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G. J. MEUER

ELECTRIC SWITCH

Filed Jan. 18, 1926

Fig. 1.

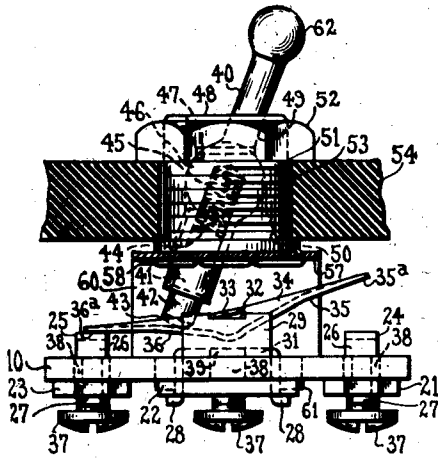


Fig. 2.

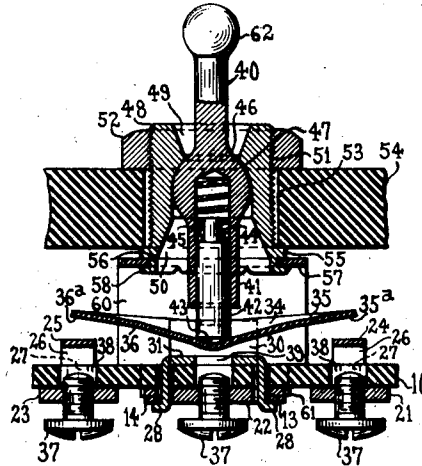


Fig. 3.

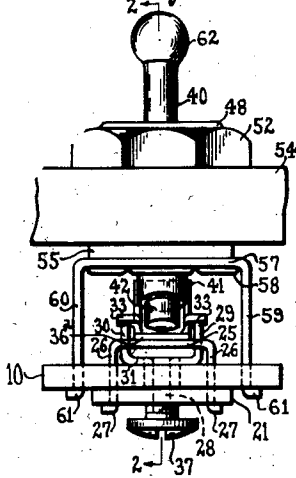
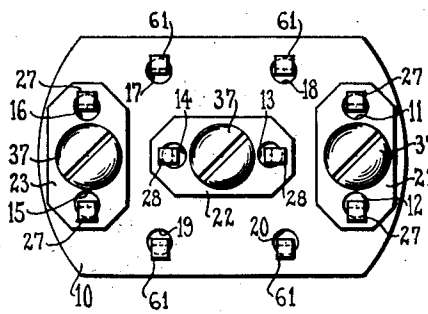


Fig. 4.



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ELECTRIC SWITCH.

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This invention relates to an electric switch, and more particularly to a switch adapted to selectively control a plurality of electric circuits.

5 An object of the invention is to provide a switch of the above character which is of simple and relatively inexpensive construction, the number of parts and the amount of material required in constructing the same
10 being reduced to a minimum.

Another object is to provide improved attaching means for the various elements of the device and for the device as a whole.

15 Another and more specific object is to provide a switch having a rocking contact element which may be positively moved to and held in opposite extreme positions for completing circuit or alternatively moved to and held in an intermediate position for circuit
20 breaking.

Other objects and advantages of the invention will hereinafter appear.

The accompanying drawing illustrates an embodiment of the invention which will
25 now be described, it being understood that the embodiment illustrated is susceptible of modification without departing from the spirit and scope of my invention as defined in the appended claims.

30 In the drawing,

Figure 1 is an enlarged side elevational view, partly in section, of a switch constructed in accordance with my invention, the operating lever being shown in one extreme position thereof;
35

Fig. 2 is a cross sectional view, on the line 2—2 of Fig. 3, showing the operating lever in its intermediate position;

40 Fig. 3 is an end view of the switch, with the parts in the positions illustrated in Fig. 1; and

Fig. 4 is a bottom plan view of the same.

Referring to the drawing, the numeral 10
45 designates a relatively thin base plate formed of insulating material, said base being provided with a plurality of relatively small perforations or openings 11 to 20, inclusive; openings 11 to 16, inclusive, being adapted to register with corresponding
50 openings in terminal plates 21, 22 and 23, respectively. Terminal plates 21 and 23 are secured to base 10 by means of substantially U-shaped metallic members the horizontal portions 24 and 25 of which are
55 adapted to form stationary contacts for the

switch. The parallel arms 26 of said members are provided with reduced portions 27 which pass through the aforementioned registering openings and are bent over, as best shown in Fig. 4, to thereby rigidly hold the
60 insulating base, terminal plates and stationary contacts together. It will be noted that the reduced portions 27 form shoulders upon the arms 26, whereby the stationary contact surfaces 24 and 25 are spaced a pre-
65 determined distance above the insulating base 10.

Terminal plate 22 is also adapted to be secured to base 10 by means of arms or
70 projections 28 which extend through openings 13 and 14 in the base and through the corresponding openings in terminal plate 22, the ends of said arms being bent over, as shown in Figs. 1, 2 and 4. As shown, the
75 arms 28 are integrally connected with a U-shaped metallic member having upwardly extending parallel side portions 29 and 30, and a flat bottom portion 31, the latter being adapted to rest upon the upper sur-
80 face of base 10. Each of the side portions 29 and 30 is provided with a straight cut-away portion 32 (Fig. 1) adapted to form bearings for the straight lateral fins or pro-
85 jections 33 of a trough-shaped metallic contact member 34, the latter having angularly disposed bottom surface portions 35 and 36 which converge at a point some distance below the fins or projections 33; the outer
90 ends 35^a and 36^a of said bottom portions being adapted to engage the respective stationary contacts 24 and 25 when member 34 is rocked or tilted, as hereinafter de-
scribed.

As shown, each of the terminal plates 21, 22 and 23 is provided with a tapped hole
95 adapted to receive a binding screw 37, whereby suitable circuit connections for the switch may be effected, suitable openings 38 being provided in the base 10 to accom-
100 modate the shanks of said screws, whereas bottom portion 31 of the intermediate metallic member is provided with an opening 39 for a like purpose. As aforeindicated the switch is adapted to selectively
105 control a plurality of electric circuits, the intermediate terminal plate 22 being connected with the common circuit wire. Thus when the contact member 34 is tilted or rocked to the left into engagement with sta-
tionary contact 25 (as shown in Fig. 1) one 110

of the circuits will be completed, whereas upon rocking the contact 34 to the right into engagement with stationary contact 24 the other circuit will be completed. Moreover, I have provided operating means whereby the aforescribed rocking movement of contact 34 into and out of engagement with the stationary contacts may be effected with a quick action, said means being also adapted to positively hold contact 34 in the intermediate position shown in Fig. 2, whereby both circuits are interrupted.

The aforementioned operating means preferably comprises a metallic lever 40 having a cavity or recess 41 in the lower end thereof adapted to receive a plunger 42 formed of insulating material. The outer end 43 of said plunger is preferably rounded, as shown, whereas the inner end thereof is provided with a reduced portion or shank 44 forming an annular shoulder to be engaged by a spring 45 which tends to force the plunger outwardly. Lever 40 is provided with an enlarged ball-shaped portion 46, which bears upwardly against a correspondingly shaped recess 47 in a bushing 48. Bushing 48 is provided with flared openings 49 and 50 at opposite ends thereof to permit oscillating or angular movement of the lever, and said bushing is also provided with an externally screw-threaded portion 51 adapted to cooperate with a clamping nut 52, the latter being suitably formed to facilitate tightening thereof by means of a wrench or the like.

In practice the bushing 48 is adapted to be fitted into an opening 53 of suitable size in a panel 54 or the like, whereby the threaded end thereof will project slightly beyond the outer surface of the panel, the inner end of the bushing being provided with an annular projection 55 for engagement with the inner surface of the panel. Said inner end of the bushing is also provided with a relatively thin walled annular extension which is adapted to enter a suitable opening 56 in the horizontal portion 57 of a U-shaped metallic member, said annular extension being thereafter spun over or peened, as indicated at 58, to secure said bushing and member together. Said member is also provided with downwardly extending parallel side portions 59 and 60 having lugs or extensions 61 adapted to take within the openings 17 to 20 in base 10, said lugs being thereafter bent as indicated to complete the assembling operation.

Lever 40 is preferably provided at the outer end thereof with a knob 62 to facilitate operation of the switch, said knob being sufficiently small in diameter to permit passage thereof through the bushing 48, for assembling the respective parts. Thus, with the various parts secured to the base 10 in the manner heretofore described, and with the projections 33 of contact member 34 resting

in the bearings 32, the lever may be positioned with its plunger 42 in engagement with the converging bottom surfaces 35 and 36, whereupon the bushing 48 with its attached U-shaped member may be slid over the knob 62 of the lever, and the U-shaped member then clamped to the base by means of the lugs or extensions 61. The switch parts are thus held in operative relation with respect to each other, whereas the switch as a whole may be attached to a suitable panel by means of clamping nut 52 in the manner aforescribed.

Obviously, when the plunger 42 is in engagement with surfaces 35 and 36 at the point of convergence thereof, beneath the pivot projections 33, as best illustrated in Fig. 2, the member 34 will be positively held in its intermediate position, whereby both circuits are interrupted. The stability of contact member 34 in its intermediate position is enhanced by the provision of the straight pivot projections 33 in conjunction with the straight bearing surfaces 32, as will be obvious. This arrangement likewise provides for movement of the switch contact 34 with a quick action into or out of its extreme or intermediate positions.

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

1. In an electric switch, the combination with an insulating base, of a plurality of stationary contacts carried thereby, a movable contact member supported intermediate said first mentioned contacts and having contact arms overhanging the latter, means for positively holding said movable contact in an intermediate position wherein all of said contacts are disengaged, said means comprising a pivoted lever adapted upon oscillation thereof to tilt said contact member to effect engagement of the latter with said stationary contacts selectively.

2. In an electric switch, the combination with an insulating base, of a plurality of stationary contacts carried thereby, a movable contact member pivotally supported intermediate said first mentioned contacts and having angularly arranged contact arms overhanging the latter, and means including a pivoted lever for positively holding said contact member in a position wherein said contact arms are out of engagement with the respective stationary contacts, said means being also adapted to effect movement of said contact arms into and out of engagement with said stationary contacts selectively with a quick action.

3. In an electric switch, the combination with an insulating base plate, of a plurality of contacts carried thereby, certain of said contacts being fixed and one of said contacts being pivoted intermediate said fixed contacts and movable selectively into and out of engagement with the latter, and a pivoted

operating lever having a spring pressed plunger adapted to engage said movable contact in a plane beneath the pivot point of the latter, said movable contact having angular surfaces adapted to cooperate with said plunger for insuring positive intermediate positioning of the former while providing for movement thereof into and out of engagement with said stationary contacts selectively with a quick action.

4. In an electric switch, the combination with an insulating base plate, of a plurality of contacts carried thereby, certain of said contacts being fixed and one of said contacts being pivoted intermediate said fixed contacts and movable selectively into and out of engagement therewith, a pivoted operating lever having a spring pressed plunger adapted to engage said movable contact in a plane beneath the pivot point of the latter, said movable contact having angular surfaces adapted to cooperate with said plunger for insuring movement of the former from an intermediate position into engagement with said stationary contacts selectively with a quick action, said plunger being adapted to positively hold said movable contact in its intermediate or extreme positions.

5. In an electric switch, the combination with a thin base plate of insulating material, said base plate having a plurality of openings therethrough, of a metallic terminal plate having openings to register with said first mentioned openings, one of said openings in said terminal plate being tapped to receive a binding screw, a contact member comprising a strip of metal having reduced end portions, said strip being bent at a plurality of points intermediate said reduced end portions to provide for passage of the latter through certain of said registering openings whereby the intermediate portion of said strip is spaced a predetermined distance from said base plate, and said end portions being thereafter bent to secure said base plate, contact member and terminal plate to each other.

6. In an electric switch, the combination with an insulating base, of a plurality of stationary contacts carried thereby, a contact pivoted intermediate said stationary contacts and having angularly arranged arms movable selectively into and out of engagement with the latter, said arms being adapted to converge below the pivot point of said contact, and an operating member comprising a lever having a ball and socket bearing, said lever having a recess in one end thereof and a spring pressed plunger adapted to project therefrom, said plunger being arranged to engage said movable contact for effecting quick movement of the latter into and out of engagement with said stationary contacts selectively upon movement of said lever in reverse directions.

7. In an electric switch, the combination with a thin base plate of insulating material, of a plurality of U-shaped stationary contacts having surfaces spaced from said base plate, a substantially V-shaped contact supported intermediate said stationary contacts, said contact having flat projecting portions adapted to cooperate with correspondingly shaped bearing surfaces to permit tilting movement thereof, an insulating plunger adapted to engage said V-shaped contact, a lever having a recess to receive said plunger, a spring in said recess adapted to force said plunger outwardly therefrom, a ball and socket bearing for said lever, and means for limiting said lever to oscillating movement in a given plane, said lever being movable to an intermediate position to effect disengagement of all of said contacts and being also movable to opposite extreme positions with a quick action to effect engagement of said V-shaped contact with said stationary contacts selectively.

8. In an electric switch, the combination with a thin flat base plate of insulating material, said base plate having a plurality of openings therethrough, of a metallic terminal plate having openings to register with certain of said first mentioned openings, one of said openings in said terminal plate being tapped to receive a binding screw, a contact member comprising a strip of metal having reduced end portions, said strip being bent at a plurality of points intermediate said reduced end portions to provide for passage of the latter through certain of said registering openings whereby the intermediate portion of said strip is spaced a predetermined distance from said base plate, said end portions of said strip being thereafter bent to secure said base plate, contact member and terminal plate to each other, a U-shaped metallic housing member having downwardly extending substantially parallel side portions, said side portions having lugs or extensions adapted to penetrate other of the openings in said base plate, and said lugs being thereafter bent to secure said member and said base plate to each other.

9. In an electric switch, the combination with a thin flat base plate of insulating material, said base plate having a plurality of openings therethrough, of a metallic terminal plate having openings to register with certain of said first mentioned openings, one of said openings in said terminal plate being tapped to receive a binding screw, a contact member comprising a strip of metal having reduced end portions, said strip being bent at a plurality of points intermediate said reduced end portions to provide for passage of the latter through certain of said registering openings whereby the intermediate portion of said strip is spaced a predetermined distance from said base plate,

said end portions of said strip being thereafter bent to secure said base plate, contact member and terminal plate to each other, a U-shaped metallic housing member having
5 downwardly extending substantially parallel side portions, said side portions having lugs or extensions adapted to penetrate other of the openings in said base plate,
10 said lugs being thereafter bent to secure said member and said base plate to each other, and means at the upper end of said metallic housing member to provide for attachment of the latter to a suitable support.

10. An electric switch comprising, in combination, a thin base plate of insulating material, said base plate having a plurality of openings therethrough, a metallic terminal plate having openings to register with certain of said first mentioned openings, one of
20 said openings in said terminal plate being tapped to receive a binding screw, a stationary contact member comprising a strip of metal having reduced end portions, said strip being bent at a plurality of points intermediate said reduced end portions to pro-

vide for passage of the latter through certain of said registering openings whereby the intermediate portion of said strip is spaced a predetermined distance from said base plate, said end portions of said strip being
30 thereafter bent to secure said base plate, contact member and terminal plate to each other, a movable contact also carried by said base plate, a U-shaped metallic housing member having an apertured top portion and
35 downwardly extending substantially parallel side portions, said side portions having lugs or extensions adapted to penetrate other of the openings in said base plate, said lugs being thereafter bent to secure said member
40 and said base plate to each other, an operating member for said movable contact extending through the aperture in said top portion, and means associated with said top portion
45 to provide for attachment of said housing member to a suitable support.

In witness whereof, I have hereunto subscribed my name.

GEORGE J. MEUER.