Oct. 30, 1928.

1,689,926

G. J. MEUER

ELECTRIC SWITCH

Filed June 15, 1923

Fig. 1.

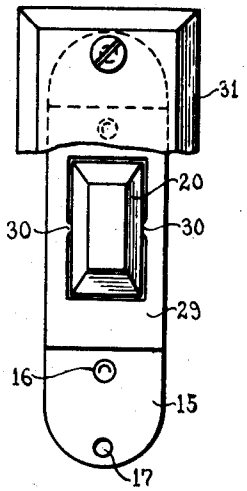


Fig. 2.

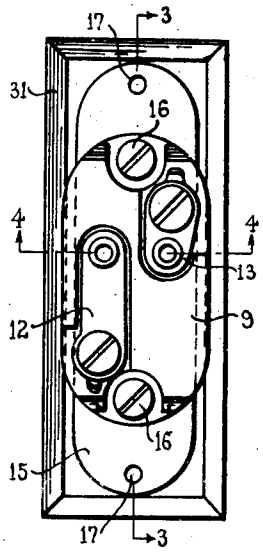


Fig. 3.

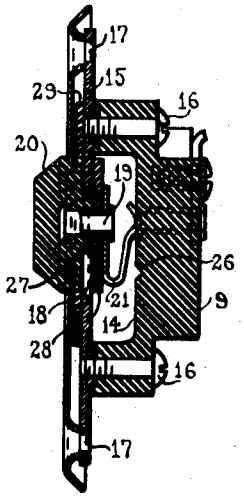


Fig. 4.

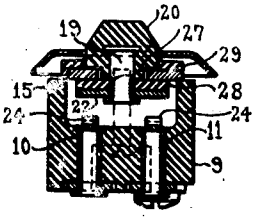
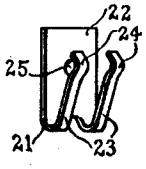


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH.

Application filed June 15, 1923. Serial No. 645,508.

This invention relates to electric switches and more particularly to switches adapted for flush or concealed mounting.

An object of the invention is that of providing a simplified and improved switch of the character specified.

Another object is that of providing such a switch having improved operating characteristics.

Another object is that of providing such a switch involving a minimum number of parts and whereof the space requirements are also minimized.

Another object is that of providing such a switch of increased ruggedness, durability and efficiency and at a minimum expenditure of labor and material.

Other objects and advantages will hereinafter appear.

In the accompanying drawing, wherein is illustrated a preferred embodiment of the invention Figures 1 and 2 are respectively front and rear views thereof; Fig. 3 is a longitudinal sectional view of the same, substantially on line 3—3 of Fig. 2; Fig. 4 is a transverse sectional view substantially on line 4—4 of Fig. 2; while Fig. 5 is a view illustrating more fully certain details of Figs. 3 and 4.

Referring to the drawings, the same illustrates a switch base 9 of insulating material, which in practice may comprise moulded composition material, carrying spaced fixed contacts 10 and 11 of the switch, together with externally located individual terminal devices 12 and 13 electrically connected thereto. Said base is provided with a recess having an internal surface 14, relative to which said contacts 10 and 11 are carried in substantially flush relation. Said recess is normally closed by a supporting plate 15, preferably of metal, secured to the base 9 as by means of screws 16, said plate 15 having additional openings 17 providing for conventional flush mounting of the complete device, and with a slot 18, which is preferably rectangular, to be penetrated and traversed by the switch operating member 19, carrying at its outer end an operating handle 20 and at its inner end a bridging contactor 21 to cooperate with the aforementioned fixed contacts.

In practice the base 9 is provided with adjacently and symmetrically located passages terminating in countersunk portions located within the aforedescribed recess and a corresponding number of elongated tubular rivets are arranged within said passages with their heads constituting the aforementioned fixed contacts 10 and 11, and located in the countersunk portions of the latter to afford the aforedescribed flush relation with the inner surface 14 of such recess. The terminal devices 12 and 13 are strung upon projecting portions of the respective rivets and the latter are then expanded for positive and permanent maintenance of the parts in assembled relation.

The bridging contactor 21 may preferably comprise an integral stamping of resilient conductive material, such for example as phosphor bronze. Structurally said contactor may preferably comprise a substantially flat body portion 22 and a number of reflexed projecting portions 23 equal to the number of the cooperating fixed contacts, each of said portions 23 being terminally provided with an exteriorly convex contact portion 24 of such dimensions as to take within the opening of its associated tubular contact when located adjacent thereto, the resiliency of the portion 23 serving to effect and maintain firm resilient engagement of such elements.

The operating handle 20 also may preferably comprise a molded body of insulating material shaped to project but slightly beyond the supporting plate 15 while nevertheless providing for easy and positive actuation of the switch. Said handle is provided with a projecting shank constituting the operating member 19 and which may preferably comprise a tubular or other insert moulded to and within the handle. Said shank or operating member 19 is adapted, as aforedescribed, to pass through the slot 18 of plate 15, and therebeyond to enter a central opening 25 in the base portion 22 of contactor 21, being expanded or riveted therebeyond for securing such parts in somewhat loosely assembled relation. The aforedescribed structure thus provides for sliding of the so-attached parts longitudinally of said slot 18 to thereby move the contactor into and out of engagement with the fixed contacts for respectively making and breaking circuit therethrough.

Here it is to be observed that by the foregoing construction and arrangement positive sliding or wiping contact is provided. Also the aforedescribed entry of the contactors 24 within the depressions of their respective fixed contacts provides not only for firm and positive retention of the switch in closed relation, but also by opposing a definite resist-

ance to a force tending to cause opening of the switch serves upon overpowering of such resistance to provide a modified snap break. A suitable slot or depression 26 in the surface 14 of base 9 similarly provides for positive holding of the switch contactor when in off position and further provides for similar snap action in making circuit.

Again it is to be observed that the sliding movement of the operating handle 20 may be readily effected by a simple push in one direction or the other, whereas the reduced forward projection and general shape of said handle are such as practically to prevent the same being grasped by the operator, thereby rendering it exceedingly difficult, if not actually impossible, for the will of the operator to defeat the aforedescribed snap action of the switch.

The supporting plate 15 is ordinarily constructed of metal and hence the contactor 21 and operating member 19 will ordinarily be insulated therefrom. Thus in practice the operating handle is preferably provided upon its face adjacent the plate 15 with a rectangular raised portion 27 of a height approximately the thickness of said plate, the width of said raised portion being such as to make a sliding fit with the sides of the slot 18, and the length of said raised portion being such as not to restrict the necessary travel of the contactor. Said raised portion 27 thus serves the double function of insulating the operating member 19 from the plate 15 and preventing turning of the handle 20 with reference to said plate.

Also an insulating spacer 28 comprising fibre, or the like, is strung upon the operating member 19 between the contactor 21 and the plate 15 for preventing electrical contact therebetween.

An additional member 29, preferably composed of fibre or other insulating material, is fitted firmly over and about the handle 20 and movable therewith to provide against uncovering a terminal portion of the slot 18, as upon movement of said handle toward the opposite end of said slot. In practice the member 29 is provided with an opening adapted to fit snugly about the periphery of the handle 20, whereas projecting tongues 30 may be provided to extend inwardly of said opening. Thus in assembling said member 29 about the handle 20 said tongues are adapted to undergo a certain degree of upward displacement, whereby upon subsequent application of a force tending to cause removal of said member 29 from said handle said tongues are adapted to become wedged against the adjacent portions of the handle for resisting such removal.

Also in practice a suitable face plate 31 is preferably provided, said face plate having an enlarged opening to fit about the handle 20 while permitting adequate movement of the latter and with reduced openings to register with the openings 17 of the supporting plate 15, thereby enabling mounting and securement of both said plates by means of common mounting screws or the like.

What I claim as new and desire to secure by Letters Patent is:—

1. In a unitary switch structure adapted for flush mounting, the combination with a recessed insulating member, of a plurality of eyelet contacts penetrating one wall of said member and riveted thereto, a metallic member to which said insulating member is secured for support thereby, a metallic face plate, a resilient contactor movable longitudinally of said insulating member to make and break circuit between said contacts, said contactor having means adapted for interlocking engagement with said eyelet contacts to resist separation from the latter, an operating handle of insulating material carrying said contactor and adapted to project outwardly beyond said face plate, and cooperating means on said face plate and said handle for limiting the latter to straight line movement in opposite directions.

2. In a unitary switch structure adapted for flush mounting, the combination with a metallic supporting plate having a slot therein, of a recessed insulating base to be secured to said plate, eyelet contacts penetrating one wall of said base and riveted thereto, an insulating switch handle having a conductive element thereof extending through said slot, and a reflexed resilient contactor secured directly to said element, said handle having common means for preventing electrical contact between said element and said plate and also for preventing relative rotation of said handle and said plate.

3. In a unitary switch structure adapted for flush mounting, the combination with a supporting plate having a slot therein, of a switch operating member extending through said slot and movable longitudinally thereof, a reflexed resilient contactor and an operating handle of insulating material each rigidly secured to said operating member upon opposite sides of said plate, said handle having flat surfaces parallel to the direction of movement of said member, means for insulating and spacing said contactor from said plate, a face plate superimposed upon said supporting plate and provided with an elongated slot to receive said handle and to permit rectilinear switch operating movement thereof, common means for securing said plates to each other and to a suitable support, and a flat member carried by and movable with said handle between said plates for closing portions of said slots when not closed by said handle.

4. In a switch for flush mounting, the combination with a supporting plate having a slot therein of a switch operating member extending through said slot and movable longitudi-

nally thereof, a contactor and an operating handle carried by said operating member upon opposite sides of said plate, said handle having flat surfaces parallel to the direction of movement of said member, means for insulating said contactor from said plate, a face plate carried by said supporting plate and provided with an elongated slot to receive said handle and to permit rectilinear switch operating movement thereof, and a flat member carried by and movable with said handle between said plates for closing portions of said slots when not closed by said handle, said flat member having projecting parts to grip the sides of said handle for resisting separation therefrom.

5. In a switch adapted for flush mounting, the combination with a metallic front plate having a slot and an insulating base having a surface parallel to the front plate, a pair of spaced circuit terminals comprising elements penetrating said base and having their respective ends upset or riveted and exposed on the forward face of said base, a switching member comprising a pair of insulating elements respectively engaging the forward and rear faces of said front plate, the forward insulating element having a shank extending into the slot in said front plate, said shank having flat sides engaging the longitudinal walls of the slot to prevent rotation of said forward insulating element with respect to said front plate, said shank being also engageable selectively with the end walls of said slot to limit the movement of said forward insulating element in opposite directions respectively, a metallic member penetrating the rear insulating element and engaging said forward insulating element to clamp said elements to each other, and a contactor carried by said metallic member to be engaged with said circuit terminals to bridge the latter.

6. In a switch adapted for flush mounting, the combination with a metallic front plate having a slot and an insulating base having a surface parallel to the front plate, a pair of spaced circuit terminals comprising elements penetrating said base and having their respective ends upset or riveted and exposed on the forward face of said base, a switching member comprising a pair of insulating elements respectively engaging the forward and rear faces of said front plate, the forward insulating element being of substantially frusto-pyramidal shape and having a shank extending into the slot in said front plate, said shank having flat sides engaging the longitudinal walls of the slot to prevent rotation of said forward insulating element with respect to said front plate, said shank being also engageable selectively with the end walls of said slot to limit the movement of said forward insulating element in opposite directions respectively, a metallic member penetrating the rear insulating element and engaging said forward insulating element to clamp said elements to each other, and bridging contactor for said terminals carried by said metallic member and having a spring bias whereby said contactor exerts pressure on said terminals when in engagement therewith.

In witness whereof, I have hereunto subscribed my name.

GEORGE J. MEUER.