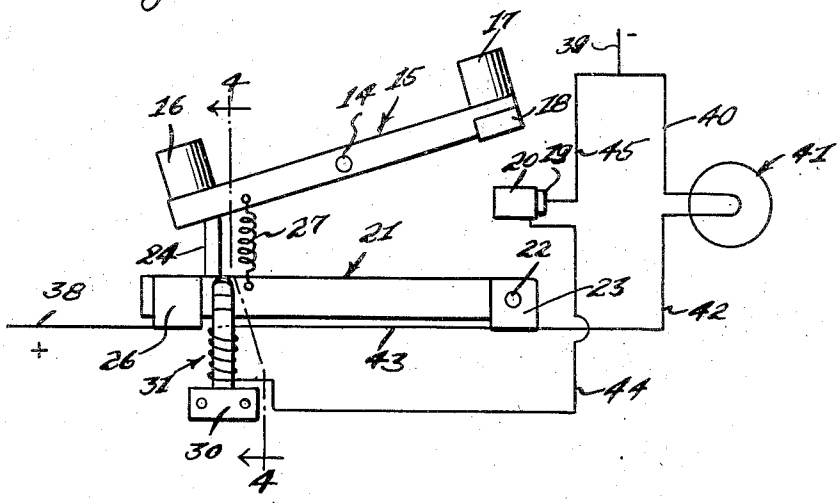
March 17, 1942. W. G. BARRETT 2,276,366

SELF-OPENING SWITCH

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Fig. 1.



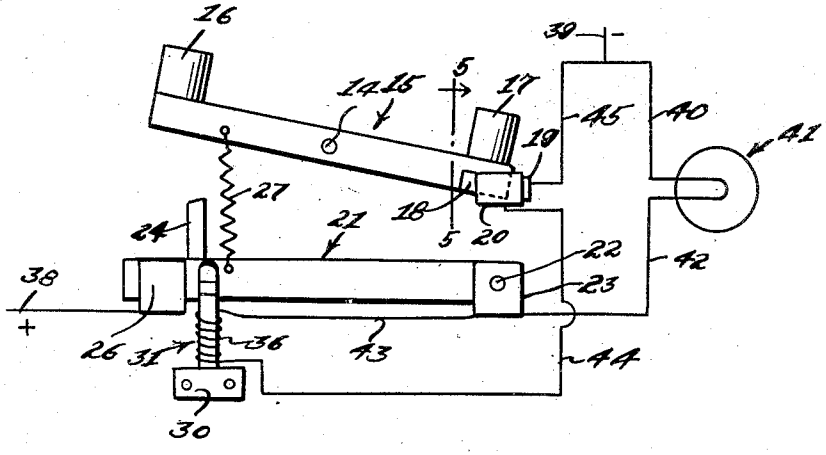


Fig. 2.

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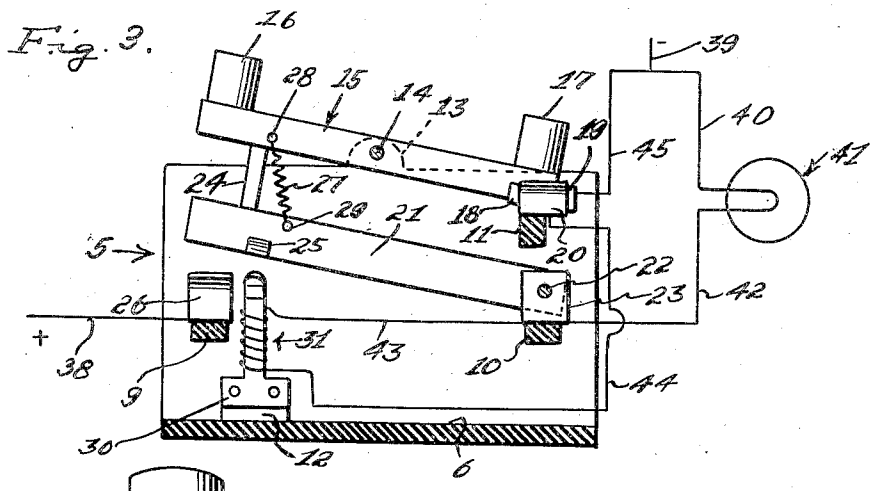
Attorneys

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Fig. 3.



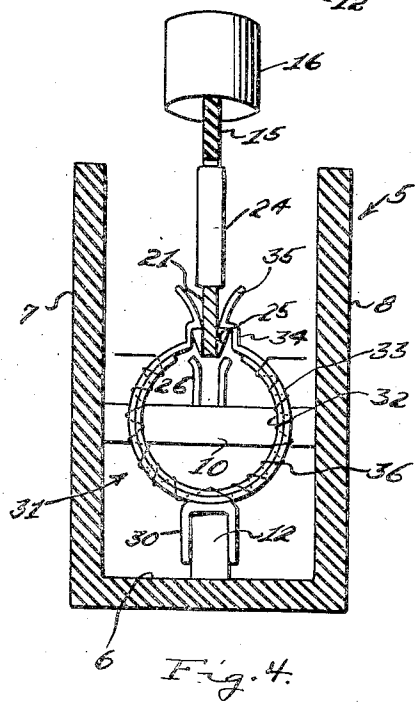


Fig. 4.

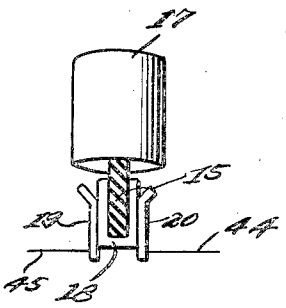


Fig. 5.

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UNITED STATES PATENT OFFICE

2,276,366

SELF-OPENING SWITCH

William Gerald Barrett, Merrill, Wis.

Application December 23, 1940, Serial No. 371,432

1 Claim. (Cl. 200—122)

My invention relates to improvements in electric switches especially adapted for incorporation in house circuits, and arranged so as to remain closed to continue the energization of the utilization means, for a predetermined time after the switch operating means has been manually operated to the off position, and the primary object of the invention is to provide a simple and practical arrangement of this character.

Other important objects and advantages of my invention will be apparent from a reading of the following description taken in connection with the appended drawings, wherein for purposes of illustration a preferred embodiment of the invention is shown.

In the drawings:

Figure 1 is a general side elevational view showing the switch in its on position, closing the circuit between a source of electrical current and the utilization means.

Figure 2 is a similar view of the switch showing the same in an intermediate position with the operating means in the off position and with the energizing circuit still intact.

Figure 3 is a vertical longitudinal sectional view taken through the support and showing the switch in completely off position in which the source is disconnected from the utilization means.

Figure 4 is an enlarged transverse vertical sectional view taken through Figure 3.

Figure 5 is an enlarged sectional elevational view taken through the operating arm adjacent its contact and showing the contact engaged to bridge certain other contacts as described below.

Referring in detail to the drawings, the illustrated embodiment of the invention comprises a suitable casing which is generally designated 5 and is preferably composed of dielectric material involving the bottom 6 and the opposed side walls 7 and 8, respectively, between which extend the transverse horizontal support bars 9 and 10, respectively, which are at substantialy the same elevation above the bottom 6 at points adjacent to the opposite ends of the casing. Spaced above the support 10 is another transverse support bar 11. Intermediate the side walls the bottom has a dielectric block 12 which is spaced equally from the opposite side walls at a point adjacent the left hand end of the casing at a point inwardly of the support bar 9 as clearly shown in Figure 3. Between ears 13 formed on the upper ends of the side walls 7 and 8 there extends a pivot rod 14 on which is pivoted a metal portion of the operating lever which is generally designated 15 and which has push buttons or other suitable handle means 16, 17 on the top thereof adjacent the opposite ends thereof. Below the handle means 17 the lever 15 which is of dielectric material has attached thereto a U-shaped cross section bridging element 18 which is arranged to be frictionally engaged between the contacts 19 and 20 which are mounted on the support bar 11, when the button or handle means 17 is depressed in the position shown in Figure 3 which is the completely off position of the operating element 15.

Aligned below the operating element 15 is a conductive lever 21 which is pivoted at its right hand end by a pivot 22 traversing ears 23 of a conductive post 24 which is supported on the support bar 10. Rising from the left hand end portion of the conductive lever 21 is a dielectric post 24 whose purpose is to keep the operating element 15 and the conductive lever 21 separated at all times. The sides of the lower edge of the lever 21 have inverted triangular cross section detents 25 thereon for a purpose to be described. Longitudinally outwardly of the detents 25 the conductive lever has a portion adapted to reception between opposed ears of a U-shaped contact 26 which is mounted on the support bar 9. A contractile helical spring 27 is stretched between the points 28 and 29 on the operating element 15 and conductive lever 21, respectively. The conductive lever 21 will hereinafter be designated as the switch arm or lever.

Connected to the bight portion of an inverted U-shaped bracket 30 which has its arms attached to opposite sides of the dielectric block 12, is the substantially circular bimetallic thermal control element which is generally designated 31. The thermal element comprises an inner brass or other suitable material annulus 32 which is surrounded by a C-shaped annulus 33, the latter having inverted L-shaped terminals 34 for engagement with the tops of the detents 25 in the manner shown in Figure 4 to hold the main switch arm 21 in engagement with the contact 26' under conditions to be described. Guide portions 35 on the inverted L-shaped portions 34 are positioned divergently so that the angulated faces of the detents 25 will cam the portions 34 apart to permit seating of the detents. A coil of suitable wire 36 is wound on the thermal elements 32 and 33 for heating the same. By varying the amount of wire wound on the thermal elements and by varying the cross section and material of the thermal elements, the time of

opening and the temperature at which the thermal element opens may be predetermined.

In the arrangement shown in the drawings one side of the current source, (not shown) is connected by the wire 38 with the contact 26. The remaining side of the source is connected by the wire 39 with the wire 40 which leads to one side of the utilization means 41, the remaining side of the latter being connected by the wire 42 with the contact 23. A wire 43 connects the contact 23 with one side of the heating coil 36 on the thermal control element 31, the remaining side of the heating coil 36 being connected by the wire 44 with the contact element 20 on the support bar 11. A wire 45 connects the contact 19 on the bar 11 with the current source wire 39.

Referring to Figure 3 of the drawings, showing the switch in the completely "off" position with the "off" button 17 depressed, the contact 18 is engaged between and bridging the contacts 19 and 20 and the spring 27 has swung the main switch arm 21 upwardly toward the operating lever 15 as far as the post 24 will permit. In the described position of the switch arm 21 the switch arm is disengaged both from the thermal element 31 and from the contact 26. To close the switch to connect the utilization means 41 with the source of current, the button 16 is depressed from the position shown in Figure 3 so that the left hand end of the switch arm 21 is depressed to engage the detents 25 under the holding portions of the thermal element and to engage the contact 26 in the position shown in Figure 1 of the drawings. In this position the contact 18 is upwardly withdrawn from engagement between the contacts 19 and 20. In this position of the parts, the current flows along the wire 38 through the contact 26 and through the switch arm 21 to the conductive bracket 23 and thence through the wire 42 to the utilization means 41, such as an electric bulb, thence along the wire 40 to the remaining source wire 39. In this way the utilization means 41 is energized. The operator of the switch may then depress the "off" button 17 to reengage the contact bridge 18 between the contacts 19 and 20 in the position shown in Figure 2, so as to bring into the circuit via the wires 45 and 44 and the wire 43, the heating coil 36 on the thermal element 31. The passage of the current through the heating element on the thermal element 31 causes the arms of the thermal element to spread apart after a predetermined lapse of time so as to release the detents 25 and permit the spring 27 to pull the switch arm 21 upwardly toward the operating element 15 and thereby disengage the switch arm 21 from the contact 26 and open the circuit to the utilization means, the parts of the switch thereby assuming the positions shown in Figure 3. In this way energization of the utilization means is maintained for a predetermined length of time after the operating element has been operated to an "off" position.

Although I have shown and described herein a preferred embodiment of my invention, it is to be definitely understood that I do not desire to limit the application of the invention thereto except as may be required by the scope of the subjoined claims.

Having described the invention, what I claim as new is:

In a thermostatically controlled time switch for use in a main circuit including a shunt circuit, a conductive switch arm adapted to be interposed in said main circuit and pivotally mounted at one end for swinging in opposite directions to open and close said main circuit, respectively, a thermostatic member adapted to be interposed in the shunt circuit to be heated thereby and comprising a pair of reactive fingers for gripping opposite sides of said switch arm when the latter is swung into a circuit closing position, said fingers being relatively separative under the action of heat to release said switch arm, a pair of spaced contacts adapted to be interposed in said shunt circuit and to be bridged to close said shunt circuit, means to swing said switch arm into a circuit closing position comprising a bar-like element pivotally mounted intermediate its ends for rocking movement in opposite directions, a pick-up connection between said element and arm whereby rocking of the element in one direction swings said arm into a circuit closing position, a spring connection between said element and arm whereby rocking of the element in the opposite direction tensions said arm for swinging when released into a circuit opening position, and a bridge on one end of said element for bridging said contacts under rocking of said element in said opposite direction.

WILLIAM GERALD BARRETT.