This invention relates to electrical push button switches and more particularly to the provision of indica for the rectilinearly movable operators of such switches.

It is desirable, especially in cases where a plurality of push button switches are arranged in a group, to provide indicating means on the forwardly exposed faces of the switch operators for indicating the functions of the respective switches or the types of equipment with which they are respectively associated. For certain classes of service, it is not only desirable that the indicating means permit quick and ready distinction between the several operators of a group of switches, but also that the indicating means be readily alterable in accordance with changes in the equipment controlled by the switches or changes in the functions of the switches.

In the past, push button switches, such as shown in Mekelburg Patent No. 2,631,203, issued March 10, 1953, were often provided with different colored operators for easy identification. Those operators, however, could not be interchanged with others of different colors without disassembly of the switch, and, in some instances, were so secured in place that removal and replacement of the entire switch mechanism was necessary when an operator of a different color was required. When, on occasion, such a push button switch having an operator of an incorrect color was inadvertently installed in a control panel, time-consuming removal of the entire switch and replacement by one with an operator of the proper color was required. With such prior push button switches, it was necessary also for sales outlets to have on hand a multiplicity of switches with an assortment of different colored operators for efficient servicing of customers.

It is, therefore, desirable to provide a push button switch in which the switch mechanism need not be disassembled or removed and replaced when it is desired to change the color or other indication of classification associated with the operator. In accordance with this invention, a means for push button switch identification is provided which is easily changeable from one push button switch to another without the switch mechanism being removed or mounted in position and operable, and without the necessity of dismantling or completely replacing the switch.

A principal object of this invention is to provide a push button switch having an operator arranged in an improved manner to receive different distinguishing indicia selectively for providing positive identification which will continue even under heavy usage.

A further object is to provide an improved switch operator arranged to receive an indicating insert which may be readily snapped into place in the operator and removed therefrom, selectively, but which remains securely in place unless deliberately removed.

Another object is to provide an improved operator for a push button switch having an indicating insert provided with a centrally disposed extending portion removably received in a recess centrally disposed in the front face of the operator.

Another object is to provide an improved indicating insert arranged to be removably mounted on the operator of a push button switch.

Other objects and advantages of the invention will be apparent from the following description, wherein reference is made to the drawings, in which:

FIG. 1 is a front elevation of a push button switch embodying the present invention;

FIG. 2 is a partial sectional view on the line 2—2 of FIG. 1;

FIG. 3 is an enlarged view, partially in diametrical section, of an indicating insert according to the present invention; and

FIG. 4 is an enlarged fragmentary sectional view on the line 4—4 of FIG. 1 showing the insert in position in the operator.

A push button switch operator in accordance with this invention has a generally concave forward face with a deeper concavity or recess in the center thereof. The peripheral wall of the recess has portions overhanging the recess in forwardly spaced relation thereto. A relatively stiff resilient plate member proportioned to overlie said forward face has a rearwardly directed projection including resilient peripheral fastening portions arranged to lie radially outwardly from the inner peripheral limits of the overhanging wall portions when the projection is received in the recess, thus to hold the plate member snugly against the forward face of the operator. The projection and the inner peripheries of the overhanging wall portions cooperate as the plate member is pressed flatwise toward said forward face with said projection entering into said recess to displace said peripheral fastening portions of said projection radially inwardly of said overhanging wall portions toward the midportion of said projection to allow the projection to enter the recess.

Referring first to FIG. 1 and 2, there is shown an electrical push button switch 10 having a rectilinearly movable operator 11 preferably made of metal and provided with an indicium or identification means in accordance with this invention. The switch 10 is adapted to be mounted on a panel 12, and it will be understood that movement of the operator 11 downwardly in FIG. 2 against the bias of a spring 13 causes a disc 14 to engage a plunger 15 of an enclosed switch mechanism 16. Upon release of the operator 11, the spring 13 returns it to its initial position and pressure of the disc 14 on the plunger 15 ceases.

Referring now to FIGS. 2, 3, and 4, the operator 11 has a concave forward face 21. Centered in the face 21 and opening rearwardly therefrom is a further concavity or recess 22 having a generally cylindrical neck portion 24 opening into a generally spherical main portion 25 rearward of the neck portion. The peripheral wall of the neck portion 24 slopes gradually into the face 21 as at 26 and into the spherical portion 25 as at 28. The neck portion 24 and the spherical portion 25 of the recess 22 thus define an annular wall portion 29 overhanging the spherical portion 25. The recess 22 is adapted to receive a complementary projection 30 integral with and extending from the rearward face of a relatively stiff resilient insert 31 having a body shaped generally like a flat plate and preferably made of a resilient plastic material of selected color or bearing indicia on its forward face of some form. As shown, the insert has a plurality of concentric rings in its forward face.

As best shown in FIG. 2, the projection 30 has a relatively narrow cylindrical neck portion 32 and a generally spherical fastening portion 34. The neck portion 32 curves gradually into the rearward face of the insert 31 and into the main portion 34 as indicated at 35 and 36, respectively. The projection 30 is sized with respect to the recess 22 so that the fastening portion 34 fits snugly into the spherical portion 25 of the recess 22 and the neck portion 32 of the projection 30 fits snugly into the neck portion 24 of the recess 22. The center of the spherical portion 25 of the concavity 22 is so spaced from the face 21 of the operator 11 in relation to the distance from the center of the fastening portion 34 of the projection 30 to the rearward face of the insert 31 that when the insert 31 and operator 11 are assembled, the insert 31 is —
formed from its normal flat shape as shown in FIG. 3 to fit tightly on the concave face 21 as shown in FIG. 4.

The insert 31 is installed in the operator 11 by first aligning it flatwise with the face 21 and applying pressure at the center of its forward face. Because of the neck portion 24 of the recess 22, the spherical fastening portion 34 of the insert 31 is deformed inwardly to permit its entry into the spherical main portion 25 of the concavity 22. During installation, the inner periphery of the overhanging wall 29 engages the fastening portion 34 of the projection 30 and continued pressure applied at the center of the insert 31 on its forward face causes the fastening portion 34 to be deformed inwardly, thus permitting entry of the portion 34 of the projection 30 into the concavity 22. When the projection 30 is fully received in the recess 22, the wall portion 29 tightly engages the forward face of the fastening portion 34 to hold the rearward face of the insert 31 against the face 21 of the operator 11. The wall portion 29 thus provides an overhanging metallic border extending completely around the projection 30 of the insert 31 so that the fastening portion 34 lies generally beneath and outwardly from the inner peripheral limits of the wall portion 29.

In practice, the insert 31 is preferably molded of a colored polyethylene material, which color does not fade or change even under heavy usage, and may of course, be available in several different colors. If desired, some or all of the concentric rings may be omitted and a numeral or letter molded in their place.

Although the overhanging wall portion 29 and the fastening portion 34 have been shown and described as continuous, it is to be understood that they could be interrupted to define a series of cooperating overhanging wall portions and fastening portions.

The invention thus provides an electrical push button switch with an insert 31, preferably of a selected color, which is easily replaceable in the switch operator without requiring disassembly or replacement of the switch to effect a color change. Although a change in the insert 31 may be made with equal ease either before or after the switch is installed on a panel, the method of engagement of the insert 31 within the operator 11 is so secure that accidental loosening due to vibration or abuse is prevented. Once installed, the insert 31 may be removed only by prying it out with a suitable tool, thus effectively discouraging promiscuous changing of inserts by unauthorized personnel.

While certain preferred embodiments of the invention have been specifically disclosed, it is understood that the invention is not limited thereto, as many variations will be readily apparent to those skilled in the art and the invention is to be given its broadest possible interpretation within the terms of the following claims.

1. A push button switch operator having a body with a forward face and a recess therein disposed centrally of the peripheral edges of said face, said recess having a peripheral wall with portions thereof overhanging the recess in forwardly spaced relation thereto, a plate member proportioned to overlie said forward face, said plate member being formed of resilient compressible material and having an integral centrally disposed, rearwardly directed projection, said projection having peripheral fastening portions arranged to lie outwardly from the inner peripheral limits of said overhanging wall portions when said projection is received in said recess, and inter-engageable means on said projection and the inner peripheries of said overhanging wall portions operable as the plate member is pressed flatwise toward said forward face with said projection entering into said concavity to compress said projection thereby to displace said peripheral fastening portions of said projection inwardly of said overhanging wall portions toward the mid-perection of said projection.

2. An apparatus according to claim 1 wherein said recess is generally spherical and said overhanging wall portions of said peripheral wall of said recess define a neck portion of said recess wherein said projection is generally spherical and complementary to said recess, and wherein said inter-engageable means on said projection includes portions of the forwardly directed surface of said projection.

3. An apparatus according to claim 1 characterized in that said recess is generally spherical in shape with a forwardly opening narrowed neck portion, and said projection is complementary to said recess and has a generally spherical portion receivable therein through said neck portion by inward displacement thereof.

4. An apparatus according to claim 1 characterized in that said forward face is concave, said plate member is normally flat, and said overhanging wall portions and said fastening portions are positioned to cause said plate to lie snugly against said forward face when said projection is received in said recess.

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