

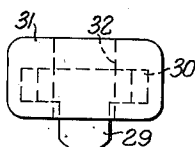
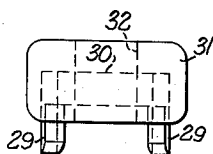
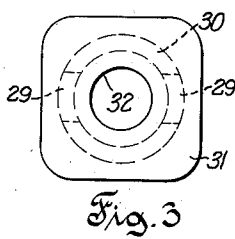
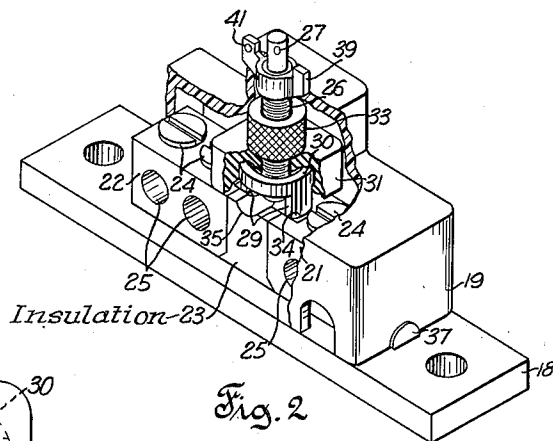
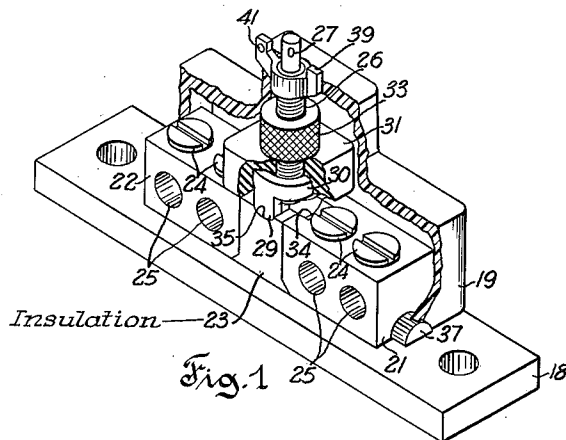
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CURRENT TRANSFORMER SHORT CIRCUITING SWITCH

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CURRENT TRANSFORMER SHORT
CIRCUITING SWITCH

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This invention relates in general to electric switches and in particular to improved apparatus for selectively making or breaking a short circuit across a load circuit.

It is advantageous at times in the application of switch apparatus as in use with current transformers to use such apparatus to short circuit the circuits connected to the transformer. This short circuiting means preferably should be easily and readily disconnectable or removable without necessitating the use of special equipment or tools. The short circuiting element of the switch should not include parts that are likely to wear out or break and thereby cause failure of the switch. The structure should be as simple as possible.

It has been suggested that the structure of the short circuiting means include biasing means to actuate a short circuit contact element. The biasing means and the contact element are likely to wear out or break, thus resulting in a failure and an open circuit when the switch is in a short circuit position. Dangerous conditions which were intended to be avoided are therefore likely to exist.

In other short circuit switch apparatus a non-insulated bolt or screw is provided to secure the short circuit conducting member in its proper position, either the short circuit position or the open circuit position. With such conducting bridging member bolted or screwed into position it is necessary to use a special insulated wrench or insulated screw driver to loosen the bridging member in order to change its position.

The disadvantages of the prior structures can be avoided by providing a common insulated guiding means for the securing means of both the short circuit member and switch cover, and an insulated actuating member for the short circuit member which is rotatably guided by the common insulated guiding means.

It is therefore an object of the present invention to provide an improved electric switch apparatus with a short circuit means.

Another object of the present invention is to provide an improved short circuiting means having an insulated actuating member.

Still another object of the present invention is to provide in a short circuiting electric switch a common insulated guide for a switch cover and for a short circuit bridging member having an insulated actuating member.

Objects and advantages other than those above set forth will be apparent from a consideration of the following description when read in con-

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nection with the accompanying drawings, in which:

Fig. 1 is an isometric projection partially in section of a preferred embodiment of the invention illustrating a switch structure in the open circuit position;

Fig. 2 is a view similar to Fig. 1, illustrating the switch in the short circuit position;

Fig. 3 is an enlarged plan view of the conductive bridging member and insulated actuating member; and

Figs. 4 and 5 are respectively enlarged front and side elevation views of the structure shown in Fig. 3.

Referring more particularly to the drawings by characters of reference, the electric switch shown in Figs. 1 and 2 is provided with a base 18 and with a cover 19, both of insulating material. Two terminal lugs 21, 22 of brass or other suitable conductive substance are mounted in suitable recesses (not shown) provided in the base 18, with an insulation block 23 between the lugs. The block and base insulate the terminal lugs from each other and from any structure on which the switch is mounted; they may consist of separate pieces of material fastened together, but are preferably molded in one piece.

Two parallel extending holes 25 are drilled through each of the terminal lugs. Two of these holes, one in each terminal lug, receives the leads of a first circuit. The other two of the holes, one in each terminal lug, receives the leads of a second circuit. The terminal lugs also have holes drilled and tapped at 90° to the axis of and into the holes 25. Set screws 24 are screwed into the tapped holes to fasten the circuit leads in the terminal lugs.

A stud 26 having one end embedded in the insulation block 23 extends upwardly from the block and base and is thereby insulated from both of the terminal lugs. This stud is threaded and has a small hole 27 at the top thereof for safety wire.

A bridging member of conductive material is provided for short circuiting the terminal lugs and thereby short circuit the circuits connected thereto. Preferably the bridging member is formed in a somewhat saddle shape in that ears 29 extend on opposite sides of a ring portion 30. The ring portion 30 of the bridging member is embedded in a preferably transparent insulation shell 31 which has a bore 32 inside the ring 30. The ears 29 protrude from the insulation shell 31 and are formed with cylindrical contact surfaces. The distance between the two ears is

greater than the width of the insulation block 23 between terminal lugs.

The insulation shell 32 forms an insulated actuating member for the conductive bridging member. The actuating member, with the partially embedded bridging member, slides over the stud 26. The stud extends through a bore 32 of actuating member 31 and serves as a guiding means for the actuating member. The ears 29, which protrude from the actuating member, may make contact with cylindrical contact surfaces of recesses 34 of the terminal lugs.

In the short circuiting position, one ear of the bridging member makes contact with one terminal lug, and the other ear of the bridging member makes contact with the other terminal lug. In the open circuit position, the bridging member is rotated 90° from the short circuit position and the ears of the bridging member rest in cylindrical recesses 35 of the insulation block without making contact with the terminal lugs. To actuate the bridging member from one position to the other, the actuating member is rotated by hand through an angle of 90° about the stud.

The recesses 35, 34, respectively, of the insulating block and of the terminal lugs hold the ears of the bridging member so that the bridging member will tend to stay in either the short circuit or the open circuit position.

The actuating member is secured in either selected position, short circuit or open circuit, by a knurled lock nut 33 which threads on the stud 26 and forces the actuating member and thereby the ears of the bridging member into firm contact with the recessed surfaces of the terminal lugs or of the insulation block.

The cover of the switch is modded preferably from transparent insulating material in shape to conform generally to the outline of the assembled apparatus previously described and to provide quick means for determining position of the bridging member. The cover is positioned over the terminal lugs, the actuating member and the lock nut. The stud extends through a hole in the cover. Raised bosses 37 on the insulating base cooperate with notches in the cover to aid in preventing the cover from turning. The cover is secured in position by a retaining nut 39 which may have a small hole 41 therein. A wire may be passed through holes 27 and 41 to prevent nut 39 from turning loose or for fastening a lead seal preventing unauthorized removal of the cover.

Although but one embodiment of the present invention has been illustrated and described, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

It is claimed and desired to secure by Letters Patent:

1. A switch including a base of insulating material, a pair of terminal lugs of conductive material on said base, an insulation member fixed to said base between said terminal lugs, a stud insulated from said terminal lugs and fixed to and extending from said insulation member, a conducting bridging member, an actuating member of insulating material in which said bridging member is partially embedded, said bridging member movable to a first position with portions of said bridging member making contact with recesses in said terminal lugs to provide a con-

ducting path from one of said lugs to the other of said lugs and said bridging member movable to a second position to disengage said portions from contact with said lugs and make contact with recesses in said insulation member, said actuating member provided with a bore, said stud extending through said bore and said actuating member rotatable about said stud to move said bridging member selectively into said positions, a cover of insulating material for said terminal lugs and actuating member, said cover having an opening therein through which said stud extends, and securing means mounted on said stud to selectively lock said actuating member and bridging member in said first and second positions and for retaining said cover in position.

2. A switch including a base of insulating material, a pair of conducting terminal lugs supported on said base, an insulation member fixed to said base between said terminal lugs, guiding means affixed to and extending from said insulation member, a conducting bridging member movable to a first position to make contact with said terminal lugs to provide a conducting path from one of said lugs to the other of said lugs and movable to a second position to disengage from contact with said lugs and to make contact with said fixed insulation member, an actuating member of insulating material in which said bridging member is partially embedded, said guide means rotatably guiding said actuating member to provide for selectively moving said bridging member into said positions, a cover of insulating material positioned by said guiding means for enclosing said terminal lugs and actuating member, and securing means mounted on said guiding means to selectively lock said actuating member and bridging member in said first and second positions and for retaining said cover in position.

3. A switch including a base of insulating material having a pair of spaced raised bosses and a raised block positioned approximately midway between said bosses; a pair of terminal lugs of conductive material on said base, one of said lugs positioned between one of said bosses and said block, the other of said lugs positioned between said block and the other of said bosses; a stud insulated from said lugs extending from said block and having a fixed position with relation to said block, said block and said lugs having four recesses which are equally spaced from said stud and from each other, said block having two of said recesses on opposite sides of said stud and each of said lugs having one of the other two of said recesses; a conducting bridging member; an actuating member of insulating material in which said bridging member is partially embedded, said actuating member provided with a bore extending therethrough; ears of said bridging member extending from said actuating member on opposite sides of said bore, said stud extending through said bore, said actuating member rotatable about said stud to move said bridging member to a first position with said ears in said recesses in said lugs to provide a conducting path from one of said lugs to the other of said lugs and to a second position with said ears in said recesses in said block to open said conducting path between said lugs; a cover for said lugs and said actuating member, said cover having notches engaging said bosses and having an opening through which said stud extends, said stud providing a common guide for said actuating member and for said cover, said stud having a hole

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in the upper end thereof; and securing means mounted on said stud retaining said actuating member and said bridging member in either of said positions and retaining said cover in position, said securing means including a seal external of said cover fastened through the hole in said stud.

4. A switch including a base of insulating material, a pair of conducting terminal lugs supported on said base, a raised block on said base between said terminal lugs, a stud insulated from said lugs extending from said block, said block and said lugs having four recesses which are equally spaced from said stud and from each other, said block having two of said recesses on opposite sides of said stud and each of said lugs having one of the other two of said recesses, a conducting bridging member, an actuating member of insulating material provided with a bore extending therethrough, said bridging member embedded in said actuating member with each of two opposite sides of said actuating member having an ear shaped portion of said bridging member extending therefrom, said stud extending through said bore, said actuating member rotatable about said stud to move said ears into selected ones of said recesses to a first position to provide a conducting path between said lugs and to a second position to insulate said lugs from each other, a cover for said lugs and said actuating member having an opening through which said stud extends, securing means mounted on said stud firmly retaining said actuating member and said cover, and a seal external of said cover, said stud providing a common guide and mounting means for said actuating member, said bridging member, said cover and said seal.

5. A switch including a base of insulating material having a pair of spaced raised bosses and a raised block positioned approximately midway between said bosses; a pair of terminal lugs of conductive material on said base, one of said lugs positioned between one of said bosses and said block, the other of said lugs positioned between said block and the other of said bosses; a stud insulated from said lugs extending from said block and having a fixed position with relation to said block, said block and said lugs jointly having four recesses which are equally spaced from said stud and from each other, said block having two of said recesses on opposite sides of said stud and each of said lugs having one of the other two of said recesses; a conducting bridging member; an actuating member of insulating material in which said bridging member is partially embedded, said actuating member provided with a bore extending therethrough, ears of said bridging member extending from said actuating member on opposite sides of said bore, said stud extending through said bore, said actuating member being rotatable about said stud to move said bridging member to a first position with said ears in said recesses in said lugs to

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provide a conducting path from one of said lugs to the other of said lugs and to a second position with said ears in said recesses in said block to open said conducting path between said lugs; a cover for said lugs and said actuating member, said cover having notches engaging said bosses and having an opening through which said stud extends, said stud providing a common guide for said actuating member and for said cover; and securing means mounted on said stud including a first nut firmly retaining said actuating member and said bridging member in either of said positions, and a second nut retaining said cover in position independently of the position of said actuating member and said bridging member.

6. A switch including a base of insulating material, a pair of conducting terminal lugs supported on said base, a raised block on said base between said terminal lugs, a stud insulated from said lugs extending from said block, said block and said lugs jointly having four recesses which are equally spaced from said stud and from each other, said block having two of said recesses on opposite sides of said stud and each of said lugs having one of the other two of said recesses, a conducting bridging member, an actuating member of insulating material provided with a bore extending therethrough, said bridging member embedded in said actuating member with each of two opposite sides of said actuating member having an ear shaped portion of said bridging member extending therefrom, said stud extending through said bore, said actuating member being rotatable about said stud to move said ears into selected ones of said recesses to a first position to provide a conducting path between said lugs and to a second position to insulate said lugs from each other, a cover for said lugs and said actuating member having an opening through which said stud extends, securing means for said cover and said actuating member including a nut mounted on said stud firmly retaining said actuating member in position, said stud providing a common guide and mounting means for said actuating member, said bridging member and said cover.

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