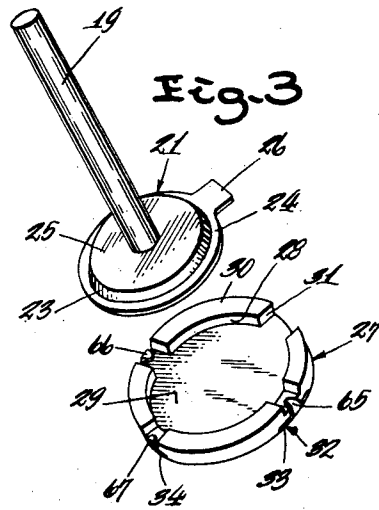
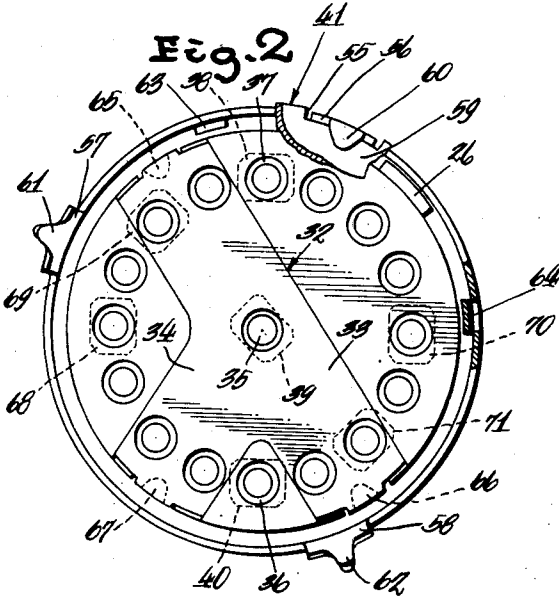
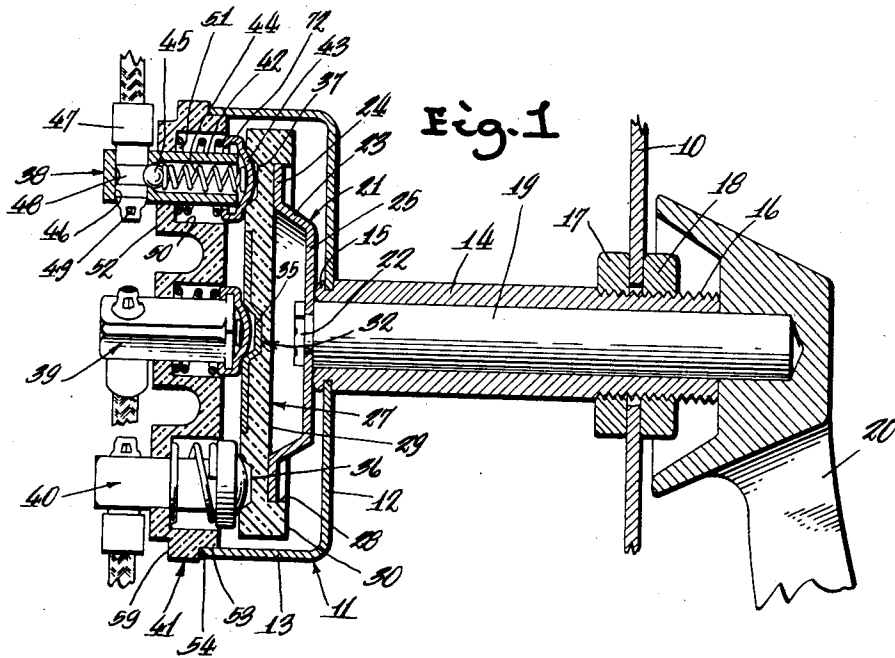


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ELECTRICAL CONTROL MEANS

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ELECTRICAL CONTROL MEANS

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4 Claims. (Cl. 200—11)

My invention relates to electrical control means, and more particularly to electric switches and the like, and the principal object of my invention is to provide a new and improved electrical control means of this type. In the drawing accompanying this specification, and forming a part of this application, I have shown, for purposes of illustration, one form which my invention may assume. In the drawing:

Figure 1 is a vertical sectional view of one form of my invention, as it may be embodied in an electrical switch, certain parts being shown in elevation,

Figure 2 is a rear view of the switch shown in Figure 1, the base thereof being substantially entirely broken away in order to show the parts within the switch casing, and

Figure 3 is a perspective detail view of an operating member and a contact carrying member, disassembled.

Referring to Figure 1 of the drawing, a panel 10 has mounted thereon and spaced therefrom a switch casing 11, of cup-shape, having a bottom 12 and a tubular portion 13 extending therefrom. Fastened to the bottom 12 is a threaded nipple 14, the threaded end 16 of which extends through an aperture in the panel 10. The nipple 14 may be fastened to the bottom 12 of the switch casing by providing it with a reduced end disposed through an aperture in the bottom and spinning the end 15 of the reduced portion over the inside of the bottom 12. Two nuts 17, 18 are provided, both of which are in engagement with the threaded nipple 14, the nut 17 being disposed at one side of the panel 10 and the nut 18 at the other side to thereby fasten the nipple 14 to the panel. A shaft 19 is disposed through the nipple 14 and is provided at one end with an operating handle 20. At the other end the shaft 19 is provided with a laterally extending operating member 21. The operating member 21 is dish-shaped, having a disc-shaped bottom 25 merging outwardly into a frusto-conical portion 23. The frusto-conical portion 23 is provided with a radially outwardly extending desirably circular flange 24. The shaft 19 has the end 22 thereof, which is joined to the operating member 21, reduced, the reduced end 22 being disposed through an aperture in the disc-shaped bottom portion 25, and being upset to fasten the shaft to the flange 25.

The radially outwardly extending flange 24 of the operating member 21 is here shown as provided with a projection 26 extending radially outwardly beyond the generally circular outline

of the flange 24. The projection 26 is adapted to serve as a part of the means whereby the operating member 21 may be drivingly connected to an insulating contact carrier 27.

The contact carrier 27 is shown as in the shape of a disc having a recess 28 of circular outline, the recess 28 having a bottom 29 in a plane at right angles to the axis of the contact carrier 27, and having a diameter such that the flange 24 of the operating member 21 will be readily received in the recess. The face of the flange 24 is adapted to be in engagement with the bottom 29 of the recess 28. The circular recess 28 forms an axially extending annular flange 30 on the contact carrier 27, and is here shown as provided with a radially extending slot 31 of sufficient width to freely receive the projection 26 on the operating member 21. The slot 31 extends axially to the plane of the bottom 29 of the recess 28.

The contact carrier 27 may be provided with any desired form of contact 32, here shown as comprising a diametrically extending portion 33, with which is merged a portion 34 extending from the diametrical portion 33 at less than right angles with the lower end of the diametrical portion 33, as viewed in Figure 2. The contact 32 is provided with a plurality of recesses, one of which, 35, is a central recess, visible in Figure 1, and the others of which, similar to the recess 35, are in the contact 32 at the radial outer ends of the portions 33, 34, as may be seen in Figure 2. The insulating contact carrier 27 is desirably also provided with a plurality of recesses, similar to the recess 35 in the contact member 32, two of which, 36, 37, are visible in Figure 1, the others being spaced at equal radii, about the center of the face of the carrier 27, as may be seen in Figure 2. The recesses in the contact member 32 and in the insulating carrier 27 are adapted to be engaged by a plurality of contact means, three of which, 38, 39, 40, are shown in Figure 1, the others being omitted for the sake of clearness. Other contact means 68, 69, 70, 71, including also the contact means 38, 39, 40, are indicated by dotted lines in Figure 2, from which the position of the contact means is apparent.

The contact means 38, 39, 40, 68, 69, 70, 71 are all identical, and are reciprocally mounted in a base 41. Accordingly, only one of the contact means, 38, will be described in detail. The contact means 38 comprises a body 42, desirably of oblong cross-section, as indicated in Figure 2, the corners being chamfered. The chamfers do not extend the entire length of the body 42,

but terminate near one end of the body, leaving projecting shoulders serving to retain an end closure 43 for the body 42. The end closure 43 has a dome-shaped portion serving as an electrical contact and may have an axially extending flange 72 spun over the projections on the body 42, as has been fully described in my co-pending application Serial Number 8,316, filed February 26, 1935. The body 42 has a bore containing a spring 44 bearing at one end against the inside of the closure 43 and at the other end against a ball 45 adapted to extend into a transverse aperture 46 in the body 42. A conductor terminal 47 is here shown as connected to the snap terminal formed by the ball 45 in conjunction with the aperture 46, the conductor terminal 47 being provided with a furrow 48 and a frustoconical end. The terminal 47 is swedged to the conductor as indicated by the swedge indentations 49. An aperture in a boss 52 on the base 41 through which the contact means 38 slidably passes is countersunk by a recess 50, in which is disposed a spring 51 bearing at one end against the spun over flange 72 on the contact 43, and at the other end against the bottom of the recess 50.

The base 41 has a reduced diameter at its inner face forming a reduced portion 53 adapted to be received within the tubular portion 13 of the casing. A shoulder 54, formed by the reduced portion 53, is adapted to abut the end of the tubular portion 13. The outer periphery of the base 41 is provided with a plurality of notches or recesses, desirably three, one of which, 55, is visible in the fragment of the base shown in Figure 2. The tubular portion 13 of the casing is provided with a plurality of axially extending projections 56, 57, 58 of a length substantially the same as the distance between the shoulder 54 on the base 41 and the outer face 59 of the base. The projections 56, 57, 58, three in number if there are three notches 55, are provided with fingers of generally triangular shape, narrower at their bases than the projections 56, 57, 58, two of which fingers, 61, 62, along with the projections 57, 58, are shown bent radially outwardly in Figure 2 to clearly show their form. The third finger 60 and the projection 56, which carries the finger 60, are shown in the position they occupy when the base 41 is fastened to the casing 11, the finger 60 being clinched over the outer face 59 of the base 41. The projections 56, 57, 58 are unequally spaced, and the notches 55 in the outer periphery of the base 41 are spaced to correspond to the unequal spacing of the projections 56, 57, 58. It will therefore be evident that for a predetermined position of contact means, such as 38, 39, 40 and so on, on the base 41, these contact means will assume a predetermined position with respect to the casing 11 when the base is assembled with the casing.

The casing 11 is provided with a pair of stops 63, 64, here shown as formed by striking inwardly a portion of the metal forming the tubular part 13 of the casing. The stops 63, 64 are adapted to be engaged by the respective radial edges of the projection 26 on the operating member 21.

The contact 32 may, if desired, be assembled with and mounted on the insulating carrier 27 by providing radial outer ends of the contact 32 with tongues 65, 66, 67, which may be clinched over the outer periphery of the insulating carrier 27 into radial slots formed in the axially ex-

tending flange 30, as may be seen clearly in Figure 3.

It will be obvious that the contact carrier 27 may be assembled in drivable relation with the operating member 21 by simply placing the contact carrying member 27 with the recess 28 in registry with the flange 24, and with the projection 26 in registry with the radial slot 31. The contact carrying member 27 is maintained in such assembled position and drivable relation with the operating member 21 simply by the fact that the contact means, such as 38, 39, 40, are biased toward and into engagement with the face of the contact carrier 27. The thrust produced by the contact means pressing the contact carrying member, and consequently the operating member, toward the right, as viewed in Figure 1, is taken by the spun over end 15 of the nipple 14, acting as thrust bearing.

It will be apparent that the position of the contact 32 about its axis, with respect to the operating member 21 and the projection 26 will be definitely predetermined by the location of the slot 31 in the contact carrying member 27, and that furthermore the position about its axis of the contact 32, with respect to the switch casing 11, when the projection 26 is in engagement with either the stop 63 or 64, or is in any intermediate position, is also definitely predetermined. Furthermore, inasmuch as the position of the relatively stationary contact means 38, 39, 40 and so on, about the axis of the casing 11, and with respect to the stops 63, 64, is definitely predetermined by the projections 56, 57, 58, in cooperation with the slots 55, therefore the relation between the contact 32 and the relatively stationary contact means 38, 39, 40, and so on, for a given position of the contact 32 about the axis of the casing, is also definitely predetermined.

Thus proper assembly of the parts is automatically assured and easily accomplished, so that the desired switching operations may be carried out when the handle 20 is placed in a predetermined position. It will of course be obvious that similar principles may be applied irrespective of the particular form of the contact 32 and the number and arrangement of the contact means carried by the base 41.

In view of the foregoing it will be obvious to those skilled in the art that my invention may be embodied in other constructions wherein the elements may assume a variety of forms, variously changed and modified within the spirit of the invention.

In general it will be clear to those skilled in the art that the features of my invention need not all be used in one embodiment, and may be individually or collectively variously changed and modified, without departing from the spirit of the invention, or sacrificing all of the advantages thereof, and accordingly that the disclosure herein is illustrative only, and that my invention is not limited thereto.

I claim:

1. In combination: contact means including relatively movable elements; one of said elements comprising a rotatably mounted operating member; a contact carrying member; means, including a projection on said operating member, for putting said operating member in driving relation with said contact carrying member; and a stop engageable by said projection.

2. In combination: contact means including relatively movable elements; one of said elements comprising a rotatably mounted operating mem-

ber; an electrical contact carrying member having a recess in a face thereof; means, including portions of said operating member and said contact carrying member, constructed and arranged 5 so that said contact carrying member may be mounted on and in drivable relation with said operating member by placing said contact member in predetermined position against said operating member with said operating member in 10 abutment with the bottom of said recess and in adjacent relation with the walls of said recess so that motion of said contact carrying member in its own plane is limited; and the other of said relatively movable elements including means for 15 maintaining said contact carrying member in said predetermined position.

3. In combination: a base; relatively stationary electrical contacts mounted on said base at predetermined places; a casing; means whereby 20 said base may be assembled with said casing in only one predetermined position; an operating member rotatably mounted in operative relation to said base; means including portions on said

casing and portions on said operating member for limiting rotation of said operating member between definite limiting positions with respect to the position of said relatively stationary contacts; and means whereby electrical contact means may 5 be mounted on said operating member in only one predetermined position about the axis of said operating member, for cooperation with said relatively stationary contacts.

4. In combination: a base; relatively stationary 10 electrical contacts mounted on said base at predetermined places; a casing; means whereby said base may be assembled with said casing in only one predetermined position; a contact carrying member; an operating member rotatably 15 mounted in operative relation to said base, and including projection means for putting said operating member in driving relation with said contact carrying member; and abutment means on 20 said casing, engageable by said projection means to limit rotation of said operating member.

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