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P. P. KAUFMAN
DELAYED SWITCH ACTION

1,698,548

Filed April 9, 1926

Fig. 1

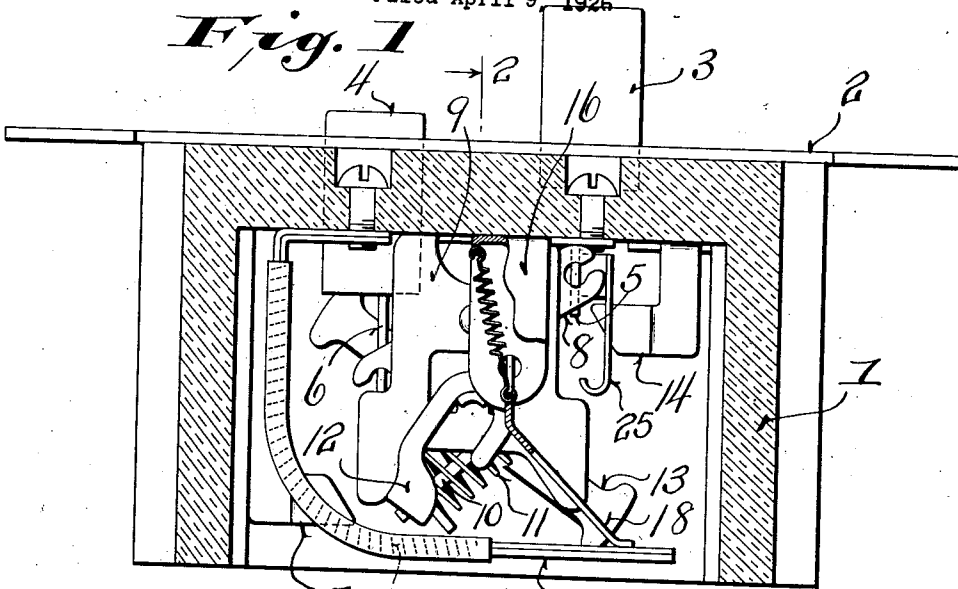


Fig. 2

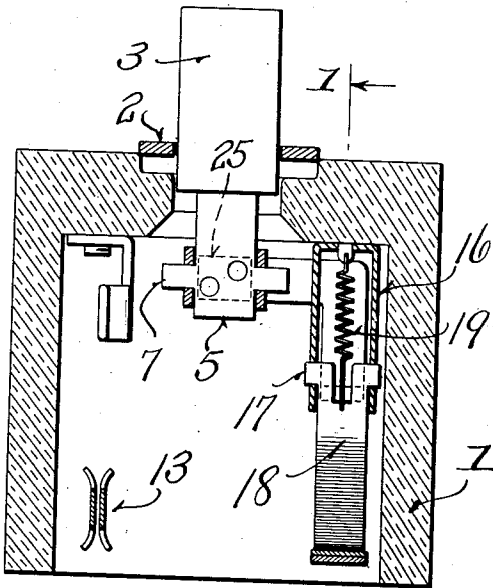


Fig. 3

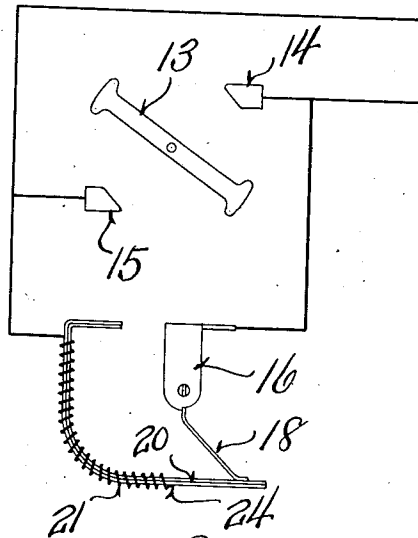
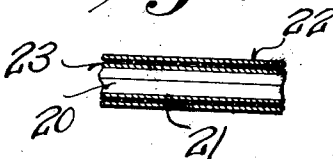


Fig. 4



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DELAYED SWITCH ACTION.

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This invention relates to a delayed action switch. It frequently happens that it is not desirable to immediately extinguish an electric light upon operation of the switch. For example, in garages, it is desirable to have the light extinguished after the owner has locked the garage. This is not usually possible with the ordinary installations, although it has been sometimes accomplished by the use of two-way switches located at different points. Obviously, there are numerous instances under which a delayed action switch is desirable. For example, it is frequently desirable to cut off the light before retiring while having a small interval during which the light still burns after the switch has been operated—thus permitting the operator to retire with the light on even after he has operated the switch.

This invention is designed to provide a delayed action switch which is complete in itself and which avoids the necessity for two-way switches or other complicated wiring, and which permits the operator to open the switch without extinguishing the light, the light being subsequently extinguished by the automatic delayed operation of the switch.

Further objects are to provide a switch which will have a quick break for the delayed action, which is of such construction that it may be readily mounted in the usual porcelain or other housings without requiring a large amount of room, but which, on the other hand, is so constructed that it may be mounted in a conventional type of housing.

Further objects are to provide a very simple type of switch which is highly practical, which is reliable, and which is substantially fool proof.

An embodiment of the invention is shown in the accompanying drawings, in which:—

Figure 1 is a sectional view longitudinally of the switch, such view corresponding approximately to a section on the line 1—1 of Figure 2.

Figure 2 is a transverse sectional view

approximately on the line 2—2 of Figure 1.

Figure 3 is a diagram of the connections of the switch.

Figure 4 is an enlarged sectional view through the thermostatic element.

Referring to the drawings, it will be seen that the usual porcelain or other casing 1 has been illustrated. This casing is provided with an attaching front strip 2 of metal and carries the operating buttons 3 and 4. These operating buttons carry plungers 5 and 6 which, as may be seen from Figure 2, are provided with outwardly projecting ears 7.

These ears 7 fit within a rocking frame 8 which is pivotally mounted in a stationary frame 9. This rocking frame may be of the conventional form and carries one end of a rod 10 and also furnishes a seat for one end of a compression spring 11. The other end of the rod passes through a yoke 12 which is pivotally carried by the stationary frame 9. This yoke carries the movable contact or blade 13 which is preferably insulated therefrom in the usual manner. This blade 13 is, therefore, adapted to snap into either of two extreme positions. In the position shown in Figure 1, the switch is open with regard to this blade. The ends of the blade are adapted to receive the stationary contracts 14 and 15 when the switch is closed.

The structure thus far described is the conventional type of snap switch.

An auxiliary U-shaped stationary frame 16 is secured within the casing 1 by means of countersunk screws as illustrated. This frame receives the outwardly projecting pivotal lugs 17 of a lever or member 18 as shown most clearly in Figure 2. This member is preferably cut away between the trunnions 17 and receives one end of the small tension spring 19. The other end of such spring being carried by a lug formed integral with the U-shaped stationary frame 16. The auxiliary frame 16 is connected to the stationary contact 14 as shown in the diagrammatic view, Figure 3. A thermostatic element, such as indicated at 20, is secured

to the casing 1 by means of a counter sunk screw, as illustrated. This thermostatic element 20 has a horizontal arm positioned in alignment with the lever 18. It is wrapped 5 with a heating coil 21, and such heating coil may be covered by a suitable sheet 22 on its outer side, and may be separated from the thermostatic element by a thin sheet 23 as shown in Figure 4. One end of the heating 10 coil 21 is attached, as indicated at 24, to the thermostatic element 20. The other end of the heating coil is attached to the stationary contact 15 as illustrated in the diagrammatic view, Figure 3.

15 It is to be noted further that a foot or arm 25 is secured to the plunger 5 as shown in Figures 1 and 2, and is preferably provided with a rounded end positioned in the path of movement of the lever 18.

20 In using the switch, it is snapped on in the usual manner, the blade 13 connecting the contacts 14 and 15. When it is desired to cut out the light, the switch is snapped off as shown in full lines in Figures 1 and 2.

25 However, it is to be noted that when the switch is snapped on, the foot or member 25 rocks the lever 18 into its full line position as shown in Figures 1, 2 and 3, and thus causes the lever 18 to contact with the element 20. Practically no current passes 30 through the coil 21 while the switch is closed as it is passed across the contacts 14 and 15 by means of the blade 13. However, when the switch is snapped open, the current 35 passes through the coil to the thermostatic element 20, and from thence to the lever 18, thus forming a by pass around the switch blade and stationary contacts. In a short interval of time, for instance, two minutes, 40 depending, of course, on the setting and construction of the device, the heating coil sufficiently heats the thermostatic element 20 to cause its outer arm to move inwardly thus rocking the lever 18 inwardly, and position- 45 ing the spring 19 on the other side of the center of the lever 18 from that shown in Figure 1. This causes the lever 18 to quickly snap inwardly away from the thermostatic element, and thus breaks the by 50 pass connection with consequent extinguishing of the light.

It is to be particularly noted that this break secured by the thermostatically controlled portion of the switch is also a quick- 55 break so that no destructive arcing can occur.

When the switch is again used, the lever 18 is rocked into the full line position by means of the foot 25 as previously described.

60 It will be seen that the automatic portion of the switch is of very simple and reliable construction, and is small, and may consequently, be mounted within the usual casing 1 of the switch.

65 It will be seen further that the delayed

action mechanism is very simple and is not likely to get out of order, and that the switch is substantially fool proof. It will, therefore, be seen that a simple and reliable type of delayed action switch has been provided 70 by means of which the operator may open the switch itself and may thereafter be provided with light for a limited period before the automatic mechanism functions.

Although the invention has been de- 75 scribed in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed. 80

I claim:

1. In an electrical switch, the combination of a pair of stationary contacts, a movable member for bridging said contacts, a lever 85 connected to one of said contacts, spring mechanism connected to said lever for quickly moving said lever when said lever has been initially moved, a thermostatic member adapted to contact with said lever and connected to the other of said stationary con- 90 tacts through a heating coil associated with such thermostatic element.

2. An electrical switch comprising a pair of stationary contacts, a quick break manu- 95 ally operable mechanism for bridging said contacts, a pivoted lever connected to one of said contacts, a thermostatic member connected through a heating coil to the other of said contacts and adapted to initiate the motion of said lever, and quick motion mechanism associated with said lever and adapted 100 to complete the movement of said lever when the initial movement has been made by the thermostatic member.

3. An electrical switch comprising a pair 105 of stationary contacts, a quick break manually operable mechanism for bridging said contacts, a pivoted lever connected to one of said contacts, a thermostatic member connected through a heating coil to the other 110 of said contacts and adapted to initiate the motion of said lever, quick motion mechanism associated with said lever and adapted to complete the movement of said lever when the initial movement has been made by the 115 thermostatic member, and a shoe connected with the manually controlled portion of said switch for moving said lever into contact with said thermostatic element.

4. An electrical switch comprising a first 120 and a second stationary contact, a manually movable bridging member adapted to connect said contacts, a lever pivotally supported and connected to said first stationary contact, a spring connected to said lever and 125 adapted to be rocked to either side of dead center, a thermostatic member having a surrounding heating coil connected at one end to such member and at the other end to the second of said stationary contacts, said ther- 130

mostatic member being engaged by said lever when the said spring is on one side of dead center and adapted to rock said lever when said heating coil is energized to place said
5 spring on the other side of dead center, and means associated with said manually movable bridging member for moving said lever into contact with said thermostatic member. In testimony that I claim the foregoing I have hereunto set my hand at Appleton, in 10 the county of Outagamie and State of Wisconsin.

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