

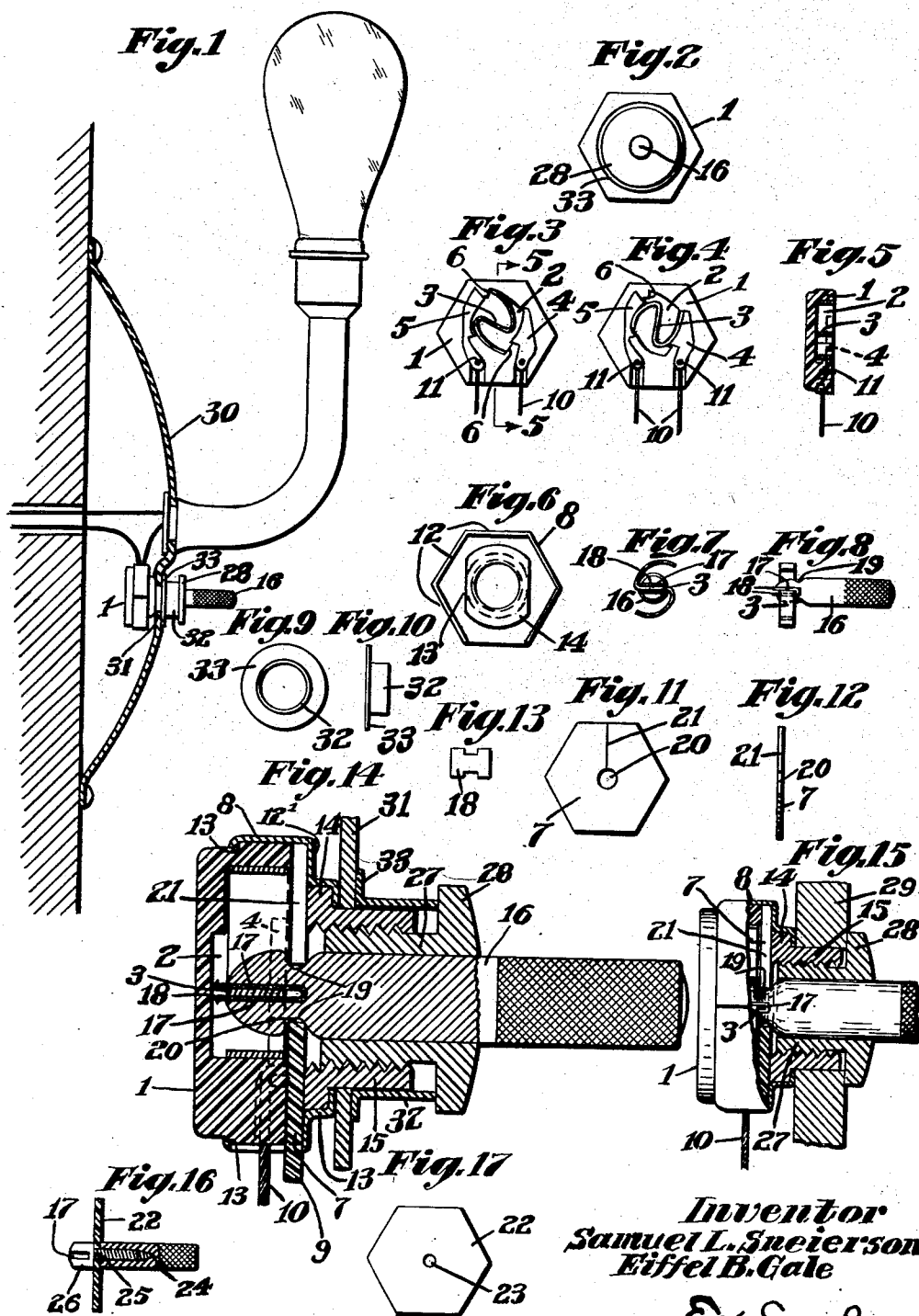
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CANOPY SWITCH

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UNITED STATES PATENT OFFICE

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CANOPY SWITCH

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This invention relates generally to electric switches of the rotary type and is particularly adapted for use in canopies or other places where the switch is mounted on a support with the switch body on one side concealed from view, while the rotary actuating member extends outwardly to the opposite side.

One of the objects of this invention is to provide a neat compact switch structure which may be readily assembled and mounted on a support, such for example, as a canopy or the like, without the necessity for use of independent securing means and external exposed threaded members.

A further object of the invention is to provide an improved switch structure which may be readily mounted on panels or canopies of varying thicknesses.

In the switch structures hereinbefore employed, where the switch is mounted on a canopy or panel so that the body of the switch is on one side of the panel support, and the switch is provided with an externally threaded portion which extends through an opening in the panel, the width of the panel on which the switch may be mounted has been limited to a width somewhat less than the length of the projecting externally threaded portion.

A further object of the present invention is to provide a switch construction and a mounting therefore which will enable the switch to be securely mounted on panels varying in thickness over a wider range than heretofore has been possible, and including a panel thickness greater than the length of the portion extending through an opening in the panel from the side opposite to that from which the switch is actuated.

A further object of the invention is to provide in a switch construction of the rotary type, an improved means for mounting the switch on panels of varying thickness, in which a single member serves the dual function of securing the switch in position, and also serves as an adjustable guide or sleeve which may be moved longitudinally of the actuating member and functions as a guide therefore.

A further object of the invention is to pro-

vide a switch construction including an internally threaded sleeve having a shoulder at one end thereof and an externally threaded sleeve having a shoulder at one end thereof, the latter sleeve being adapted to be threaded into the former, the parts being independent of the switch casing, but so disposed and arranged that a portion of the switch casing and a panel may be secured between the shoulders on the internally and externally threaded sleeves.

Other objects and advantages will be apparent from the drawing and the following description.

One preferred embodiment of the invention is shown in the drawing and hereinafter described for the purposes of illustration.

In the drawing:

Fig. 1 is an elevation showing a canopy or panel in section showing the application of the switch to a relatively thin canopy for a lighting fixture.

Fig. 2 is a top plan of the assembled switch.

Fig. 3 is a top plan of the body of the switch with other parts removed showing the contacts and with the spring switch in off position.

Fig. 4 is a view similar to Fig. 3, but showing the spring contact in closed position to establish a circuit.

Fig. 5 is a section taken on the line 5-5 and looking in the direction of the arrow of Fig. 3.

Fig. 6 is a bottom plan showing the switch casing with the internally threaded sleeve having the projecting shoulder thereon and so arranged as to prevent relative rotary movement between the switch casing and the internally threaded sleeve.

Fig. 7 is an elevation showing the rotary actuating member with the spring contactor in one end thereof and insulated therefrom.

Fig. 8 is a side view elevation of Fig. 7.

Fig. 9 is an elevation of a spacing bushing.

Fig. 10 is a side elevation of Fig. 9.

Fig. 11 is an elevation of a split insulator washer adapted to be mounted on the rotary actuated member.

Fig. 12 is a side elevation of Fig. 11.

Fig. 13 is a plan of the insulating strip shown in flattened position which insulating strip when in use is folded and positioned in the slot at the end of the rotary actuating member.

Fig. 14 is a vertical section of the switch structure showing the relative position of the parts in assembled relation and showing the switch mounted on a relatively thin panel.

Fig. 15 is a view of the switch partly in section showing the switch mounted on a panel of a thickness greater than the portion of the sleeve projecting from the switch casing and extending through the opening in the panel.

Fig. 16 is a section view showing a modified form of the rotary actuating member, and of the manner in which the insulating washer may be secured thereto.

Fig. 17 is a side elevation of Fig. 16.

In the drawing showing a preferred embodiment of the invention, the switch is shown as comprising a body 1 of insulating material, having a recess 2 therein adapted to receive a spring contact 3 adapted to be rotated to complete and interrupt a circuit between contact terminals 4—5 which are housed in the body 1. (See Figs. 3, 4, and 5).

Various forms and arrangements of movable spring contacts and terminal contacts may be used. In the preferred form shown, the spring contact is shown as a flat strip of metal bent to assume a generally inverted S form, and the contact terminals 4—5 are retained in place by being positioned in a recess in the body corresponding in shape to the shape of the respective terminal contacts, so that when the spring contact and terminal contacts are in circuit completing position, such as indicated in Fig. 4, a portion of the respective terminal contacts 4—5 contact with or engage the sides of opposite end portions of the spring contact 3. Preferably, the recess 2 in the body is provided with notches or shoulders 6 to retain the spring switch 3 in open circuit position and to prevent rotation thereof in reverse direction. Preferably, the arrangement of the parts is such that when the spring contact 3 and terminal contacts 4—5 are in proper relative position in the body 1, there are no parts projecting from the switch body 1 in order to permit the flat insulating member or disc 7, preferably corresponding in form to the contour of the body 1, to be placed over the body of the casing in order to retain the spring contact and terminals in proper position in the switch body and in order to insulate the contacts from the switch casing 8. Preferably, the insulating disc 7 extends beyond the switch body and casing as indicated at 9 in Fig. 14 above the point at which the conductors 10 enter the

switch casing to be connected with the contact terminals 4—5 in any suitable manner. In the form shown, the contact terminals 4—5 are provided with apertures 11 through which the end of the conductor 10 may be passed or twisted and if desired, soldered in position. The projecting portion 9 of the insulating disc 7 serves to insulate the conductors 10 from coming in contact with the metal casing 8 of the switch. The casing or cover 8 is preferably formed of sheet metal that may be readily formed as a stamp in a punch and die operation. The casing includes the top 11 and side portions 12 which fit over or telescope the body 1 which body is preferably provided with a reduced portion forming a shoulder 13 over which the end of the side 12 may be bent in order to retain the casing in proper position relative to the body.

It is understood however that other suitable means may be provided for retaining the casing in proper position relative to the body.

Preferably, the side of the casing adjacent to the point at which the conductors 10 lead into the switch body is omitted in order to permit the portion 9 of the insulating disc 7 to project from the switch body and casing.

The top of the casing is formed with a recess 13 of non-circular form in order to receive a projecting shoulder 14 formed on an internally threaded sleeve 15, the shoulder corresponding in form to the non-circular recess in the casing in order to prevent relative rotation between the casing and the sleeve 15. The sleeve 15 is preferably formed independent of the casing, and various other means well known in the art may be employed to prevent relative rotation between said sleeve and the casing.

As shown in Fig. 6, the recess and the shoulder 14 of corresponding shape are shown as a circle flattened on opposite sides. The outer face of the shoulder 14 is flush with the inner side of the top 11 so that when the switch parts are assembled the casing and shoulder are seated on the insulating disc 7.

The bottom of the recessed portion of the casing is provided with an aperture through which extends the sleeve 15, as the outer periphery of the sleeve is not threaded and a smooth and neat appearance is presented. This feature is a distinct improvement from all other forms heretofore used.

In order to rotate the spring contact 3, a rotary actuating pin 16 is provided having a handle portion which extends outwardly through the internally threaded sleeve 15. Preferably, the end of the pin 16 is provided with a slot 17 adapted to receive the flattened portion of the spring contact 3, which is insulated from the pin by a strip of flat insulating material 18 which is

bent around the flattened portion of the spring contact and forms an insulating lining for the slot 17.

The actuating pin 16 is provided with a notch or recess portion 19 which is adapted to receive the insulating disc 7 which in turn is provided with an aperture 20 adapted to receive the notched portion 10.

In order to facilitate the positioning of the insulating disc 7 within the notched portion of the pin 16, the insulating disc is preferably provided with a cut or slit portion 21 extending from the aperture 20 to the outer edge of the disc. When the parts of the switch are assembled, the insulating disc 7 serves to retain the actuating pin 16 in a centrally disposed position for actuating the rotary spring contact, and also prevents axial displacement of the actuating pin.

A modified form of actuating pin and insulating disc is shown in Figs. 16 and 17. The insulating disc 22 shown in Fig. 17 is not slotted but is merely provided with an aperture 23. The actuating pin is formed in two parts, comprising a handle portion 24 and a screw portion 25 adapted to pass through the aperture 23 in the disc and be threaded in one end of the handle portion 24.

The screw portion 25 is provided with a slotted head portion 26 adapted to receive the insulation and the flattened portion of the spring contact.

In order to provide a member which functions as a substantial bearing or guide for the actuating pin 16 and to also function as a fastening or securing means to enable the assembled switch structure to be secured to supports or panels covering a wide variation in thickness, an externally threaded sleeve 27 having a shoulder portion 28 is provided. The externally threaded sleeve 27 is threaded in the internally threaded sleeve 15 so that the sleeve 27 serves as a guide for the pin 16 and is adjustable axially or longitudinally thereof.

As indicated in Fig. 15, the assembled switch structure may be mounted on a panel or support 29 having a thickness which is even greater than the projecting portion of the sleeve 15 which projects through the aperture in the panel or support. This is a feature which would be impossible to accomplish in devices of the prior art employing an externally threaded member and a nut thereon for positioning the switch casing on a panel, canopy or other support.

As shown in Fig. 15, the support 29 and the switch casing is secured between the shoulder portions 14 and 28 of the internally and externally threaded sleeves 15 and 27 respectively.

In order to mount the switch assembly upon a relatively thin support, such as indicated in Figs. 1 and 14 where the canopy 30

or panel 31 is of a thickness less than the portion of the sleeve 15 projecting through the aperture of the support, a collar 32 may be provided which telescopes the projecting portion of the sleeve 15 so that one end of the collar engages the projecting shoulder 28 on the longitudinally adjustable sleeve 27, and the other end of the collar engages the support, preferably by a bent shoulder portion 33. (See Figs. 9, 10, and 14.)

While one preferred form of the invention has been shown and described herein, it is understood that various advantages and modifications may be made without departing from the spirit and scope of the invention as defined in the appended claims.

What we therefore claim and desire to secure by Letters Patent is:

1. An electric switch adapted to be mounted on a support including a switch body having contacts therein, a spring contact in said body adapted to be moved to different positions to complete and interrupt the circuit between said contacts, a casing for the body having an aperture therein, a rotary actuating member extending through the opening in the casing and arranged to rotate said spring contact, an internally threaded sleeve having a shoulder thereon independent of the casing and an externally threaded sleeve having a shoulder thereon adapted to be threaded in said internally threaded sleeve and to function as a guide for the rotary spring actuating member, whereby said switch may be mounted on the support held between the projecting shoulders on the internally and externally threaded sleeve members.

2. In an electric switch of the rotary type comprising a switch body, contacts therein, a rotatable spring switch cooperating with the contacts, a casing having an aperture therein and a rotary member extending through said aperture for actuating said spring contact, means for mounting said switch upon a panel and for guiding said rotary member, including an internally threaded sleeve independent of the switch casing, and held against rotation therein, and an externally threaded sleeve having a shoulder thereon adapted to function as a guide for said rotary member and be reciprocable longitudinally thereof whereby the switch may be mounted on panels of varying thickness by adjusting the externally threaded sleeve longitudinally of the rotary spring switch actuating member.

3. An electric switch comprising an insulating body having a recess therein, spaced terminal contacts and a spring contact therebetween in said recesses, said spring contact including a flat portion, a switch casing having an aperture therein forming a covering for the body, a rotary actuating member projecting through the aperture in said casing, an insulating member mounted on said rotary actuating member, said insulating mem-

ber being mounted between the casing and the body and serving to retain the contacts and spring contact in position, a slot in the end of said rotary member adapted to receive the flat portion of the spring contact, and means for insulating said spring contact from said rotary actuating member.

4. An electric switch comprising an insulating body having a recess therein, spaced terminal contacts and a spring contact therebetween in said recesses, said spring contact including a flat portion, a switch casing having an aperture therein forming a covering for the body, a rotary actuating member projecting through the aperture in said casing, an insulating member mounted on said rotary actuating member, said insulating member being mounted between the casing and the body and serving to retain the contacts and spring contact in position, a slot in the end of said rotary member adapted to receive the flat portion of the spring contact, means for insulating said spring contact from said rotary actuating member, a means for guiding said rotary spring switch actuating member including an internally threaded sleeve independent of the casing, but held against rotation therein, said sleeve having a portion extending through the opening in said casing, and an externally threaded sleeve threaded in said internally threaded sleeve and movable longitudinally of the projecting rotary switch actuating member, said externally threaded sleeve also serving as a guide for said switch actuating member.

5. An electric switch comprising an insulating body having a recess therein, spaced terminal contacts and a spring contact therebetween in said recesses, said spring contact including a flat portion, a switch casing having an aperture therein forming a covering for the body, a rotary actuating member projecting through the aperture in said casing, an insulating member mounted on said rotary actuating member, said insulating member being mounted between the casing and the body and serving to retain the contacts and spring contact in position, a slot in the end of said rotary member adapted to receive the flat portion of the spring contact, means for insulating said spring contact from said rotary actuating member, a means for guiding said rotary spring switch actuating member including an internally threaded sleeve independent of the casing, but held against rotation therein, said sleeve having a portion extending through the opening in said casing, and an externally threaded sleeve threaded in said internally threaded sleeve and movable longitudinally of the projecting rotary switch actuating member, said externally threaded sleeve also serving as a guide for said switch actuating member, said externally threaded sleeve having a shoulder at one end, and a panel having an aperture

therein on which said switch is adapted to be mounted, said panel being secured between the casing and the shoulder on the externally threaded sleeve.

In testimony whereof we affix our signatures.

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