Aug. 20, 1946. L. L. YOUNG 2,406,122

LOW VOLTAGE HIGH CURRENT SWITCH

Filed Feb. 23, 1942

Fig. 1.

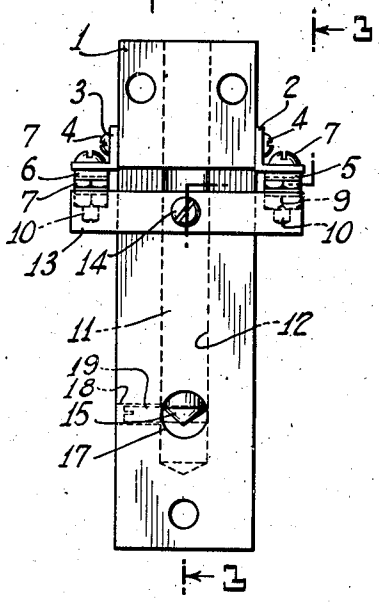


Fig. 3.

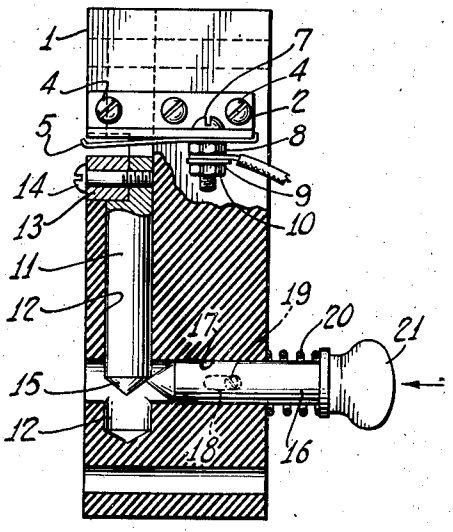


Fig. 2.

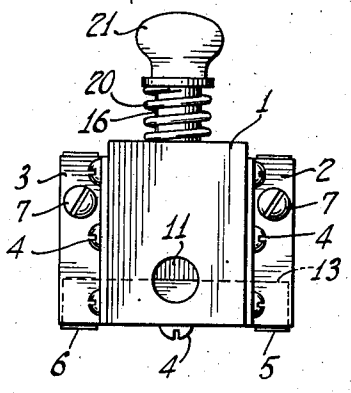
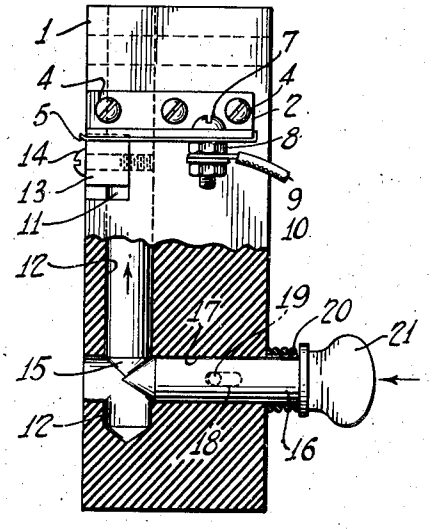


Fig. 4.



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LOW-VOLTAGE HIGH-CURRENT SWITCH

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3 Claims. (Cl. 200—163)

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This invention relates to a new and useful switch for use in electrical circuits, and also deals more particularly with means of interrupting the flow of relatively high currents, such as are used in the heating of the filaments of vacuum tubes employed in a radio transmitter.

An object of this invention is to provide a novel switch which is particularly adapted for breaking a circuit connection of high current, and of relatively low voltage.

Another object of this invention is to provide a simplified and improved switch which has a minimum number of parts and is relatively inexpensive to manufacture, and may be mounted in either a vertical or a horizontal position.

A feature of this invention is the simplified arrangement of a housing member in which two movable rods are actuated at substantially right angles to each other, one of the rods serving as the switch operator, the other rod serving as a movable element to short-circuit two fixed contact members, each one having a spring portion to provide a wiping action.

In the previous practice, switches used to carry relatively high currents, were generally of large physical dimensions, and were not suitable for use in the small space which is generally available on both the panel and the back of the panel of a radio transmitter.

My invention overcomes this difficulty by having a relatively small simple device capable of easy mounting on the panel of a regular transmitter, and also incorporates the desirable wiping action of the contacts, as well as providing a very firm and positive contact therebetween. Although the component parts involved in my invention are not of relatively large dimensions, the opening between the contacts is relatively large.

This invention may best be understood by referring to the accompanying drawing, in which Fig. 1 is a rear elevation of the switch.

Fig. 2 is a plan view of Fig. 1, Fig. 3 is a section of Fig. 1, the section lines being taken at a plane passing through as indicated by the broken line 3. Fig. 4 is a side elevation of Fig. 1.

Referring now in detail to the drawing, a block member 1, is composed of any suitable insulation material, having the necessary insulating qualities and mechanical strength, such as for example, "Bakelite," "Isolantite," and other similar materials. The block member 1 forms the casing, or body, of the switch to which metallic angle-shaped contact supports 2 and 3 are fastened by means of a plurality of screws 4, the

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latter being threaded into member 1. On the forward end of the angle support members 2 and 3 there are mounted relatively heavy spring contact members 5 and 6, which are fastened on one of the legs of the angle by means of a round-head screw 7 and nut 8. Electrical connection is taken off at this point by means of having a flexible lead, or any suitable connection member, clamped between washers 9 and nut 10. A metallic rod 11 is arranged to move up and down within an aperture 12. A heavy metallic bar 13 is secured to rod 11 by means of binding screw 14, thus forming a T-shaped movable member. The lower end of rod 11 is provided with a point which has an angle of substantially 45 degrees as is indicated at 15. A second movable rod 16 is located at substantially 90 degrees from that of rod 11, and is arranged to move within an aperture 17 in member 1. To provide the proper movement and also to prevent accidental removal of rod 16 there is provided in block 1 a longitudinal slot 18 in which extends a pin 19 that is threaded into rod 16. A helical spring 20 is located between the outside of casing 1, and the insulating operating knob 21. It will be noted that in Fig. 3 the contacts are shown in the open position, and in Fig. 4 the contacts are indicated as being in a closed position. The operation of this device is as follows:

When it is desired to close the switch to obtain the position shown in Fig. 4, the operator pushes upon knob 21 moving rod 16 inward until its pointed end rests against the conical surface of rod 11, causing it to rise and to move the bar member 13 to a position in firm contact with each end of the fixed contacts 5 and 6. Through the action of the resilient springs 5 and 6 there is caused a wiping action upon member 13, which presses the spring contacts firmly against the support members 3 and 4. The spring contacts are held in this closed position by virtue of the position of the conical pointed ends of member 11 resting upon the cylindrical surface on a point just beyond the conical end of member 16. To place the switch in the open circuit position shown by Fig. 3, the operator pulls the plunger 16 outward by means of knob 21, allowing the resilient springs 5 and 6 to move away from the fixed support members 3 and 4. This device, while shown with moving rod 11 in a vertical position, may also be held in any other position by virtue of the spring 20, overcoming the force applied through plunger 16. The device may also be mounted on any suitable panel of increased thickness by modifying the length of plunger 16.

Also, the device may be mounted at any convenient distance behind the radio transmitter panel by increasing the length of the operating rod 16. It is preferred that the contacts have silver facings, or any suitable contact material such as tungsten to provide improved contacting action without the danger of sticking due to arcing, or burning, of the contacts, which is frequently encountered when operating a switch with relatively heavy currents. The conical surfaces of members 11 and 16 may be replaced by flat surfaces, which are cut at any other suitable angle than those shown, so as to give the desired bearing and action. The device of this invention may be made with multiple contacts by increasing the length of member 13 and mounting other spring contact members at suitable spaced positions along its surface. This, of course, would increase the width of block member 1. Also, as mentioned above, the switch may be operated in either the vertical or horizontal position.

Although only one form of this invention is shown, it is distinctly understood that it should not be limited precisely thereto.

I claim:

1. A low voltage high current electrical switch comprising a block of solid insulation material having an open transverse slot, a pair of fixed contacts each one of which is secured to a side of said block of insulation material adjacent said slot, said block having two circular apertures therein, a rod-like member having a conical pointed end arranged to move within one of said apertures, a movable contact member secured to the end of said rod-like member opposite its pointed end and arranged to move in said slot, and means including another rod-like member having a conical pointed end located within the other aperture of said block and arranged for the pointed ends to engage each other for moving said first mentioned rod-like member to complete an electrical circuit between said fixed contacts.

2. An electrical switch comprising a block of insulation material having a transverse slot and two circular apertures therein, said circular apertures located at right angles to one another, a pair of spring contacts each one of which is secured to the sides of said block of insulation material adjacent said transverse slot, a movable bar-shaped metallic contact arm arranged to move in said tansverse slot, a rod-like member secured to said contact arm arranged to move in one of said circular apertures, and slidable means within the other circular aperture of said block of insulation material to move with said rod-like member to complete an electrical circuit between said fixed contacts by having said movable metallic contact arm bridge across said fixed contacts.

3. A low voltage high current electrical switch comprising a block of solid insulation material having an open transverse slot, a pair of fixed contacts each one of which is secured to opposed sides of said block of insulation material adjacent said slot, said block having two circular apertures therein, a rod-like member having a conical pointed end arranged to move within one of said apertures, a movable bar-shaped contact member secured to said rod-like member and arranged to move in said slot, and means including another rod-like spring tensioned member having a conical pointed and located within the other aperture of said block, said rods so arranged that the pointed ends engage each other for moving said first mentioned rod-like member to complete an electrical circuit between said fixed contacts.

LLOYD L. YOUNG.