June 20, 1939. E. J. MASTNEY 2,162,895

ELECTRIC SWITCH

Filed Sept. 8, 1937

Fig. 1

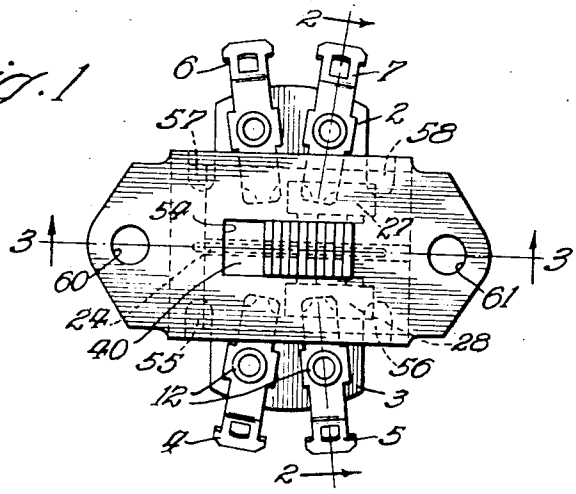


Fig. 2

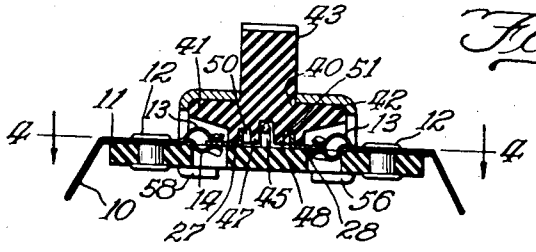


Fig. 3

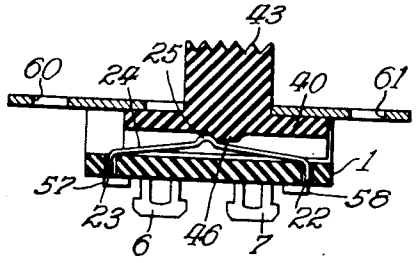


Fig. 4

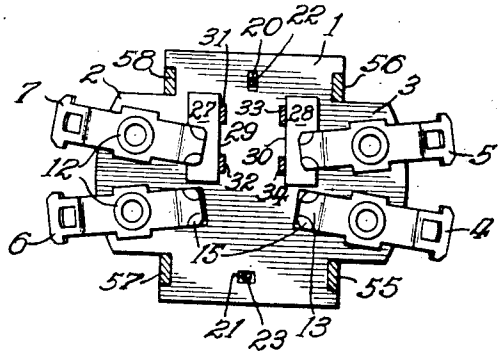
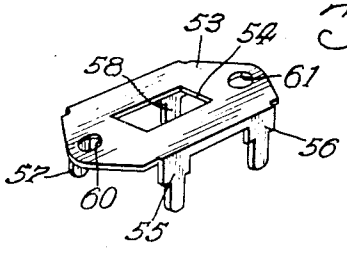


Fig. 5



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ELECTRIC SWITCH

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Application September 8, 1937, Serial No. 162,881

9 Claims. (Cl. 200—16)

This invention relates to an electric switch and more particularly to a simple and effective switch for controlling a plurality of electric circuits. The switch herein described is characterized by a longitudinally movable contact, which is full-floating and which may adapt itself to any irregularities. The switch is further characterized by a simple and effective index mechanism which is mechanically and electrically separate from the switching portion of the system.

Referring to the drawing, Figure 1 is a top view looking down upon the switch. Figure 2 is a section along line 2—2 of Figure 1. Figure 3 is a section along line 3—3 of Figure 1. Figure 4 is a section along line 4—4 of Figure 2. Figure 5 is a detail.

The switch comprises an insulating base 1 of any suitable material such as Bakelite having any desired shape. As shown here, base 1 is provided with opposing wings 2 and 3, upon which are mounted stationary contacts 4 to 7 inclusive. Each contact is preferably formed of a doubled strip of spring metal, having one end 10 shaped to provide a soldering lug and an intermediate portion 11 as a mounting portion. Each contact is rigidly mounted upon base 1 by means of an eyelet 12, passing through a suitable aperture in the base 1 and in the mounting portion 11 of the contact. The mounting portion 11 extends to form a pair of contact making jaws 13 and 14 oppositely bent with the tips pressed against each other. The corners 15 of each contact making jaw are preferably bent away from the opposing jaw so that the opposing jaws at the corners are provided with lips providing a ready entry of a movable contact.

As clearly indicated in Figure 2, upper jaw 13 of the contact is shaped in a simple curve, while lower jaw 14 is formed in an S curve to clear the insulating base material. The base is suitably apertured at the region below each pair of contact jaws so that lower S-shaped jaw 14 of each contact clears and may be deflected downwardly. The contacts are so arranged that the opposing jaws 13 and 14 tend to meet substantially in the plane of the top surface of base 1. As shown in Figure 4, the various pairs of contacts are mounted at an angle to each other but this is only to provide clearance between the soldering portions. The contacts may, if desired, be mounted parallel to each other.

Base 1 is provided with apertures 20 and 21 on the center line thereof. These apertures are small slots and, as shown in Figure 4, are disposed at right angles to each other. Passing through slots 20 and 21 are the bent ends 22 and 23 of a spring 24, extending between the two slots. This spring is provided with a bumped portion 25 at an intermediate point thereof.

Cooperating with each pair of contacts are movable contacts 27 and 28. These contacts are flat strips of metal long enough to bridge each group of stationary contacts, here shown as two although any number may be used. Each contact 27 and 28 is provided at the inner edges 29 and 30 with a pair of upstanding ears 31 to 34 inclusive.

The actuating member of the switch comprises an insulating block 40 having wings 41 and 42 extending the full length thereof and slidable on base 1. A knob or handle 43 extends upwardly therefrom from the center thereof. The bottom of block 40 is provided with a centrally disposed longitudinal channel 45, which extends for the full length of the block. In an intermediate portion of channel 45, a bump or irregularity 46 is provided. As is clearly evident in Figures 2 and 3, channel 45 is adapted to enclose spring 24. On each side of channel 45, the material of block 40 extends downwardly to form walls 47 and 48.

At spaced points within walls 47 and 48, slots 50 and 51 are provided within the material, these slots being shaped and spaced to accommodate ears 31 to 34 inclusive of the movable contacts. As is clearly evident from the drawing, each movable contact is provided with a pair of ears, each of which engages the slots in insulating member 40. The assembly is maintained intact by means of metal plate 53, having a slot 54 for the accommodation of knob 43. Plate 53 is provided at opposite sides thereof with fingers 55 to 58 inclusive, which are adapted to embrace the sides of insulating base 1 and be bent around the bottom. It is understood that slot 54 in the plate is long enough to accommodate knob 43 in the course of its travel and acts to guide block 40 and to determine the end positions. A pair of apertures 60 and 61 may be provided in the plate for mounting the entire switch.

As shown in Figure 3, bump 25 of the spring is adapted to cooperate with protuberance 46 of the insulating member 40 to provide an index action. In moving switch handle 43, the movable contacts 27 and 28 are forced along from one position to the other and spring 24 is depressed to permit bump 25 to clear the protuberance 46. As soon as the spring bump has passed beyond the protuberance, the spring rises against the side of the protuberance. The movable contacts lie on insulating base 1 and are merely moved

back and forth by insulating block 40. It is clear, therefore, that the movable contacts will adapt themselves to any irregularity and tend to provide a full-floating, movable contact. Any dirt in the switch will be pushed from between the stationary contact jaws and tend to fall out through the apertures in the insulating material.

What is claimed is:

1. A switch comprising an insulating base having a plurality of stationary contacts mounted thereon and having a movable contact slidably disposed thereon and movable in a straight line on the base for switching purposes, a spring carried by said base and extending parallel to the line of motion of said contact, said spring having a portion up from the base, an insulating block slidably disposed on said base, said block having a channel therein, in which said spring is adapted to ride, means for loosely coupling said movable contact and said block so that both move on the base together and means on said block cooperating with said spring for defining index positions for said block.

2. An electric switch, comprising an insulating base having a plurality of stationary contacts mounted thereon and at least one movable contact slidably disposed on said base and movable in a straight line thereon for switching purposes, an elongated spring carried by said base lengthwise thereof and parallel to the direction of motion of said movable contact, said spring having a bump formed thereon, a movable block slidable on said base and loosely engaging said contact for movement therewith, said block having a longitudinal channel, within which said spring rides, said channel having a protuberance therein at an intermediate portion thereof whereby said spring and block cooperate to provide an index action.

3. An electric switch, comprising an insulating base having a plurality of stationary contacts mounted thereon, each contact having a pair of opposed spring jaws movable perpendicular to said base with said base apertured to clear said contacts, at least one movable contact slidably disposed on said base, an elongated spring carried by said base and extending upwardly therefrom along a line parallel to the direction of motion of said movable contact, and an insulating block slidably disposed on said base and having a channel engaging said spring and having means for loosely engaging said movable contact, said spring having an irregularity thereon and said channel having a corresponding irregularity therein, whereby an index action is obtained during switching movements.

4. An electric switch, comprising an insulating base having a plurality of stator contacts mounted thereon, each contact including a pair of spring jaws movable perpendicular to said base, with said base apertured to clear said contacts, at least one movable contact slidably disposed on said base and rectilinearly movable for switching purposes, said base having a pair of apertures therein along the line parallel to the movement of said movable contact, a wire spring having its ends disposed in said apertures and extending along said base with a portion thereof bent to provide a bump, an insulating block slidably disposed on said base having a channel adapted to engage said wire spring with an irregularity in said channel cooperating with said spring bump to provide an indexing action, and means whereby said insulating block loosely engages said movable contact for switching purposes.

5. The structure of claim 4, wherein one of the spring anchoring apertures in said base is wider than the other to permit said spring some degree of transverse movement.

6. An electric switch, comprising an insulating base having a plurality of stationary contacts mounted thereon, each contact having a pair of opposed spring jaws movable perpendicular to the base with said base apertured to clear said jaws, at least two movable contacts slidable on said base and movable in a straight line for switching purposes, said contact having at least one ear extending upwardly therefrom, an insulating block slidably disposed on said base and movable parallel to said contact, said block adapted to engage the ear of said contact and move the same for switching purposes, an elongated spring disposed on said base with the spring extending parallel to the direction of motion of said movable contact, said insulating block having a channel therein in which said elongated spring rides and means whereby said spring and block cooperate to provide an index action.

7. The structure of claim 6, wherein the index action providing means comprises a bump on said spring and an irregularity in said channel.

8. The structure of claim 6, wherein said movable contact has a pair of ears extending upwardly therefrom and wherein said insulating block is provided with slots to engage said ears and wherein the index action providing means comprises a bump in said spring and an irregularity in said channel.

9. An electric switch comprising an insulating base having a plurality of stator contacts mounted thereon, each contact having a pair of opposing spring jaws adapted to open perpendicular to said base, with the base apertured to clear said jaws, at least one elongated movable contact adapted to cooperate with said stationary contacts movable lengthwise thereof, said movable contact being provided with a pair of ears, an elongated wire spring carried by said base parallel to the line of travel of said movable contact, said spring having a bump thereon, an insulating block disposed on said base and having slots engaging said movable contact ears and having a channel in which said spring rides with an irregularity in a portion of said channel for obtaining an index action, and a cover plate for maintaining said insulating block against said base and defining the limits of travel of said block along said spring.

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