Dec. 9, 1947. C. D. BAYLEY 2,432,370

ELECTRIC SWITCHING DEVICE

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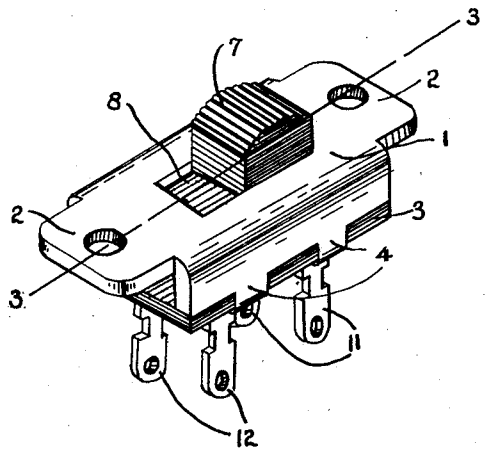


Fig. 1

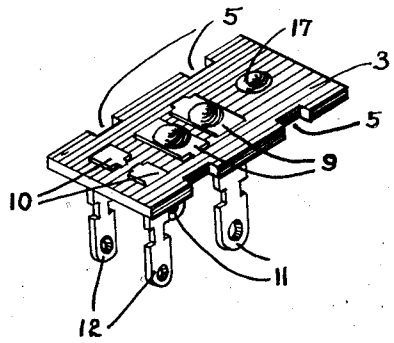


Fig. 2

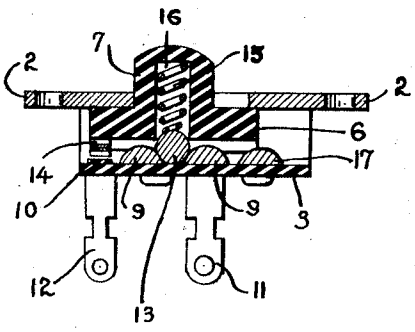


Fig. 3

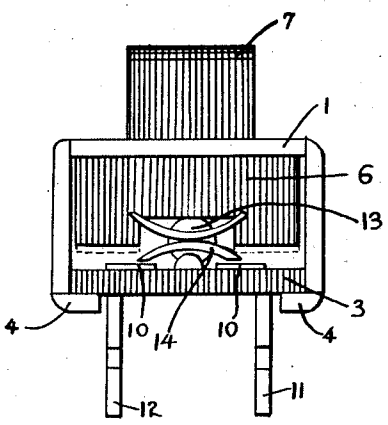


Fig. 4

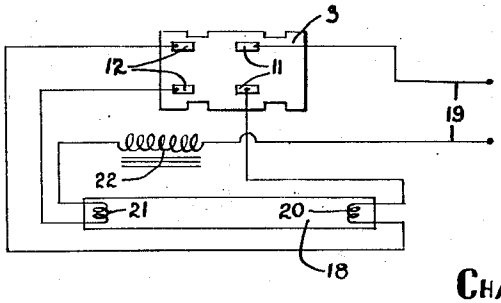


Fig. 5

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ELECTRIC SWITCHING DEVICE

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6 Claims. (Cl. 200—4)

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This invention relates to electrical switches and particularly to switches of the type wherein two separate contactor members are selectively manipulated to successively close two pairs of contacts.

An object of the invention is to provide in one switch means for controlling a plurality of circuits.

A further object of the invention is to provide a multiple control switch of very compact size.

A further object of the invention is to provide a switch which is particularly adapted to the manual starting of electric discharge type lamps.

Other objects and features will more fully appear from the following description taken in connection with the accompanying drawings and will be particularly pointed out in the claims.

In the operation of certain types of electrical devices or installations it becomes necessary to control the flow of current to various portions of the circuit involved. The device of the present invention provides an efficient means for successively closing two independent pairs of circuit connections by manipulation of a single control element. The device has a body portion within which is slidably received a switch operating member of insulating material upon which is mounted two contactor members insulated from each other. A base member of insulating material is secured to the switch body and is provided with two pairs of contacts to which the circuits to be controlled are connected. One pair of contacts is situated in position to be closed by one of the contactors on the slide when it is in its on position, while the remaining pair of contacts are closed by the second contactor by slight movement of the slide in a direction transverse to its sliding movement.

To present a better understanding of the invention a particular embodiment thereof will be described and illustrated in the drawings in which:

Figure 1 is a perspective view of a switch embodying the invention;

Figure 2 is a perspective of the base plate switch;

Figure 3 is a longitudinal cross sectional view on line 3—3 Figure 1;

Figure 4 is an end elevation of the switch; and

Figure 5 is a diagrammatic illustration of one manner of using the switch.

Desirably the body or casing 1 of the switch is made channel shaped in cross section and may be of any suitable metal or other material. At its ends the casing is provided with attaching ears

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2 by means of which the switch is mounted flush upon its attaching surface.

The open side of the channel shaped body 1 is closed by a bottom plate 3 of insulation. The plate 3 may be secured to the body 1 in any suitable manner. As shown in the drawings attaching fingers 4 extend downward from the sides of the casing 1 and into notches 5 in the plate 3. The extremities of the fingers are bent inward over the bottom face of the plate as shown in Figure 4.

The switch operating slide 6 moves within the casing 1 and has an actuating projection 7 extending through an aperture 8 in the front face of the casing 1. The lengthwise dimension of the aperture 8 is greater than that of the projection 7 thereby to permit the slide to move into its on and off positions.

The base plate 3 is provided with two pairs of contacts 9 and 10. The contacts 9 are arranged in series lengthwise of the plate and are provided with soldering lug extensions 11 projecting externally for connection to the circuit. The contacts 10 are arranged in line laterally of the plate 3 and spaced from the contacts 9. The contacts 10 are provided with lugs 12 for connection to a circuit.

The slide 6 is provided with two contactor members 13 and 14 coacting respectively with the contacts 9 and the contacts 10. The contactor 13 may be of any suitable construction and is herein shown as a small metallic ball, which is backed up by an expansion spring 15 received in an aperture 16 extending into the projection 7. The ball 13 extends for a portion of its diameter into the aperture 16 and is thereby caused to move with the slide 6.

When the slide 6 is in its off or right hand position the ball 13 is received between one of the contacts 9 and an abutment 17 on the plate 3. The abutment is not connected to any part of the circuit. When the slide 6 is moved to the left into its on position the ball 13 yields sufficiently to ride over the outer contact 9 and snap into position between the contacts to close the circuit.

The tension in the spring 16 normally maintains the slide against the front wall of the casing 1 which is an important phase in the construction of the device as will appear hereinafter. The contactor 14 is best shown in Figure 4. This contactor is secured in the slide 6 at a position above the contacts 10. The contactor 14 may have any suitable construction. As shown herein it is composed of two flexible curved sections

secured together one section of which is embedded in the material of the slide 6, while the other section is in position to bridge the contacts 10. Normally the contactor 14 is held out of engagement with the contacts 10 by the action of the spring 15. When lateral pressure is exerted upon the slide 6 by pressing upon the projection 7 the slide yields downward bridging the contact 10 thus closing the circuit connected to the contacts 10. To provide for this lateral motion of the slide a substantial clearance is allowed between the bottom face of the slide and the bottom plate 3 with its contact members.

Desirably the contact members 9 and the abutment 17 are convexly shaped so that the action of the switch is smooth and at the same time the slide is firmly held by friction in its on and off positions by reason of the action of the ball 31 which seats either between the two contacts 9 or between one contact and the abutment 16.

The switch above described may be employed for various purposes and is particularly useful for manual starting of a gaseous discharge lamp. Figure 5 of the drawing illustrates diagrammatically the manner of its use for starting a fluorescent lamp 18 which is supplied with power from a suitable commercial circuit 19. One side of the circuit is connected to one of the terminal lugs 11 while the other lug 11 is connected to one end of the filament 20 in the lamp. The other side of the circuit 19 is connected to one side of the other lamp filament 21. A suitable current limiting ballast 22 is inserted in series in the line. The remaining ends of the filaments 20 and 21 are connected to the lugs 12.

To light the lamp the switch is moved into its on position which closes the main circuit leading to one side of the filaments. While the slide is still in its on position the projection 7 is depressed which closes the contacts 10 to energize the filaments. The circuit is held closed for a few seconds to permit the filaments to attain proper electron emitting temperature after which pressure on the member 7 is released which opens the circuit. When the circuit is broken a relatively high voltage is applied between the filament 20 and 21. This voltage is intensified by the discharge of energy from the ballast 22. As a result, a discharge is initiated within the tube. It will be noted that after the discharge is started current flows through the lamp and through the circuit controlled by the contacts 9 until the switch is moved to off position.

What I claim is:

1. A switch having two pairs of fixed contacts, a contactor member manually moveable linearly into on and off positions, means carried by said contactor member for bridging one pair of contacts when said contactor member is moved into on position, a conductor on said contactor member normally laterally spaced from said other pair of contacts when in on position and moveable to bridge them when said contactor member is moved in a direction transverse to its on-off movement.

2. A switch for starting gaseous discharge lamps comprising a housing a contactor slide moveable linearly therein into on-off positions, resilient means for confining its normal movement to a predetermined plane but permitting movement away from said plane upon the application of lateral force, two pairs of insulated contacts on said housing, conducting means carried by said contactor slide for bridging one pair of

said contacts and another conductor on said contactor slide normally laterally spaced from said second pair of contacts when said contactor slide is in its on position said latter conductor being operable to bridge said second pair of contacts upon the application of lateral force to said contactor slide.

3. A switch for starting gaseous discharge lamps comprising, a housing, a switch operating slide of insulating material moveable in said housing, to an on and off position, resilient means for normally causing said slide to move in a predetermined plane but permitting movement out of that plane upon the application of lateral force thereon, a contactor carried by said slide, a base of insulation fixed to the housing, a pair of contacts secured in said base in position to be bridged by said contactor when said slide is in its on position, a second pair of contacts on said base, a second contactor on said slide positioned above said second pair of contacts, when the slide is in on position, whereby when said slide is moved from off to on position by longitudinal force applied thereto the first pair of contacts are bridged and when subsequently applied lateral pressure is applied thereon the second contactor will bridge said second pair of contacts.

4. A switch for starting gaseous discharge lamps comprising a channel shaped housing, a contactor slide of insulating material linearly moveable in said housing into on and off positions, a base of insulating material secured to the open side of said housing, two pairs of contacts fixed in said base, a resilient conductor carried by said slide engaging said base and acting to normally maintain a space between said slide and base and also to bridge one of said pairs of contacts when the slide is in on position, a second conductor normally laterally separated from the other of said pairs of contacts and operable upon the application of lateral force upon said slide to bridge said other pair of contacts.

5. A switch comprising two pairs of fixed contacts, a manually operable contactor member movable linearly into on and off positions, means carried by said contactor member for bridging one pair of contacts when said contactor member is moved into on position and a conductor adapted to bridge the second pair of contacts when said contactor member is moved in a direction transverse to its on-off movement.

6. A switch for starting gaseous discharge lamps comprising a housing, a contactor slide movable linearly therein into on-off positions, resilient means for confining its normal movement to a pre-determined plane but permitting movement away from said plane upon the application of lateral force, two pairs of insulated contacts on said housing, a conducting means carried by said contactor slide for bridging one pair of said contacts when said contactor slide is in its on position and a second conducting means adapted to bridge the second pair of said contacts upon the application of a lateral force to said contactor slide.

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The following references are of record in the file of this patent:

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