

Feb. 19, 1924.

1,483,873

W. H. DEY

LUMINOUS DEVICE

Filed Oct. 20, 1921

Fig. 1,

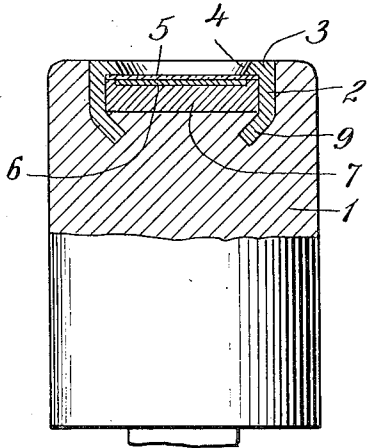


Fig. 2,

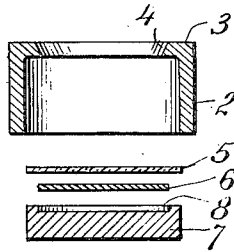


Fig. 3,

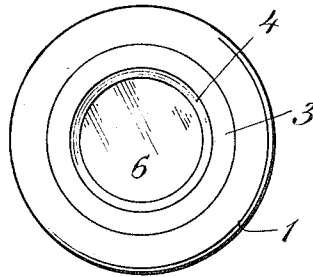


Fig. 4,

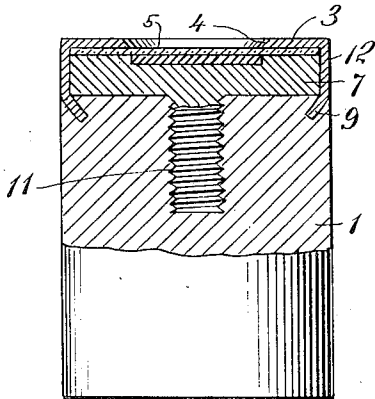


Fig. 5,

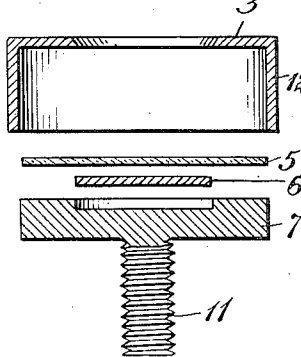


Fig. 6,

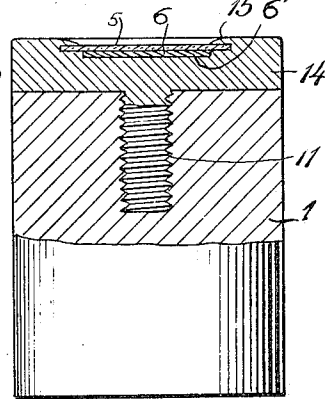


Fig. 8,

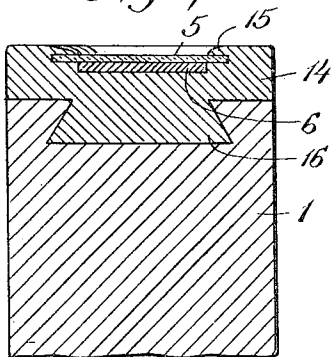


Fig. 9,

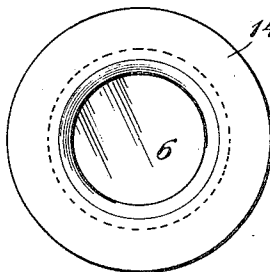
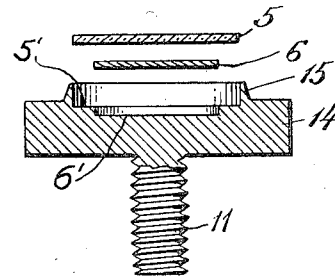


Fig. 7,



INVENTOR

BY William H. Dey

Pennie, Davis, Martin & Edmonds,
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM H. DEY, OF NEWARK, NEW JERSEY, ASSIGNOR TO UNITED STATES RADIUM CORPORATION, A CORPORATION OF DELAWARE.

LUMINOUS DEVICE.

Application filed October 20, 1921. Serial No. 508,971.

To all whom it may concern:

Be it known that I, WILLIAM H. DEY, a citizen of the United States, residing at Newark, in the county of Essex, State of New Jersey, have invented certain new and useful Improvements in Luminous Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to the self-luminous manually operated elements associated with electric switches so that they may be readily located in the dark and more particularly to the mounting of the luminous inserts in the handles of the switches. The invention is applicable to push buttons, bell pushes, flip, tumbler, snap, toggle and knife switches.

This application is particularly directed to that use of the invention in which the luminous insert is mounted in the push button of a push button wall switch, and accordingly the preferred embodiments thereof for that use will be described in detail. It should, of course, be understood that the invention is not limited to the exact details of construction that will be described nor to any particular type of switch.

The body of a push button is usually made of bakelite or other plastic material, such as finely divided carbon mixed with a binder, as shellac, molded into the desired shape, under heat and pressure. The luminous insert for such a push button is a small metal device carrying radioactive material and a protective disc of transparent material, usually celluloid, for the radio-active substance. It has been customary to mold such an insert into the plastic block under the influence of heat and pressure so that it will be firmly embedded therein. With such a process, however, a number of difficulties are met with; the heat used in molding discolors the celluloid; it oxidizes the adhesive material used as a binder in the radio-active material; the heat and pressure cause the celluloid to buckle; and small particles of material, which are often left in the mold from one molding become embedded in the celluloid of the next button that is molded, thereby spotting it and spoiling the appearance of the finished product.

The push buttons made in accordance with

this invention are designed to avoid all of the above mentioned disadvantages. Such buttons comprise several novel and distinctive features chief among which is a heavy recessed disc, preferably of metal, which is made so heavy and thick that it will not buckle under any conditions of molding or use. Luminous material is carried in the recess of the disc in any desired form, such, for instance, as a paper disc coated with luminous paint, as a powder or as a film of luminous paint painted on the inside of the recess. The luminous material is protected by a disc of transparent material such as celluloid or mica; celluloid is preferred and that material is specified in the following description. Moreover, the luminous material and its celluloid cover are held in place by a bezel element, the flange of which is of substantial thickness, whereby the luminous substance and the celluloid will be spaced during the molding operation from the bottom of the mold a distance equal to the thickness of such flange. This is particularly important because this space separates the celluloid and the luminous material from the hot walls of the mold, thereby preventing discoloring and buckling of the celluloid, preventing contact of the celluloid with the mold, and preventing oxidation of the binder used in the radio-active paint. The whole insert with its anchoring device may be readily molded in the plastic block so as to produce a clean button and one in which the celluloid is not discolored or buckled or spotted with dust particles and one in which the luminous material has not been detrimentally affected by the heat used in the molding.

The insert for the button may be assembled from the back. This is of advantage because the flange of the bezel, which is at the front and therefore must present a neat and pleasing appearance, may be accurately and cleanly finished before the parts are assembled. No work on the flange is necessary after the molding operation.

The essential features of the invention may be embodied in several different forms of buttons. In one form, the radio-active material is in the recessed disc and is covered by a protective disc of celluloid. A bezel element surrounds these parts and holds them in position. The parts are assembled from the back, the sides of the bezel being

straight to allow this; after assembling, the sides of the bezel are bent inwardly for locking the several discs in position and for forming an anchorage which is molded into the carbon body of the button. The flange of the bezel is of substantial thickness for the reasons already set forth.

In another form, the heavy metallic disc, provided with the usual recess, carries suitable anchoring means for engagement with the carbon block. A bezel may be used as before, for holding the discs together and for acting as a supplementary anchoring means.

In still another form, the metal disc, recessed as usual for the luminous material, is provided with integral flanges for holding the celluloid disc and luminous material in the recess in the metal disc, giving a structure in which a separate bezel may be omitted. In this form the metal disc is provided with a suitable anchoring device.

The invention is illustrated in the accompanying drawings in several preferred forms, but it should be understood that structural details may be modified within the scope of the invention, and that it may be carried out in other embodiments.

Preferred forms of the invention are illustrated in more detail in the accompanying drawings in which Fig. 1 is a view partly in section through a push button; Fig. 2 is a disassembled view of the insert; Fig. 3 is a plan view of Fig. 1; Fig. 4 is a view similar to Fig. 1 of a modification; Fig. 5 is a disassembled view of the insert of Fig. 4; Fig. 6 is a view similar to Fig. 1 of another modification; Fig. 7 is a disassembled view of the insert of Fig. 6; Fig. 8 is a section view through another modification; and Fig. 9 is a plan view of Fig. 8.

Referring now to the drawings in which similar reference characters indicate similar parts, 1 is the body portion of the button, preferably made of powdered carbon and a suitable binding material, which is plastic when subjected to heat and pressure. The insert for this button shown in detail in Fig. 2 comprises the bezel ring 2 provided with an inturned flange 3 of substantial thickness and which may be beveled as indicated at 4. The base or stiffening element of the insert is the metallic disc 7 made of substantial thickness so that it will not buckle or bend out of shape; this disc is provided with a shallow recess 8, for carrying a self-luminous element, here shown as a disc 6 coated with radio-active paint. It should, of course, be understood that the luminous material may be painted on the inside of the recess, or that it could be in powder form. The radio-active substance is protected from outside influences by the disc 5 of celluloid or similar material. The button is assembled from the back by put-

ting the several parts together in the order shown in Fig. 2, so that the luminous device 6 is in the recess 8, while the celluloid disc 5 protects it. After the several mentioned parts are assembled the lower edge of the bezel is spun inwardly to hold them in place. The insert thus assembled is mounted in the body 1 of the button by molding, the inwardly turned edge of the bezel, indicated at 9, Fig. 1, serving to anchor the insert.

The button shown in Fig. 4 is quite similar to that shown in Fig. 1, the main difference being that the metal disc 7 is provided with an anchoring post 11 of any suitable shape which, when the plastic carbon is molded around it, serves to hold the insert in position. In this form of the invention, the bezel ring indicated at 12 is made of a somewhat greater diameter than the corresponding ring shown in Fig. 1, as is apparent from the figure.

In Fig. 6 the recessed metal disc 14 is provided with a small recess 6' for the luminous material 6 and a larger recess 5' for the protective cover 5. Disc 14 carries a threaded anchorage 11 and an integral flange 15 which in Fig. 7 is shown in a vertical position. After the discs 5 and 6 are in place in their respective recesses, the flange 15 is spun down to the position shown in Fig. 6, so as to hold the discs in place. With this form of the invention no bezel ring is necessary. As is apparent from the drawing, the disc 14 is the full diameter of the body portion of the button.

The modification shown in Fig. 8 is similar to that shown in Fig. 6, a dove-tailed anchorage 16, however, being used in this form. For economizing in radio-active material, the size of the luminous disc or of the spot of luminous material on the disc, should be no larger than the opening in the end of the button.

The principal advantages of the invention may be briefly enumerated: the flanges 3 or 15, as the case may be, are of sufficient thickness to space the celluloid and radio-active material inwardly so that both are protected from heat during molding, whereby they will not discolor or buckle. Moreover, the celluloid is protected from contacting with dust particles during molding and, to a certain extent, is protected from undue wear when in use. The mounting of the luminous disc in a heavy metallic disc positions it accurately and protects it. The rigidity of the disc itself gives a stiff and sturdy insert that will not bend or buckle and which may be molded in place and mechanically inserted without fear of distortion. From an assembling point of view, the parts may be put together from the back and then locked together by bending in the flange, as in Fig. 1. This gives an insert for a button which is itself a complete entity

and may be handled as such; that is to say, it may be completely assembled in one department, one primarily equipped for that purpose, and then it may be molded in the body portion in a second department primarily equipped for this latter purpose. Furthermore, the outer flange may be finished on the lathe, before the assembling operation is begun, and may be given its final finish then and there. In the form shown in Figs. 6 and 8, no separate bezel element is necessary, inasmuch as the retaining flange is integral with the metal disc. This form is assembled from the front. And lastly, the anchoring devices shown, firmly and effectively hold the insert in place in the body portion of the button.

While the inserts have been described as being mounted in the button by molding, it should be understood that they may be mechanically inserted, especially the forms shown with the threaded backs; if this is the case, they may be readily renewed as desired.

I claim:

1. A unitary luminous insert for the button or handle of a switch, comprising a disc provided with a recess, a luminous element disposed in the recess, a protective cover for the luminous element and bezel means enclosing the disc and having a flange to overlie said cover and terminating at its opposite end in clamping means having a

portion bearing against the face of the disc and another portion projecting beyond this face and forming an anchorage for the insert.

2. A unitary luminous insert for the button or handle of a switch, comprising a disc provided with a recess, a luminous element disposed in the recess, a protective cover for the element, and bezel means enclosing the disc and having a flange to overlie said cover, said bezel means terminating at its opposite end in an inturned marginal flange having its free edge spaced from the face of the disc.

3. A button or handle for a switch, comprising a body portion and a luminous insert molded in the body portion, the insert comprising a recessed metallic disc, a luminous element in the recess of the disc, a cover for said element and bezel means for holding the disc and cover together, part of the bezel means being formed as an anchorage for embedding in the body portion.

4. A unitary luminous insert for the button or handle of a switch comprising a recessed disc, a luminous element in the recess of the disc, a protective cover therefor, bezel means for holding the mentioned parts in position, said bezel means terminating at its rear end in an anchoring means projecting beyond the face of the disc.

In testimony whereof I affix my signature.

WILLIAM H. DEY.