Feb. 26, 1952 R. E. SMITH 2,587,399

MOMENTARY CONTACT ELECTRIC SWITCH

Filed Dec. 13, 1948 2 SHEETS—SHEET 1

Fig. 1.

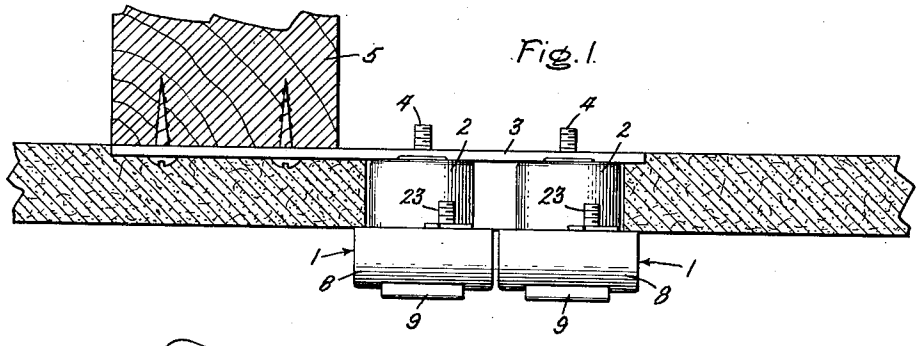


Fig. 2.

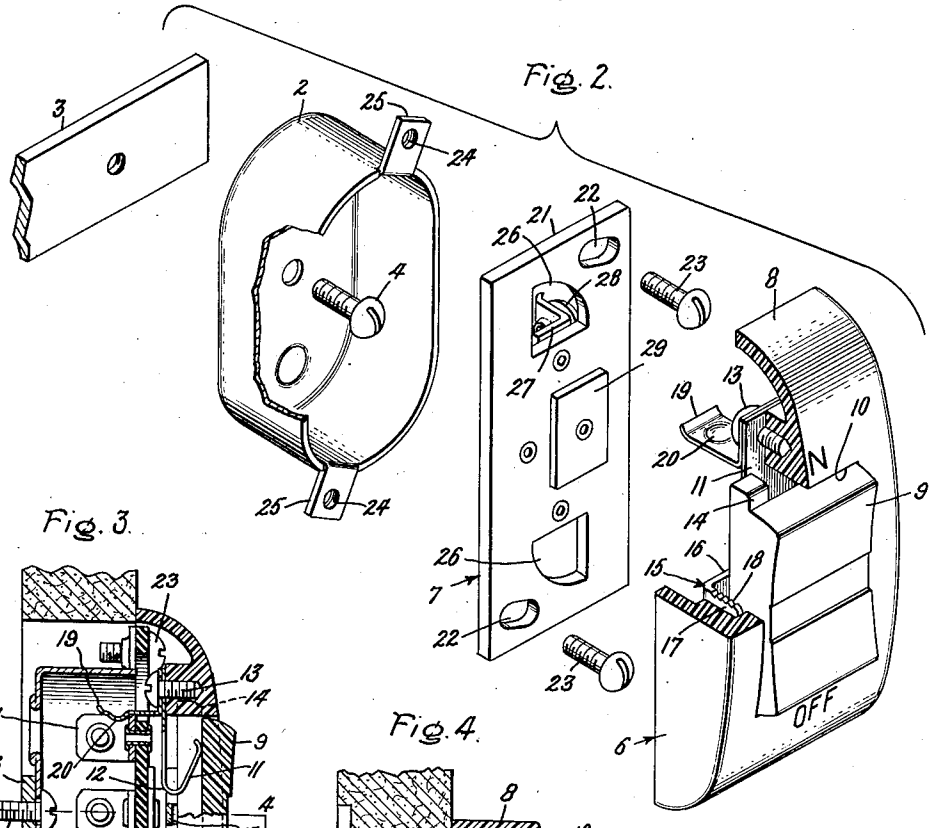


Fig. 3.

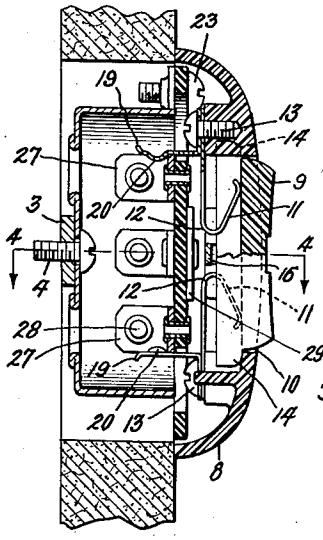
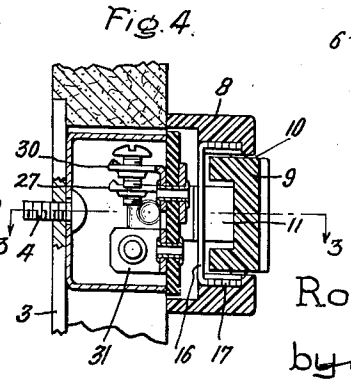


Fig. 4.



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MOMENTARY CONTACT ELECTRIC SWITCH

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Fig. 5.

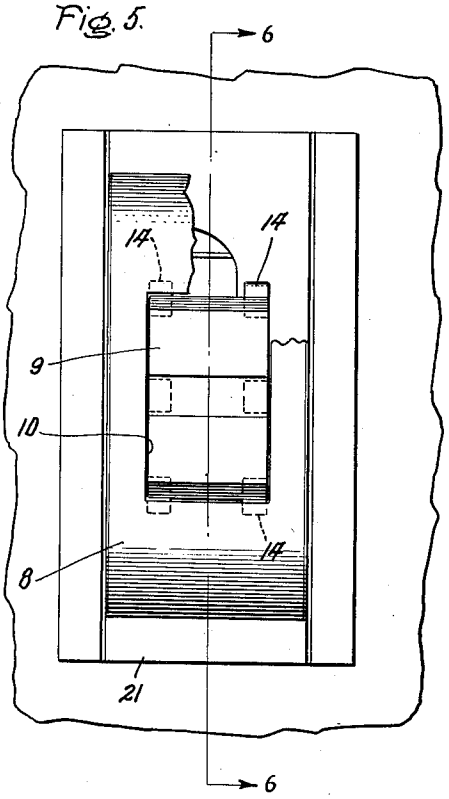


Fig. 6.

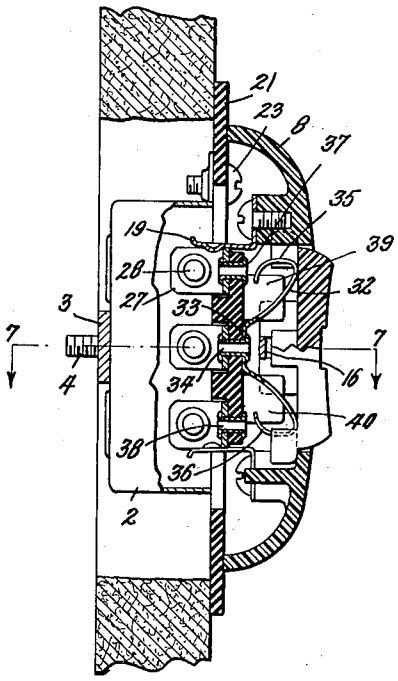
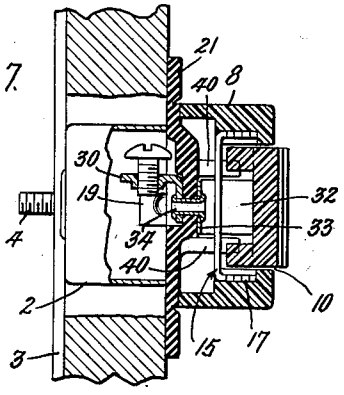


Fig. 7.



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Patented Feb. 26, 1952

2,587,399

UNITED STATES PATENT OFFICE

2,587,399

MOMENTARY CONTACT ELECTRIC SWITCH

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Application December 13, 1948, Serial No. 65,046

6 Claims. (Cl. 200—159)

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This invention relates to improvements in electrical switches and more particularly to double momentary contact switches for use in low voltage control circuits as for the operation of off-on relays for remote control of lighting circuits and the like.

It is an object of this invention to provide a switch of the nature described above which is small, compact, easily installed, easily assembled, and readily adaptable to low cost manufacturing methods.

The above and other objects of the invention and the manner of carrying out the same will be understood from a consideration of the following description and the accompanying drawing wherein: Fig. 1 is a plan view of the assembled unit mounted on a supporting surface; Fig. 2 is a partially disassembled perspective view with portions cut away of one form of my invention; Fig. 3 is a cross-sectional view of the switch taken on line 3—3 of Fig. 4. Fig. 4 is a cross-sectional view of the switch taken on line 4—4 of Fig. 3. Fig. 5 is a plan view of an alternate form of my invention. Fig. 6 is a cross-sectional view taken on line 6—6 of Fig. 5. Fig. 7 is a cross-sectional view taken on line 7—7 of Fig. 6.

Fig. 1 shows two identical switches 1 mounted respectively on two suitable boxes 2 which are secured to a mounting bracket 3 by screws 4. The mounting bracket 3 is secured to the studding 5 by screws or other suitable means. The combined thickness of box and bracket is preferably equal to the customary plaster or wall board thickness, namely about one-half inch.

As shown in Figs. 2 to 4, the switch 1 comprises two separable members which I have designated as the housing assembly 6 and the mounting plate assembly 7 respectively. The assemblies 6 and 7 are designed in such a manner that the mounting plate assembly 7 may first be secured to the box 2 and the housing assembly 6 thereafter snapped on to the mounting plate assembly 7, the two cooperating to close alternatively one or the other of two circuits as will be hereinafter described.

Referring to the housing assembly 6, as shown in Figs. 2 and 3, an elongated, recessed housing 8 of insulating material has an opening 10 merging with the recess. A rocking plate 9 also of insulating material and recessed on its lower face is mounted in the housing projecting through the opening 10 and capable of actuation from the front of the housing. A pair of movable contacts 11 is mounted within the recess in the housing 8. These contacts each comprise a U-shaped strip

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of spring metal having arms of unequal length. The longer arm of each contact 11 is fastened to the housing by means of screws 13 or the like threaded into bosses extending outwardly from the bottom of the housing recess. The curved portions 12 of the U-shaped contacts 11 thus face each other. The shorter free arms of the contacts press against the under side of the rocking plate 9 near its ends. Projecting from the ends of the plate 9 are projections 14 which are biased against the under surface of the housing 8 by the pressure of the movable contacts 11. Thus when one end of the rocking plate 9 is depressed against the action of the movable contact under that end, the projections at the other end act as pivots bearing against the under surface of the housing 8.

To prevent a force at the center of the rocking plate 9 from depressing both movable contacts 11 at the same time, a U-shaped member 15 is provided having a base portion 16 positioned transversely in the housing interior and legs 17 formed with teeth 18 for securing the legs in appropriate recesses in the housing interior on both sides of said rocking plate.

Also mounted on the interior of the housing are contact clips 19, one arm of each being secured to the interior of the housing 8 by the same screws 13 as secure the movable contacts 11 and the other arm being bent at a right angle and formed with a curved portion 20 as shown in Figs. 2 and 3. These clips 19 serve to establish electrical contact between the movable contacts 11 and terminal members on the mounting plate assembly 7 as explained below.

The mounting plate assembly 7, as shown in Figs. 2 and 3, comprises a rectangular mounting plate 21 of insulating material having two elongated slots 22 suitably positioned to secure the mounting plate 21 to the box 2 by means of screws 23 passing through the slots 22 and into the threaded holes 24 in the ears 25 of the box. Spaced perforations 26 are provided in the mounting plate 21. Adjacent to these perforations 26 and on the opposite side of the mounting plate from the housing assembly, I have provided two L-shaped terminal members 27, one leg of each being secured to the mounting plate by a rivet or other suitable means, and the other leg of each being provided with a terminal screw 28. These L-shaped terminal members 27 are positioned to slightly overlap the edge of the perforations 26 which are shaped and positioned to receive the contact clips 19 for the purpose of not only securing the housing assembly 6 to the

mounting plate 7, but also making electrical contact with the terminal members 27 and thus completing a circuit from the terminal members to the movable contacts 11.

As can be seen in Fig. 3, on the same side of the mounting plate as the housing 6 and below the movable contacts, a contact plate 29 is secured to the mounting plate 21 by a rivet or other suitable means which also secures an L-shaped common terminal member 30 located on the other side of the mounting plate. Thus when either end of the rocking plate 9 is depressed, the movable contact under that end makes contact with the contact plate 29, whereby a circuit is completed between one or the other of the terminal members 27 and the common terminal member 30.

An additional terminal means 31 not connected with other contact members may also be provided on the side of the mounting plate opposite the contact plate for splicing purposes.

In Figs. 5–7 inclusive, I have shown an alternative form of my invention. In this form, I provide a resilient contact member 32 centrally located under the rocking plate 9 and having a central portion 33 secured to the mounting plate 21 by means of a rivet 34, or other suitable conducting means, passing through an aperture in mounting plate 21. Rivet 34 also secures terminal 30 located on the opposite side of mounting plate 21 from contact member 32 and electrically connected to the latter by means of rivet 34. The free ends of resilient contact member 32 are bent to form opposed U-shaped movable spring contacts 35 and 36 pressing against the under surface of rocking plate 9.

Two rivets 37 and 38, made of any suitable conducting material, are respectively located beneath movable spring contacts 35 and 36. Rivets 37 and 38 pass through suitable apertures in mounting plate 21 and secure terminals 27 to the plate.

Thus when one end of rocking plate 9 is depressed, movable contact 35 is pressed against rivet 37 and an electrical circuit is completed between the common terminal 30 and one of the terminals 27. When the other end of rocking plate 9 is depressed movable contact 36 is pressed against rivet 38 and an electrical circuit is completed between the common terminal 30 and the other of terminals 27.

The U-shaped member 15 is again provided to prevent a force at the center of the rocking plate 9 from closing both circuits at the same time. Also, pairs of bosses 39 and 40 are provided in mounting plate 21 and located one pair beneath each end of rocking plate 9. These bosses provide additional positive stop means for the respective ends of rocking plate 9 as they are depressed to close the switch contacts.

In this alternative form of my invention, as shown in Figs. 5–7 inclusive, clips 19 are no longer needed to provide electrical connection between terminals 27 and the movable contacts 35 and 36 since such connection is now provided by means of the rivets 37 and 38. Therefore, in this form of my invention, clips 19 serve only the single purpose of securing housing 8 to mounting plate 21.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electrical switch comprising a hollow perforated housing, a rocking plate mounted in said housing and capable of actuation through said perforation, a pair of movable spring contacts located one beneath each end of said rocking plate and secured to the interior of said housing whereby either one of said movable spring contacts may be depressed, a contact plate against which said movable contact springs may be pressed to close a circuit, said contact plate being mounted on a mounting plate of insulating material, means for securing said mounting plate to an outlet box, terminal means on said mounting plate, means providing electrical contact between said movable spring contacts and said terminal means comprising two stationary spring clips mounted on the interior of said hollowed housing each electrically connected to one of said movable spring contacts, spaced perforations in said mounting plate adapted to receive said stationary spring clips, said terminal means on said mounting plate being spaced to make electrical contact with said stationary spring clips protruding through said perforations in said mounting plate, and additional terminal means on the opposite side of said mounting plate from said contact plate, one of said means being electrically connected to said contact plate.

2. An electrical switch comprising a hollow perforated housing, a rocking plate mounted in said housing and capable of actuation through said perforation, a pair of movable spring contacts located one beneath each end of said rocking plate and secured to the interior of said housing whereby either one of said movable spring contacts may be depressed, a contact plate against which said movable contact springs may be pressed to close a circuit, said contact plate being mounted on a mounting plate of insulating material, means for securing said mounting plate to an outlet box, terminal means on said mounting plate, means for mounting said housing on said mounting plate and for simultaneously providing electrical contact between said movable contacts and said terminal means, said mounting means and said electrical contact means comprising two stationary spring contacts mounted on the interior of said hollowed housing and each electrically connected to one of said movable spring contacts, spaced perforations in said mounting plate adapted to receive said stationary spring contacts, said terminal means on said mounting plate being spaced to make electrical contact with said stationary spring contacts protruding through said perforations in said mounting plate, and additional terminal means on the opposite side of said mounting plate from said contact plate one of said means being electrically connected to said contact plate.

3. A multiple circuit control switch for selective alternate closure of either one of two separate circuits including a hollow perforated housing, an elongated rocking plate mounted in said housing and capable of actuation through said perforation, projections on both of the elongated ends of said rocking plate, said projections being arranged to contact the inside surface of said housing and to act as pivot members when one elongated end or the other of said rocking plate is depressed, contact means located beneath said rocking plate, spring contact means positioned above said contact means, said spring contact means being arranged to bias said projections of said plate against the inside surface of said housing and to be pressed against said contact means to close a circuit when either end of said rocking plate is depressed, stop means positioned

beneath and intermediate the ends of said rocking plate for preventing simultaneous closure of circuits by both ends of said rocking plate, a mounting plate having apertures therein, and resilient strips secured to each end of said housing to pass through said mounting plate apertures thereby gripping said mounting plate and locking said housing thereto.

4. In a multiple circuit control switch for selective alternate closure of either one of two separate circuits, a hollow perforated housing, an elongated rocking plate mounted in said housing and capable of actuation through said perforation, a pair of U-shaped, movable contacts, one end of each being secured to the interior of said housing and the other free end of each pressing against said rocking plate, said spring contacts being located respectively beneath the elongated ends of said rocking plate whereby either one of said contacts may be selectively depressed, a contact plate for establishing an electrical connection with said contacts as they are selectively depressed for selective, alternate closure of either one of two separate circuits, a stop means located beneath said rocking plate and intermediate the elongated ends thereof for limiting movement of said rocking plate to prevent simultaneous depression of said contacts.

5. A multiple circuit control switch for selective alternate closure of either one of two separate circuits including a hollow perforated housing, an elongated rocking plate mounted in said housing for actuation through said perforation, projections on each of the elongated ends of said rocking plate arranged to contact the inside surface of said housing and to act as pivot members when one elongated end or the other of said rocking plate is depressed, contact clips secured to

the inside surface of said housing to include a portion extending perpendicularly thereto, spring contact means positioned to bias said projections of said rocking plate against the inside surface of said housing, a mounting plate having apertures and contact means with the latter being adapted to be contacted by said spring contact means thereby closing a circuit to said contact means when either end of said rocking plate is depressed, stop means positioned beneath said rocking plate for preventing simultaneous closure of circuits by both ends of said rocking plate, and means including said contact clips cooperating with said apertures in said mounting plate for securing said perforated housing to said mounting plate.

6. A claim in accordance with claim 5 wherein said spring contact means is secured to said mounting plate for electrical engagement with said contact means when either end of said rocking plate is depressed.

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