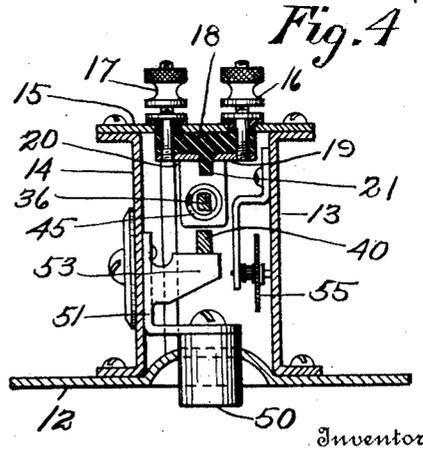
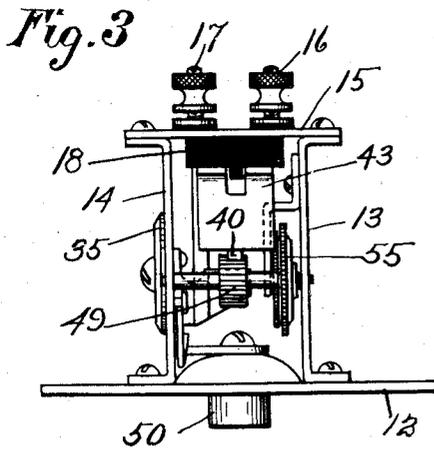
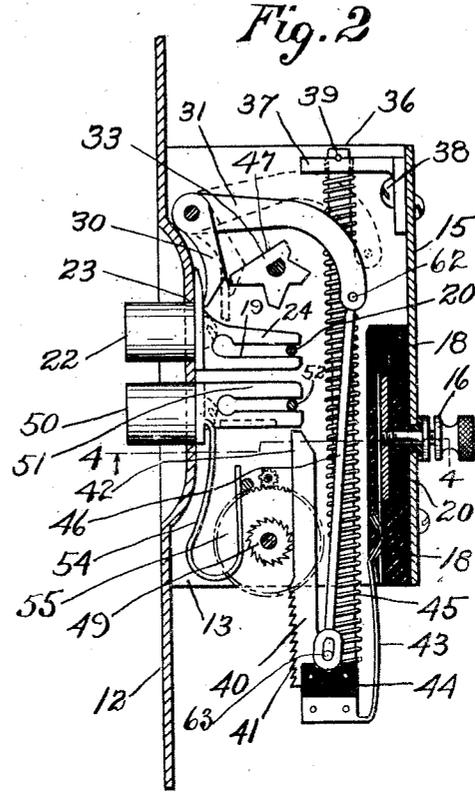
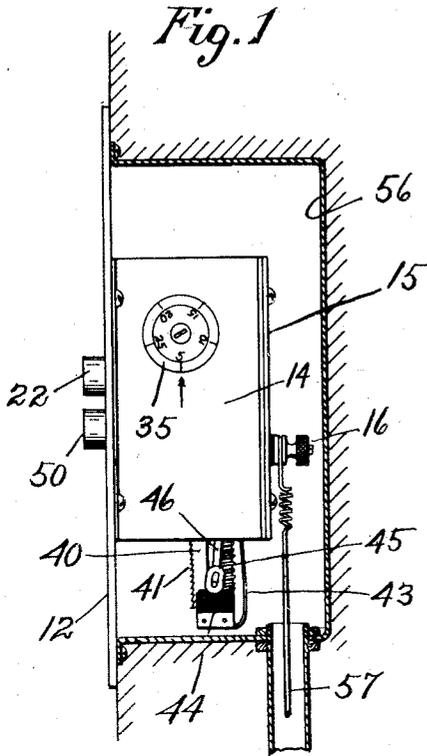


1,193,293.

Patented Aug. 1, 1916.
 2 SHEETS—SHEET 1.



Witness

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1,193,293.

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2 SHEETS—SHEET 2.

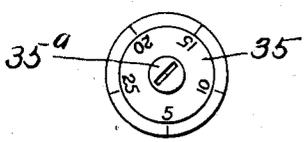
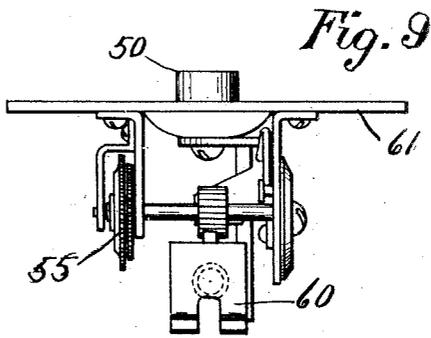
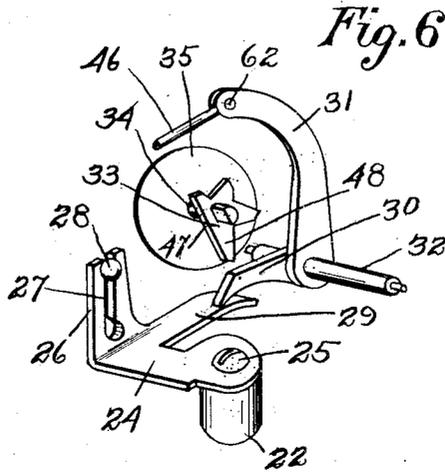
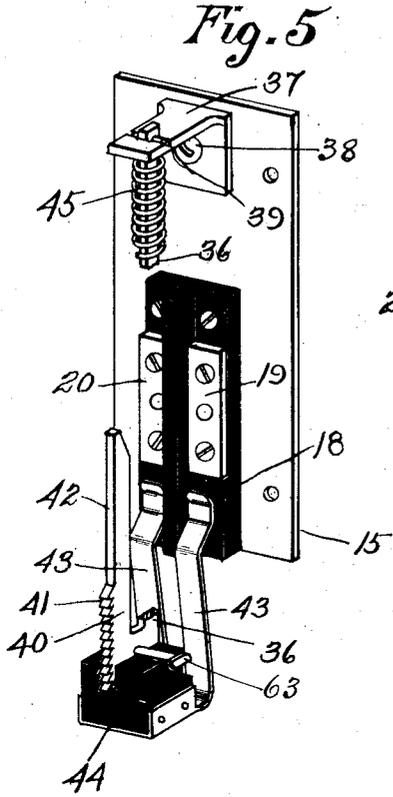


Fig. 7

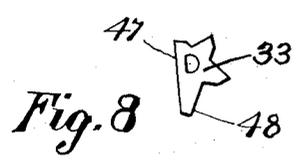


Fig. 8

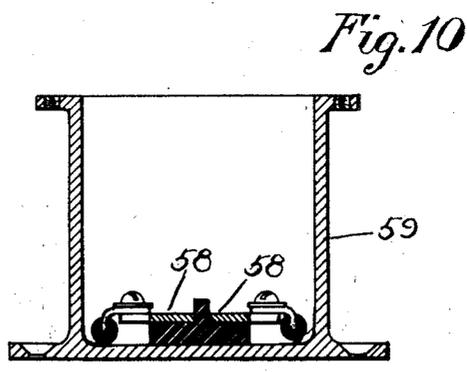


Fig. 10

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TIME-SWITCH.

1,193,293.

Specification of Letters Patent.

Patented Aug. 1, 1916.

Application filed June 17, 1915. Serial No. 34,754.

To all whom it may concern:

Be it known that I, RALPH CLIFTON PATTON, a citizen of the United States, and resident of the city of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in a Time-Switch, of which the following is a specification.

This invention relates to a time switch of the class more particularly adapted to be connected to an electric lighting circuit to automatically break the circuit and extinguish the lights after a predetermined interval.

The object of this invention is to provide in such a switch an actuator and time controlling means therefor, whereby the actuator may be energized and connected to a time controlling mechanism to operate an electric switch after a predetermined interval.

A further object of the invention is the provision of means in the switch whereby the point of connection of said actuator to said time control may be positively determined and varied to cause the contact changes to take place at different intervals.

A still further object of the invention is to provide means whereby the switch may be manually operated if desired to shut off the lights independent of the automatic shut-off means.

It is found in practice that where lights are located in isolated places such as the attic, the cellar or other out of the way place seldom visited, that a preoccupied person, after lighting the lamp, often leaves without extinguishing the same and the light continues to burn until found and turned off by some chance visitor, and therefore, to obviate this useless expenditure, I have devised a switch to meet just such conditions which will, after a predetermined lapse of time, automatically extinguish the light. I have also provided means in this switch whereby the light may be extinguished by a manual operation if desired without waiting for the time interval to expire.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings: Figure 1— is a side elevation showing my improved

time switch as inclosed in a casing, the same being shown in section and the whole being represented as set into a wall. Fig. 2— is a side elevation of my improved casing showing the same partly in section and with one of the side plates removed. Fig. 3— is an end elevation of my improved switch. Fig. 4— is a sectional end view on line 4-4 of Fig. 2. Fig. 5— is a view looking at the inner face of the back plate showing the contact plates and the contact fingers which are carried by the spring operated actuator. Fig. 6— is a perspective view showing the key or operating push button and the means through which it moves the actuator and also showing the adjustable stop for controlling the operating stroke of the key. Fig. 7— is a detail showing a face view of the graduated adjusting disk. Fig. 8— is a detail showing a face view of the graduated stop member. Figs. 9 and 10— show members of another form of casing in which the operating mechanism is mounted.

My improved switch is of the character more particularly designed to be positioned in a wall and operated by one or more push buttons or other form of keys. The switch comprises a front or outer plate 12 which is adapted to be placed over a recess in the wall into which the body of the switch is set and to this plate is connected the side frames 13 and 14 which are for the purpose of supporting the operating mechanism. A back plate 15 is secured to the inner edge of these side frames and on it is carried two binding posts 16 and 17 which are insulated from the frame and are connected through the insulation block 18 to the contact plates 19 and 20 which plates are separated by a central barrier 21. 22 designates the operating push button or key which projects through the hole 23 in the plate 12 and to its inner end is secured an angle plate 24 by means of the screw 25, see Fig. 6. A portion 26 of this plate is bent at a right angle to bear against the wall of the frame 14 and this plate is slotted as at 27. to receive the guide pin 28 by which the button 27 is further guided in its movement in and out through the plate 12. This angle plate 24 is provided with a laterally extending arm 29 which serves a double purpose; first, it engages the finger 30 and through it oscillates the arm 31 which is mounted on the shaft 32 to set the actuator for the purpose herein-

110

after described, and second, this laterally extending arm engages the graduated stop 33, whereby the extent of motion of the push button and the mechanism operated thereby is limited. This graduated stop is connected through the short shaft 34 to the graduated disk 35 illustrated in Figs. 1 and 7, which latter is provided with a slot 35^a in its face whereby the disk may be rotated to bring the required extension of the graduated stop into the desired position to control the movement of the push button 22. The face of this plate is lined off or graduated to indicate the time intervals which under control of the clock mechanism determine the lapse of time before the contact is permitted to shift.

What I have termed the actuator includes the vertically slidable bar 36 and all the members carried thereby. The bar, itself, is loosely mounted at its upper end to slide through and swing in the bracket 37 which is connected by screws 38 to the back plate 15. A pin 39 limits the downward motion of this bar through the bracket and to the lower end of this bar is connected a rack member 40 having a number of teeth 41 on its edge for the lower portion of its length, said rack member being plain or without teeth at its upper portion. To the lower end of this bar and rack is connected a pair of spring contact fingers 43 electrically connected together but insulated from the bar by the block 44. These fingers extend upward from the base of the bar, see Fig. 5, and normally rest with a spring tension upon the insulation block 18. The tension of these fingers serves a double purpose; first, to insure a proper electric contact when brought into engagement with the contact plates 19 and 20 and second, to yieldably press the rack member 40 into engagement with the driving pinion 49 which latter is controlled in its movement by clock gearing or other suitable time controlling mechanism 55 of any of the usual forms, a detail description of that shown being deemed unnecessary. One of the features of this construction is the provision of a coil spring 45 wound around the bar 36 throughout its length. One end of this spring engages the underside of the bracket 37 while the opposite end presses downward upon the bar to move the actuator and normally hold the contact members 43 out of engagement with their respective plates 19 and 20. In order to control the movement of this actuator, and prevent the spring when compressed from immediately moving the contact members from operative to inoperative position, to break the circuit, I have provided the said clock mechanism 55.

When the button 22 is pressed inward, the actuator is raised through the medium of the arm 29, finger 30, arm 31 and con-

necting link 46, which latter is connected by pin 62 to said arm 31 and by pin 63 to the actuator. The raising of this actuator causes the rack to engage the pinion 49 presently described, the extent of its rise being controlled by the position of the graduated stop member 33 and the extent of this rise also determines the number of teeth in the rack which shall act upon the pinion 49 during that particular stroke. When it is desired that the maximum time shall elapse after connecting the rack to the pinion before the same is released to throw the contact the graduated stop is rotated to present the shortest side 47 to the arm 29 and so permit the button and the mechanism controlled thereby to receive the maximum stroke; and when the shortest time is desired, the longest finger 48 is presented to the arm 29 in which case the minimum number of rack teeth are connected to those of the pinion and so by the same method any of the intermediate positions may be readily obtained. By this construction, it will be seen that the spring 45 acting through the rack, serves to drive the clock mechanism the speed of the driving pinion 49 being controlled by two elements; first, by the strength of the spring 45, and second, by the arrangement of the elements in the clock mechanism. When but a short time is desired to elapse after the circuit has been closed by the positioning of the contact fingers, a minimum number of teeth are positioned to come into engagement with the pinion 49 before being released thereby and the spring 45 acting on the pinion through the rack drives the clock mechanism to rotate this pinion until it releases the rack at which time the latter under force of the spring jumps downward and causes the contact fingers to quickly break the electric circuit. When a greater length of time is desired to elapse the rack is raised higher and more teeth are positioned to come into engagement with the pinion before the rack is released.

A feature of this invention is that the rack may be lifted from engagement with the pinion to permit the contact to break the circuit and extinguish the lights whenever desired. To accomplish this, I have provided a second button or key 50 which slides through the plate 12 and is also guided by a slotted plate 51 on the pin 52, which plate is provided with a finger 53, see Fig. 4, extending outward for the purpose of engaging the rack member 40 and releasing it from the pinion to move the contacts to break the circuit and cause the lights to be extinguished. A spring 54 is arranged to press upon this button to return the same to normal when released.

I have shown the clock mechanism as being located between the side walls 13 and 14, 110

but in practice it is sometimes found to be most convenient to place this mechanism outside of the frame 14 in the manner illustrated in Fig. 9, whereby it may be more accessible for inspection and repairs. One form of clock mechanism is shown but any form of time regulated mechanism may be employed. When this switch is completed and ready to be inserted into the wall the mechanism is entirely inclosed in an outer casing 56 which keeps foreign matter from the operating mechanism. The circuit wires 57 are shown in Fig. 1 as being connected through the lower portion of the casing to the binding posts 16 and 17 in the rear.

In Figs. 9 and 10, I have illustrated another form of casing in which the contact plates 58 are placed in the back portion of the casing 59, and the contact members 60 are carried in the front portion whereby when the top plate 61 is moved from the bottom or inner casing the operating mechanism is entirely exposed rendering the same more accessible, but I do not wish to be restricted to any particular form or arrangement of parts as the same may be changed in many particulars without departing from the spirit and scope of my invention.

I claim:

1. A time switch comprising a slidable actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, means for moving the actuator bar to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of the period for which the timing mechanism is set.

2. A time switch comprising a slidable actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, a push button, means operated by the push button for moving the actuator bar to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of

the period for which the timing mechanism is set.

3. A time switch comprising a slidable actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, a pivoted arm connected with the actuator bar, a push button for rocking said arm, whereby the actuator bar is moved to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of the period for which the timing mechanism is set.

4. A timing switch comprising a slidable actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, a rock shaft provided with an arm connected with said actuator bar, a finger also carried by said rock shaft, a button positioned to engage said finger to rock said shaft, whereby the actuator bar is moved to shift the contact member and to compress the spring on one operation, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of the period for which the timing mechanism is set.

5. A time switch comprising a slidable actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, means for moving the actuator bar to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of the period for which the timing mechanism is set, and means for variably limiting the movement of said actuator bar in the spring-compressing direction.

6. A time switch comprising a slidable actuator bar, a spring acting upon the same,

- a contact member movable with said actuator bar, a push button, means operated by the push button for moving the actuator in one direction, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of the period for which the timing mechanism is set and means for variably limiting the inward movement of said push button.
7. A time switch comprising a slidable actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, a push button provided with an arm, means engaged by the arm of the push button for moving the actuator bar to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of the period for which the timing mechanism is set, and means positioned to engage the arm of the push button to limit movement thereof.
8. A time switch comprising a slidable actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, a push button, means operated by the push button for moving the actuator in one direction, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of the period for which the timing mechanism is set, and a graduated stop positioned to variably limit inward movement of said push button.
9. A time switch comprising a slidable actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, a push button provided with an arm, means engaged by the arm of the push button for moving the actuator bar to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of the period for which the timing mechanism is set, and a graduated stop positioned to engage the arm of the push button to limit movement thereof.
10. A time switch comprising a slidable actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, a push button, means operated by the push button for moving the actuator bar in one direction, timing mechanism, a rack member attached to said bar and having a toothed portion and a smooth portion, said smooth portion being normally in engagement with said timing mechanism, the toothed portion of said rack member being positioned to engage the timing mechanism when the bar is moved to compress said spring, the smooth portion of the rack member permitting accelerated return movement of the actuator bar at the end of the period for which the timing mechanism is set, a rotatable shaft, and radiating pins of different lengths carried by said shaft and positioned to selectively limit inward movement of said push button.
11. A time switch comprising a slidable actuator bar, means for pivotally supporting said bar, a spring acting upon the bar, a contact member movable with said actuator bar, means for moving the actuator bar to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and positioned to engage said timing mechanism, and means for moving the bar to disengage the rack member from said timing mechanism.
12. A time switch comprising a slidable actuator bar, a supporting bracket, means for pivotally suspending said bar, in said bracket, means for pivotally supporting said bar, a spring acting upon the bar, a contact member movable with said actuator bar, means for moving the actuator bar to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and positioned to engage said timing mechanism and means for moving the bar to disengage the rack member from said timing mechanism.
13. A time switch comprising a slidable actuator bar, means for pivotally supporting said bar, a spring acting upon the bar,

- a contact member movable with said actuator bar, means for moving the actuator bar to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and positioned to engage said timing mechanism, a push button, and means operated by the push button for disengaging the rack member from said timing mechanism. 15
- 5 14. A time switch comprising a slidable and pivoted actuator bar, a spring acting upon the same, a contact member movable with said actuator bar, a push button for moving the actuator bar to shift the contact member and to compress the spring in one operation, timing mechanism, a rack member attached to said bar and positioned to engage said timing mechanism, a second push button contiguous to the first push button, and means operated by the second push button for disengaging the rack member from the timing mechanism. 20
- 10 In testimony whereof I affix my signature in presence of two witnesses.

RALPH CLIFTON PATTON.

Witnesses:

GEORGE W. STEERE,
GEORGE GIVENS RAGST.