Feb. 5, 1952 R. M. COLE 2,584,673

DELAYED-ACTION SWITCH

Filed Sept. 11, 1947

Fig. 1.

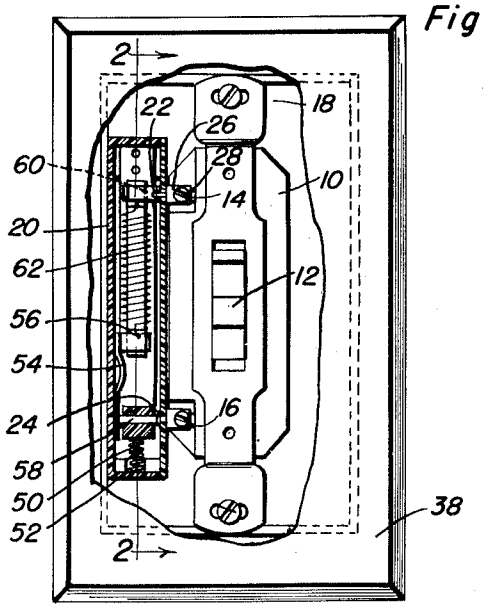
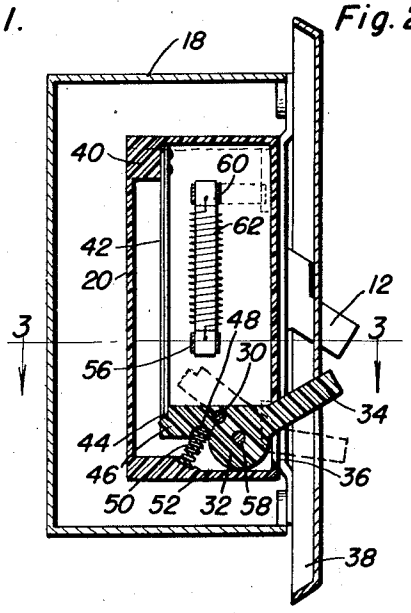


Fig. 2.



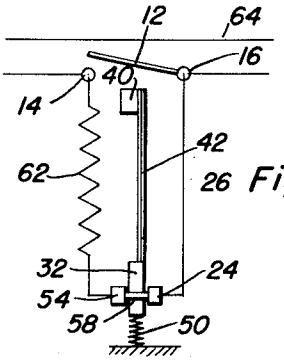


Fig. 4.

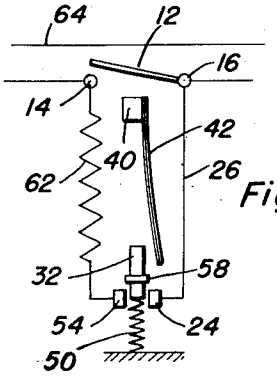
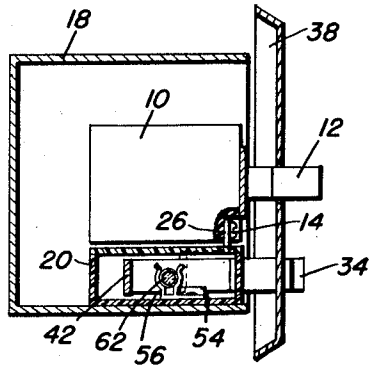


Fig. 5.

Fig. 3.



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DELAYED-ACTION SWITCH

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Application September 11, 1947, Serial No. 773,451

3 Claims. (Cl. 200—116)

1

This invention relates to new and useful improvements in delayed action switches and the primary object of the present invention is to provide a novel and improved method of delaythe break of current at a light or power terminal after the line switch has been placed in an open or "off" position.

Another important object of the present invention is to provide a small and compact delayed action switch that is quickly and readily applied to a conventional switching mechanism in the minimum time or removed therefrom for inspection or replacement of parts.

A further object of the present invention is to provide a delayed action switch including novel and improved thermostatic control means that will permit a predetermined delay in the deenergizing of a light, motor or the like.

A still further aim of the present invention is to provide a delayed action switch that is simple and practical in construction, strong and reliable in use, neat and attractive in appearance, relatively inexpensive to manufacture, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a front elevational view of a toggle switch showing the present invention applied thereto, and with parts broken away and shown in section;

Figure 2 is a longitudinal vertical sectional view taken substantially on the plane of section line 2—2 of Figure 1;

Figure 3 is a transverse horizontal sectional view taken substantially on the plane of section line 3—3 of Figure 2;

Figure 4 is a diagrammatic view showing the present invention applied to the wiring circuit of a conventional switch, and;

Figure 5 is a diagrammatic view showing the actuating lever of the present invention in an "off" position, and showing the device applied to the wiring circuit of the conventional switch.

Referring now to the drawing in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a conventional toggle switch mechanism including a switch lever 12 and contact points 14 and 16 which are enclosed in a switch box 18. Also mounted within the switch box 18, is an insulated substantially rectangular casing 20 having an upper contact terminal 22 and a lower contact terminal 24 rigidly secured to one of its sides.

2

Rigidly carried by these contact terminals 22 and 24, is a pair of angular conductive members 26 having notches 28 in their outer ends to engage the contact points 14 and 16 of the switch mechanism 10. These members 26 also retain the casing in position within the switch box 18.

Pivotally mounted as at 58 within the casing, is an enlarged central portion of a switch lever 32 having one terminal 34 projecting outwardly through aligned apertures or slots 36 provided in the casing 20, the switch box 10, and the switch box cover 38.

Fixedly secured at one terminal to a bearing block 40 integrally formed at the upper rear corner of the casing 20, is a thermostatic preferably bi-metal expander arm 42 having its free terminal normally engaging a notched portion 44 provided in the inner terminal 46 of the lever 32, to retain the terminal 34 of the lever in a raised position as shown best in Figure 2.

A lug 48 projects outwardly from the lower face of the lever 32 and engages a coil spring 50 which is normally biased between the lever and an inclined shoulder 52 provided in the lower wall of the casing 20. Rigidly secured to the inner face of the casing, adjacent the lower contact terminal 24, is a resilient contact arm or member 54 supporting a spring clip 56.

A contact shaft 30 carried by the enlarged portion of the lever 32 connects the lower contact terminal 24 to the contact arm 54, when the terminal 34 of the lever 32 is in a raised position.

Fixedly carried by the upper contact terminal 22, is a spring clip 60 that cooperates with clip 56 to engage and support a resistant coil or heating member 62.

In practical use of the device, the switch 12 being in an open and lowered position, as shown best in Figures 2 and 4, and the lever 34 being in a raised position, the current will enter contact point 16 and contact terminal 24, pass through contact shaft 30, contact arm 54, into the heater 62, through contact terminal 22 and outwardly through contact point 14. During this procedure, a light or motor (not shown) applied to the circuit 64 connected to the switch 10, will remain energized until the heater reaches such a temperature as to expand the arm 42 which will cause the same to disengage the lever 32 and the spring will pivot the terminal 46 of

the lever upwardly and the terminal **34** of the lever downwardly, as shown in dotted lines in Figure 2. The light or motor will then be deenergized. To reengage the lever **32** with the arm **42**, it is merely necessary to push the terminal **34** of the lever upwardly when the switch **10** is in an "on" position.

Should the lever **32** be engaged with the arm **42** when the switch **10** is in an "on" position, and the light or motor is energized, the current in the circuit **64** will tend to seek a path of least resistance which will not permit enough current to flow through the heater **62** to cause the same to actuate the arm **42**, but as soon as the switch **10** is actuated to an "off" position, the heater will receive all of the current in the circuit which will actuate the arm **42**.

Obviously, the heater **62** being removable from the casing, permits the use of heating elements of various sizes, in other words, type of resistant wire, number of turns, amount of insulation, so that the heater element may be balanced with the wattage of the line load so as to produce the amount of heat desired to actuate expansion arm **42** and thus break the circuit within the time desired.

In view of the foregoing description taken in conjunction with the accompanying drawing it is believed that a clear understanding of the construction, operation and advantages of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A delayed action switch comprising a non-conductive casing, a pair of rigid contact terminals carried by said casing on one side and adapted to be connected to a circuit, a non-conductive lever mounted in said casing, a pivot pin securing said lever to said casing, a contact member carried by said casing opposing one of said contact terminals, a conductive shaft carried by said lever spaced parallel to said pivot pin and connecting one of said contact terminals to said contact member upon actuation of said lever in one direction, a flexible thermostatic arm supported by said casing and disposed within said casing engaging said lever, and means operatively connected to said contact terminals for selectively expanding said thermostatic arm to disengage said lever upon actuation of said lever in one direction.

2. The combination of claim 1 wherein said means includes a heating coil mounted within said casing and connected to said contact member and one of the contact terminals.

3. In an electrical lighting apparatus including a circuit and a toggle switch, said toggle switch having an actuating arm, a delayed action switch comprising a non-conductive casing, an upper and lower contact terminal rigidly carried by said casing, conductive brackets carried by said contact terminals and secured to the terminals of the toggle switch, a contact member carried by said casing opposing said lower contact terminal, a non-conductive lever pivoted on said casing for movement between said lower contact terminal and said contact member, a contact shaft carried by said lever contacting said lower contact terminal and said contact member upon actuation of said lever in one direction, a thermostatic arm pivoted in said casing engaging said lever, a removable heating coil mounted in said casing and connecting said upper contact terminal to said contact member for expanding said thermostatic arm to disengage the latter with said lever upon actuation of said lever in one direction, spring means urging said lever into normal circuit open position, and a switch box for said switches and having a cover having a pair of slots therein slidably receiving the lever and the actuating arm of the toggle switch.

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