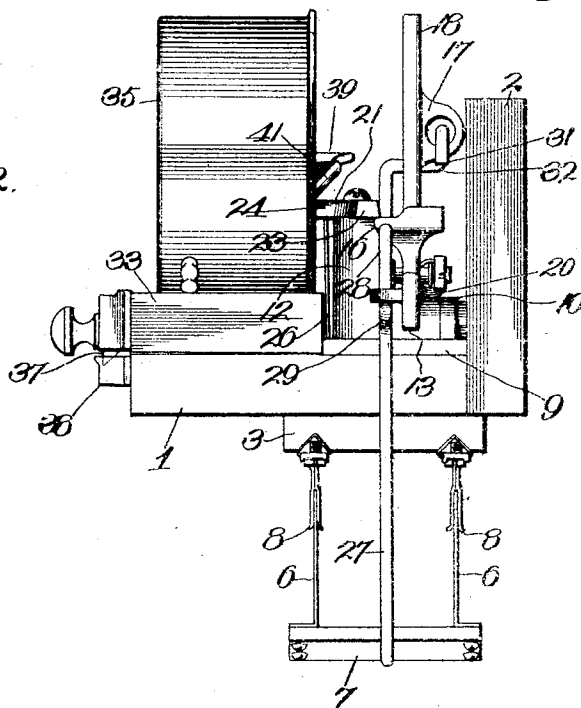


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

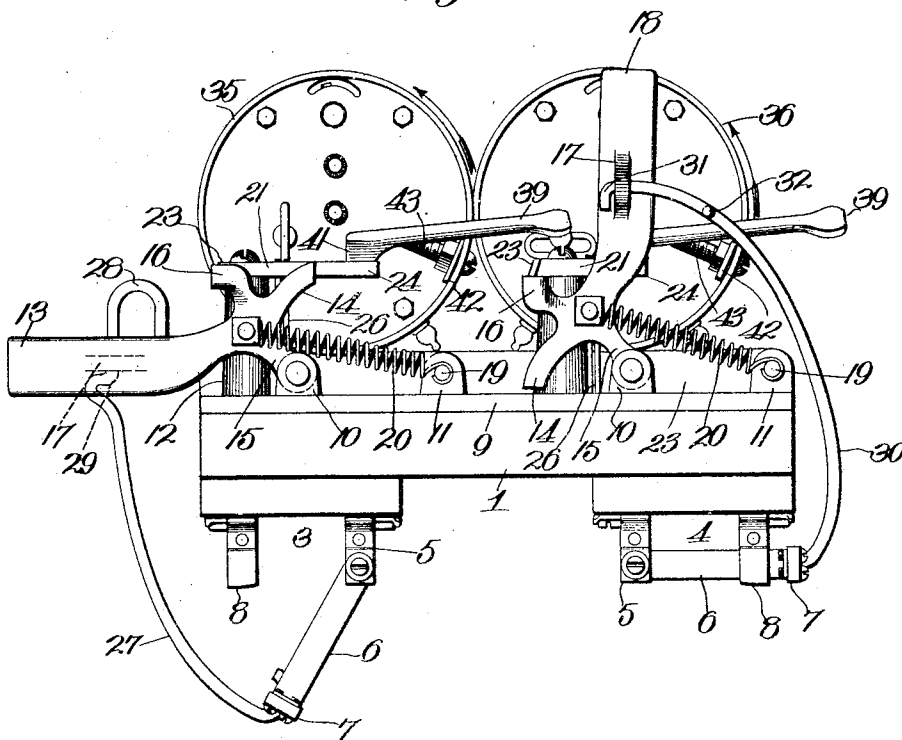


Fig. 4.

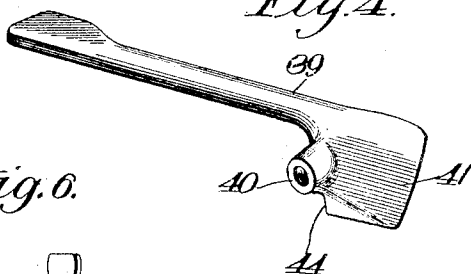


Fig. 6.

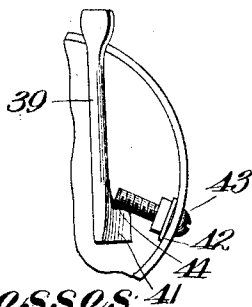
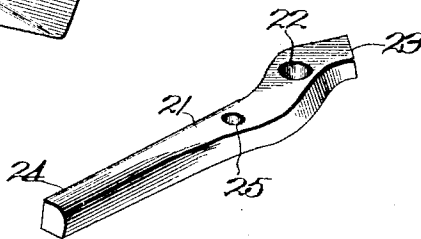


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ELECTRIC TIME-SWITCH MECHANISM.

945,013.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed July 12, 1907. Serial No. 383,525.

To all whom it may concern.

Be it known that I, WILLIAM C. BLUNDELL, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Electric Time-Switch Mechanism, of which the following is a specification.

This invention relates to electric time switches and is designed more especially as an improvement in the electric time switch patented May 12, 1903, #727,578, W. C. Blundell and C. F. Brower inventors, and my object is to produce a switch which will operate efficiently and reliably and which cannot be reset without first resetting the time-controlling mechanisms.

A further object is to produce a switch in which the time mechanisms or clocks are movable to enable the operator to more conveniently and expeditiously reset them.

A still further object is to produce a switch of this character in which time mechanisms have a maximum of leverage against a minimum of resistance for the purpose of insuring the operation of the switches at predetermined times.

With these general objects in view and others as hereinafter appear, the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which:—

Figure 1, is a top plan view of an electric time switch embodying my invention. Fig. 2, is a side view of the same. Fig. 3, is a back view with the back wall of the supporting bracket or frame omitted. Fig. 4 is an enlarged detail perspective view of one of the trip levers. Fig. 5, is an enlarged perspective view of one of the catches. Fig. 6, is a detail view of a lever and stop forming part of the invention.

In the said drawings a bracket preferably of wood comprises a shelf 1 and back wall 2, and is adapted to be fastened to a wall or other support by bolts, not shown, extending through said wall. Underlying and secured to said shelf are switches 3 and 4, each consisting of the insulated posts 5, a pair of knife levers 6, pivoted to said posts and connected by the insulated bar 7 and a pair of

insulated contact posts 8 for engagement by 55 said levers, said switches forming parts of an ordinary electric light or other circuit not shown because of common and wellknown type. Secured upon shelf 1, near wall 2, is a plate 9, provided with two pairs of upwardly projecting hinge lugs 10, and corresponding pairs of upwardly projecting lugs 11 and also projecting upward from said plate are posts 12.

13 is a curved lever having one end 14 to 65 act as a stop to limit the lever movement in one direction and said lever is provided with a pair of oppositely projecting arms 15 and 16, the arm 15 being pivoted to and between lugs 10, the handle end of said lever 70 having a forwardly projecting perforated lug 17. A duplicate, 18, of said lever except that its position is reversed so that its perforated lug 17 shall project rearward instead of forward, is pivotally carried by and 75 between the other pair of lugs 10.

19 indicates pins carried by lugs 11, and 20 retractile springs secured at their opposite ends to said levers and said pins, the springs connected to lever 13 tending to 80 throw the same from a horizontal to a vertical position and the spring connected to lever 18 tending to throw the same from a vertical to a horizontal position.

21 indicates a pair of similar catches provided with pivot holes 22 and adapted to be pivoted through said holes on the upper ends of posts 12, the holes 22 being disposed near corresponding ends of the levers so as to provide short arms 23 and long arms 24, it 90 being noted by reference to Fig. 5, particularly that the long arms are preferably rounded at their front upper corners and said long arms are provided with holes 25 to receive the upper ends of substantially 95 upright double-armed springs 26 secured at their lower ends in any suitable manner to the plate 9.

27 indicates a curved rod pivoted at its lower end to the cross bar 7 of one set of 100 the knife-levers, terminating at its upper end in a down-turned hook 28 extending slidably through the perforated lug 17, the rod being bent as at 29 below said lug to provide a shoulder for a purpose which herein- 105 after appears.

30 indicates a curved rod pivotally connected at its lower end to the cross bar 7

connecting the other pair of contact members 6 and extending at its upper end through the perforated lug 17 of lever 18 and terminating at its extreme upper end in a hook 31 and provided near its upper end and at the opposite side of lug 17 from hook 31, with a shoulder 32 in the path of movement of said lever.

33 is a support pivoted at 34 on shelf 1 forward of plate 9, and 35-36 are time mechanisms or clocks secured upon said support in any suitable manner, said time mechanisms being in the form of alarm clocks without the bell or alarm. The support is equipped with a slidable bolt 37 for engagement with a keeper 38 secured to the shelf, this bolt and keeper providing means for preventing accidental pivotal movement of the holder.

39 indicates a pair of levers provided with forwardly projecting hub portions 40 to be screwed or otherwise rigidly fastened on the alarm arbors, not shown, of the clocks and near said hub portions with beveled or cam ends 41 to engage the rounded front corners of the long arms of catches 21.

42 indicates stop plates secured by screws 43 to the clocks to limit movement of the levers 39 in the direction which they must move to rewind the springs, not shown, for operating the said arbors, the screws 43 extending substantially radially of the centers of the clocks and being of sufficient length to project into the path of shoulders 44 of the levers 39, so as to prevent said levers from being turned more than a quarter of a revolution under the rewinding action of said arbor controlled springs.

To set the switch, clock 35 is set for automatic operation at say 7.00 p. m. and clock 36 at say 11.00 p. m., this setting operation and any other attention which the clocks require, being accomplished when the support 33 is swung forward in the direction indicated by the arrow Fig. 1, in which condition convenient access to the winding and setting mechanisms of the clocks may be had. The lever 13 is swung downward to the position shown, until its arm 16 engages and pushes the short arm of the contiguous catch 21 forward, the spring 26 of said catch causing said arm to swing back over arm 16 and hold lever 13 in its depressed position, in such movement lug 17 by engagement with shoulder 29 of rod 27 forcing the latter downward and opening switch 3. Lever 18 is swung from a substantially horizontal to the vertical position shown and in such action its arm 16 pushes aside the short arm of the contiguous catch 21, said catch being returned to its original position by spring 26 so as to hold said lever in its vertical position. In this setting operation of the lever its lug 17 by engagement with the hook-end 31 of rod 30 closes

switch 4. The hinged or pivoted support is then swung back to its original position and in such action disposes the beveled or cam ends 41 of levers 39 adjacent to the rounded corners of the long arms of the catches. Now when the alarm mechanism of clock 35 operates it swings its lever 39 upward and through its beveled or cam end applies rearward pressure on the beveled front corner of its respective catch 21, thus tripping the short arm of the catch from the path of arm 16 and permitting arm 13 to be swung upward by the retractive action of its springs 20. At the initial part of such movement of said lever practically no resistance is offered to said springs but after the lever acquires momentum its lug 17 strikes the arched portion of hook 28 and pulls rod 27 upward until its switch 3 is closed between posts 5 and 8, the closure of this switch as will be readily understood, completing an electric circuit through the lamps, not shown, or for any other purpose, it being understood in this connection that the alarm spring can not be unwound materially because of the arrest of lever 39 by the contiguous screw 43, as shown in Fig. 6. At 11.00 p. m. clock 36 automatically operates and through the instrumentalities described releases lever 18 and permits its springs 20 to draw it down to its original positions. In such action, it first slides unresisted on the upper end of rod 30 and then after momentum is acquired, strikes shoulder 32, the impact being sufficient to break the circuit through switch 4 by forcing the knife switches 6 out of engagement with posts 8, the breaking of the circuit of course resulting in the extinguishing of the lights. After the circuit has been made through the instrumentality of clock 35 and broken through that of clock 36, levers 39 remain in their vertical positions as shown in Fig. 6, until the mechanism is reset and in this connection it will be noticed that to reset lever 13, the operator grasps it and pulls it downward until its arm 16 is again below arm 23 of its lever 21 and lever 18 is swung upward until its arm 16 is below its respective lever 21.

To reset the alarm mechanism of the clocks the latter are swung out with holder 33, the operator then forcing levers 39 back to their original positions as shown most clearly in Fig. 3 so that when the holder is swung back with the clocks to its original position and so secured automatically by the slidable latch and keeper, said levers will assume their proper relation to the long arms of catches 21 but will not touch or trip the same until the levers again turn with their respective alarm arbors. In this connection it will be noticed that the levers 13 and 18 cannot be secured in the positions shown in Fig. 3 when levers 39 are in the position shown in Fig. 6 because the latter in such position

hold the short arms of the catches 21 withdrawn from the path of arms 16 of said levers 13 and 18. It will also be apparent that should said last-named levers be reset while the clocks are swung forward they will be tripped when said clocks are swung rearward unless the levers 39 have been previously reset, so as to be incapable of tripping catches 21, until rotatably operated.

From the foregoing, it will be apparent that by limiting the movement of arms or levers 39, the complete unwinding of the alarm springs is prevented and the resetting of said arms or levers is consequently facilitated. It will also be seen that by making it impossible to reset the levers 13 and 18 previous to the resetting of the clocks, all chance of the electric circuit remaining unbroken longer than a predetermined time and therefore at an unnecessary cost to the consumer, is avoided.

From the above description it will be apparent that I have produced a time switch mechanism which will operate efficiently and reliably and in which the lever-controlled switches cannot be set for automatic operation unless the clocks are wound and secured in proper relation to said switch controlling levers, and I wish it to be understood that I do not desire to be restricted to the exact details of construction shown and described as obvious modifications will suggest themselves to one skilled in the art.

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

1. An electric time switch mechanism, comprising a pair of electric switches, a pair of levers for automatic operation when unresisted, catches to restrain said levers from automatic operation, a pair of clocks having levers for automatic operation at predetermined times, provided with cam ends adapted to strike and trip said catches, and means to arrest said rotatable arms in the position they assumed in tripping the catches.

2. An electric time switch mechanism, comprising a pair of electric switches, a pair of levers for automatic operation when unresisted, catches to restrain said levers from

automatic operation, a pair of clocks bearing a fixed relation to each other and a movable relation to the catches, a pair of rotatable arms carried by the clocks, and adapted when set for automatic operation at predetermined times and when the clocks are disposed operatively with relation to the catches to be adjacent to the latter, to trip the same means for limiting the movement of said clock levers in one direction, and means to limit such movement in the opposite direction.

3. In an electric time switch mechanism, an electric switch, a lever for automatic operation when unresisted and connected to operate said switch, a spring-actuated catch to restrain said lever from operating, a clock mechanism having a rotatable lever for operation at a predetermined time, provided with a cam end adapted to be disposed adjacent to the catch and to operate the latter at such predetermined time and trip the same to release the first-named lever, and means to arrest such lever with its cam end in position to prevent the resetting of the catch while the clock occupies an operative relation to the latter.

4. An electric time switch mechanism comprising a switch, a plate, a lever pivoted to said plate and connected to operate said switch and provided with a pair of arms, a spring to operate the lever when unresisted until it is arrested by one of the arms coming in contact with the plate, a pivoted catch, a spring to hold the same yielding in the path of the short arm of the lever to prevent the latter from being operated by its spring, a pivoted support provided with a clock having an arm to rotate at a predetermined time, said arm having a cam end to trip the catch from the path of the first-named lever, and means to secure the pivoted support with its clock in a fixed relation to the pivoted catch.

In testimony whereof I affix my signature, in the presence of two witnesses.

WILLIAM C. BLUNDELL.

Witnesses:

H. C. RODGERS,
G. Y. THORPE.