Feb. 13, 1940. W. MORRONE 2,190,241

TIME CONTROLLED SWITCH

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Fig. 1.

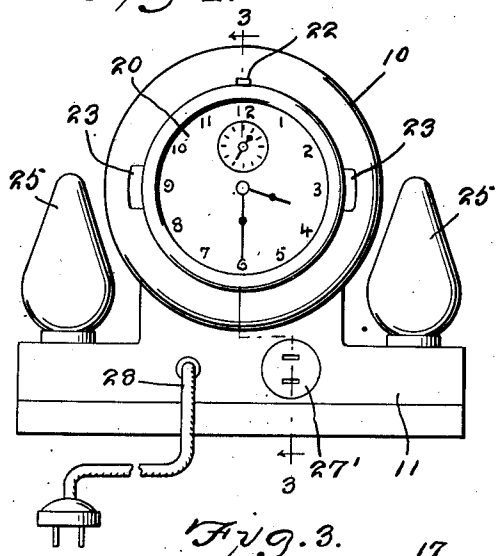


Fig. 2.

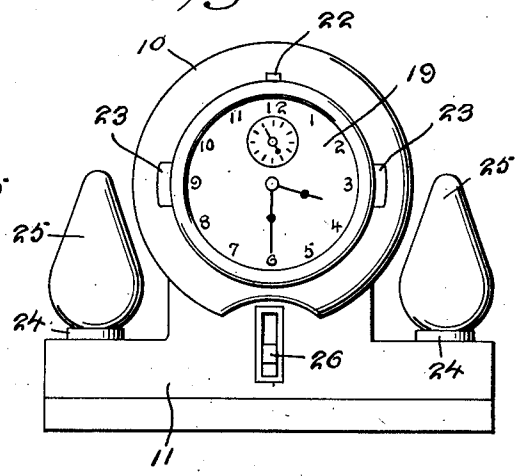


Fig. 3.

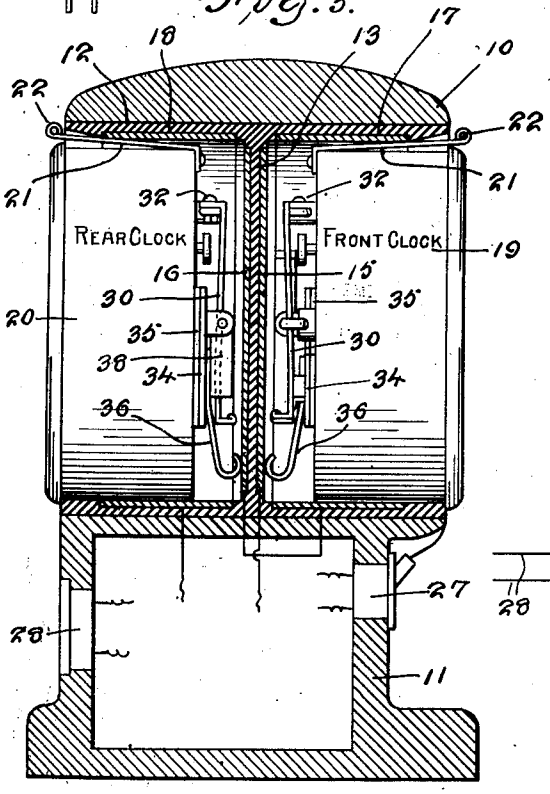
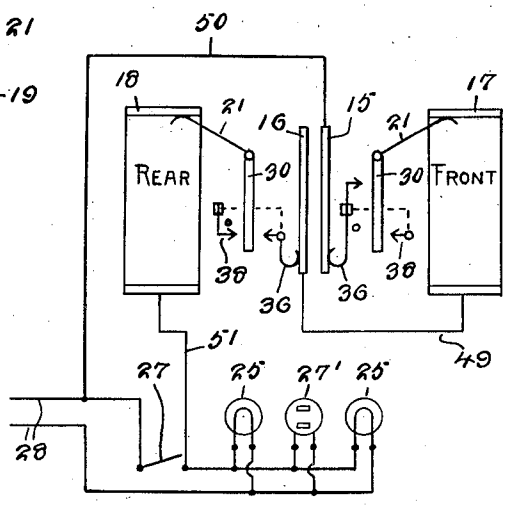


Fig. 11.



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Fig. 4.

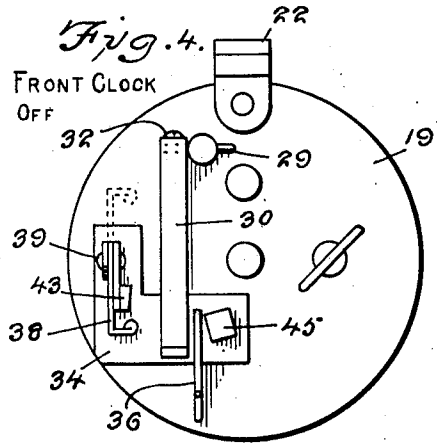


Fig. 5.

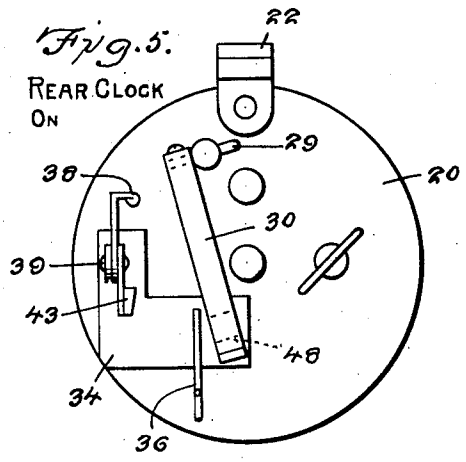


Fig. 6.

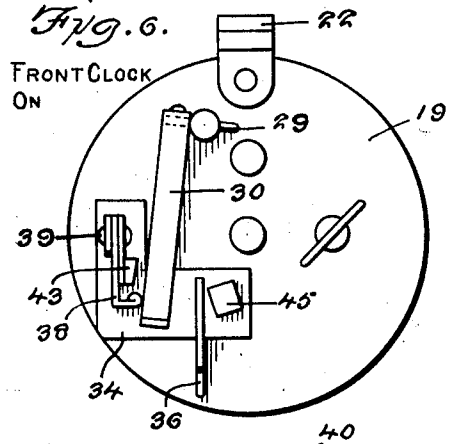


Fig. 7.

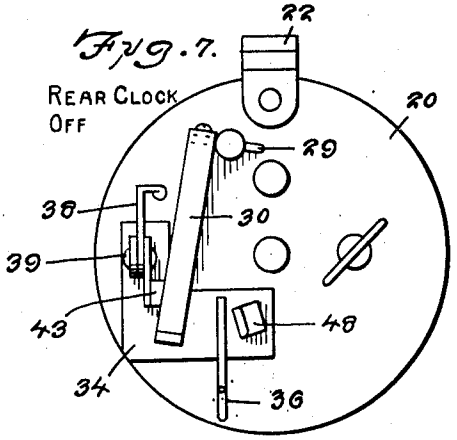


Fig. 8.

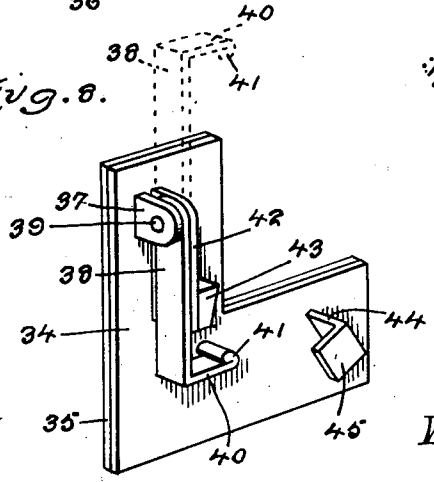


Fig. 9

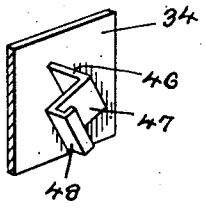
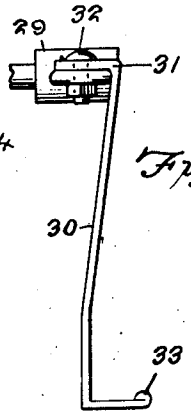


Fig. 10.



William Morrone INVENTOR

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ATTORNEYS

Patented Feb. 13, 1940

2,190,241

UNITED STATES PATENT OFFICE

2,190,241

TIME CONTROLLED SWITCH

William Morrone, Oakdale, Pa., assignor of forty per cent to Salvatore F. Gallo, and five per cent to Joseph Miller, both of Oakdale, Pa.

Application April 25, 1939, Serial No. 269,991

2 Claims. (Cl. 200—35)

This invention relates to time controlled switches and has for an object to provide a device of this character which may be essentially constructed of an inexpensive alarm clock provided with a switch arm connected to the alarm winding key and a stationary contact having a hinged portion adapted to be manually set to coact with the arm in controlling current supply to flood lamps, show window lamps, and other lamps desired to be energized through a predetermined time period.

A further object is to provide a housing carrying conductors, electric connections, a front alarm clock and a rear alarm clock in accordance with the invention, the housing being adapted to permit the clocks being easily removed and replaced selectively for setting the time responsive switches thereof.

A further object is to provide a time controlled switch of this type which will be formed of a few strong, simple, and durable parts which will be inexpensive to manufacture and which will not easily get out of order.

With the above and other objects in view the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings forming part of this specification:

Figure 1 is a rear elevation of a time controlled switch constructed in accordance with the invention and showing the rear alarm clock.

Figure 2 is a front elevation of the time controlled switch of the front alarm clock.

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 1, drawn to enlarged scale, with parts removed.

Figure 4 is a rear elevation of the front clock showing the contact arm in off position.

Figure 5 is a rear elevation of the rear clock showing the contact arm in on position.

Figure 6 is a rear elevation of the front clock shown in Figure 4 with the arm in on position.

Figure 7 is a rear elevation of the rear clock shown in Figure 5 with the arm in off position.

Figure 8 is a detail perspective view showing the hinged stationary contact of both clocks.

Figure 9 is a detail perspective view of the stationary contact having a locking hook.

Figure 10 is a side elevation of the switch arm carried by the winding key of both clocks.

Figure 11 is a diagrammatic view showing the electrical connections of the various parts of the time controlled switch and pilot lights.

Referring now to the drawings in which like characters of reference designate similar parts in the various views, 10 designates a substantially cylindrical housing provided with an integral frame base 11. A cylinder 12 of insulating material lines the housing and is provided with a centrally disposed diaphragm 13 also formed of insulating material. A pair of metal discs 15 and 16, forming electrical conductors, are disposed on the front and rear faces respectively of the diaphragm and a pair of metal rings 17 and 18 are disposed on the inner wall of the insulating cylinder, respectively in front of and in rear of the diaphragm, and these rings also form conductors.

A pair of inexpensive alarm clocks 19 and 21 are disposed in respective open ends of the housing 10 and will hereinafter be referred to as a front alarm clock and a rear alarm clock. Each alarm clock is equipped at the top with a leaf spring 21 adapted to wedge the alarm clock against the respective conductor ring to make good electrical contact between the metal of the clock and the ring. The leaf spring terminates in a rounded tip 22 which may be forced toward the clock by one of the operator's fingers while two other fingers are engaged in notches 23 in the ends of the housing and pressed against the sides of the clock to easily insert and remove the clock for setting the time responsive switch mechanism thereof.

On each side of the top of the frame base 11 a lamp socket 24 and pilot lamp 25 are mounted. The operating lever 26 of a conventional electric switch 27, projects through the front face of the frame base. The socket member 27 of a conventional plug connection is exposed on the rear face of the frame base. Also a current supply cord 28 extends from the rear of the face of the frame base. The pilot lamps 25 and outlet socket 27 are electrically connected to the source of cord supply and pilot lamps so that it may be manually closed whenever desired to supply current from the outlet socket 27 to floor lamps, show window lamps, or other devices, and simultaneously energize the pilot lamps. When the switch is open current supply will be automatically controlled to the lamps of other devices through a predetermined time period by switch mechanism on the alarm clocks as will now be described.

The alarm winding key 29 of each clock is

equipped with a metal switch arm 30, best shown in Figure 10. The arm is provided with a perforated bent extremity 31 through which a bolt 32 or other connector is passed to secure the arm to the key. The free end of the arm is directed outwardly to extend perpendicular to the arm as shown in 33 and form a contact point.

Each clock is also equipped with a substantially right angular metal plate 34, forming a conductor and best shown in Figure 8, which is insulated from the metal back of the clock through the medium of a similarly shaped blank 35 of insulating material best shown in Figure 3. A wire leaf spring 36 is connected at one end to the plate 34 and the free end of the spring is adapted to bear upon the respective conductor disc 15 or 16 of the housing 10.

The metal plate 34 of each clock is equipped with a pair of hinge ears 37 between which is received a switch contact 38. A pivot pin 39 is passed through the ears and through one end of the switch contact 38 to pivotally mount the contact to be swung through an arc of 180° to operative position as shown in full lines in Figure 8 or to released position as shown in dotted lines in this figure.

The switch contact 38 is provided with a laterally directed extension 40 having a rounded tip 41 adapted to be disposed in the path of the arm 30, as indicated in Figure 6, to form a circuit closer. One of the hinge ears 37 is provided with an extension 42 upon which is secured a block 43 of insulation against which the contact point 33 of the arm 30 is adapted to lodge when the switch contact 38 is swung to released position and form a circuit opener.

Each clock is equipped with an additional stationary contact. As shown in Figures 4 and 6, the front clock is equipped with a stationary contact of substantially right angular shape including a leg 44 which extends perpendicular to the conductor plate 34 and a leg 45 which extends parallel with the conductor plate. The rear clock 20 is provided with an angular stationary contact of substantially Z-shaped contour, best shown in Figure 9, to comprise a leg 46 which extends perpendicular to the conductor plate 34, a leg 47 which extends parallel with the conductor plate, and a hook 48 on the end of the leg 47.

By referring to Figure 11 it will be seen that the conductor ring 17 of the front clock is connected by a wire 49 to the conductor disc 16 of the rear clock. The conductor disc 15 of the front clock is connected by a wire 50 to the current supply. A wire 51 connects the conductor ring of the rear clock with the current supply. The connections are such that when the switch 27 is open, current will be supplied to the switches carried by the clocks for automatically controlling lamps or other electrical devices which are to be turned on and off at predetermined times.

To set the time responsive switches the rear clock, shown in Figures 1 and 5, may be removed and its circuit closing arm 30 moved into contact with the stationary contact 45 thereof. This closes the time responsive circuit at this point. The hinged contact 38 is now swung out of the path of the arm. Then the clock is replaced. The front clock, shown in Figures 2 and 4, is now removed and its circuit closing arm 30 is disposed between both contacts 38 and 45.

When the time arrives for the lights to be turned on, the alarm winding key 29 of the front clock will be moved to swing the arm 30 into engagement with the stationary contact 38 as shown in Figure 6. The time responsive circuit is now energized and may be traced, as shown in Figure 11, from the current supply to the wire 50, contact disc 15 of the front clock, leaf spring 36 of the front clock, conductor ring 17 in the front of housing 10, wire 49, conductor disc 16 of the rear clock, leaf spring 36 of the rear clock, conductor ring 18 in the rear of the housing 10, and wire 51 to the current supply, to energize the pilot lamps 25 and lamps to be controlled, which are plugged in at the outlet socket 27.

When the time arrives for the lamps to be extinguished, the alarm winding key 29 of the rear clock will be moved and move the circuit closing arm 30 off of the lip of the hook 48 of the stationary contact, upon which it has been resting, into contact with the insulating block 43 as shown in Figure 7. This opens the time responsive circuit, above traced, at this point, and the lights are extinguished.

Although the use of two control clocks has been described, one to turn on the power and one to turn off the power, it will be pointed out that both clocks can be set to turn off the power so that in case one clock fails to perform its duty the other will do its work, thus assuring dependability of operation.

From the above description it is thought that the construction and operation of the invention will be fully understood without further explanation.

What is claimed is:

1. Time controlled switch apparatus comprising an alarm clock, a housing encircling the alarm clock, a metal conductor in the form of an annulus engaging the peripheral metal wall of the clock and insulated from the housing, a metal conductor forming a diaphragm across the housing in rear of the clock and insulated from the housing, an insulated stationary switch contact on the rear wall of the clock, a metal leaf spring electrically connecting the contact to the diaphragm contact, said alarm clock having an alarm winding key, and a switch arm fixed at one end to the key and having the free end adapted to engage the fixed contact in circuit closing position.

2. Time controlled switch apparatus comprising an alarm clock, a housing encircling the alarm clock, a metal conductor in the form of an annulus engaging the peripheral metal wall of the clock and insulated from the housing, a metal conductor forming a diaphragm across the housing in rear of the clock and insulated from the housing, an insulated stationary switch contact on the rear wall of the clock having a hinged portion, a stationary insulating contact on said stationary switch contact and exposed when the hinged portion of the stationary switch contact is rocked to released position beyond the insulated contact, a metal leaf spring electrically connecting the stationary switch contact to the diaphragm contact, said alarm clock having an alarm winding key, and a switch arm fixed at one end to the key and having the free end adapted to engage the hinged portion of the fixed switch contact when the hinged portion is in one position of the pivotal movement and adapted to engage the insulating contact when the hinged portion is rocked to its other position of pivotal movement for effecting respectively closed circuit and open circuit position of the arm.

WILLIAM MORRONE.