March 14, 1967 W. GLUCK 3,309,485

ILLUMINABLE SLIDE SWITCH

Filed Dec. 23, 1965

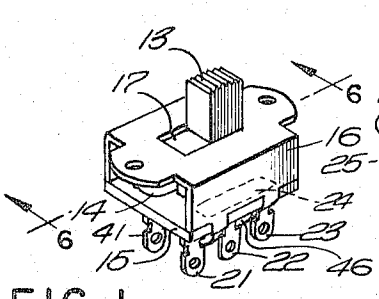


FIG. 1

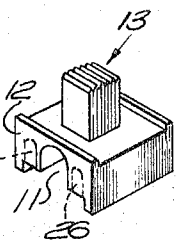


FIG. 2

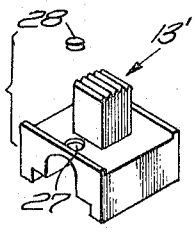


FIG. 3

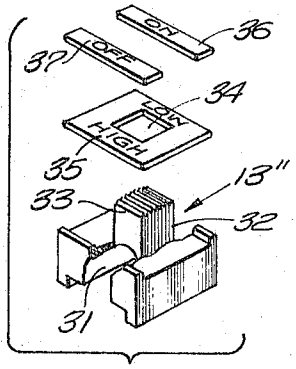


FIG. 4

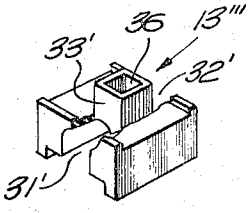


FIG. 5

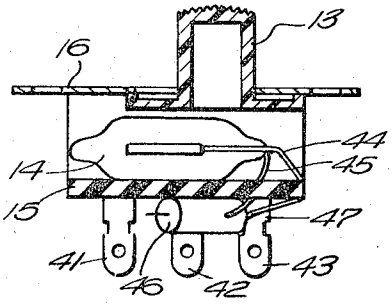


FIG. 6

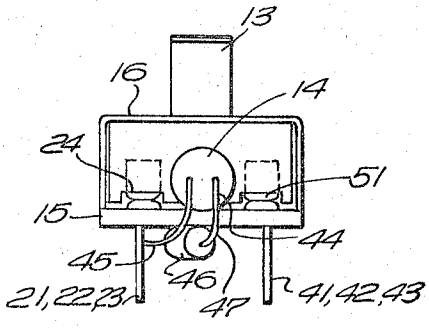


FIG. 7

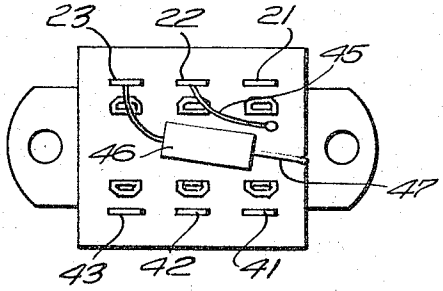


FIG. 8

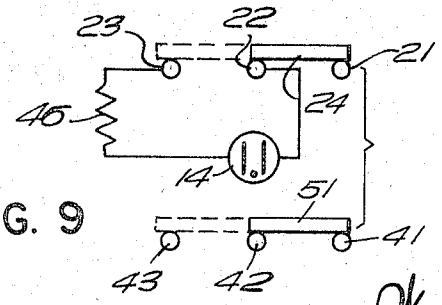


FIG. 9

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3,309,485

ILLUMINABLE SLIDE SWITCH

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10 Claims. (Cl. 200—167)

The present invention relates in general to selectively illuminable switches and more particularly concerns a novel selectively illuminable electric slide switch in which the feature of selective illumination is made available within the confines of a conventional slide switch package at a relatively slight increase in cost.

It is an important object of this inveniton to provide a selectively illuminable slide switch.

It is another object of the invention to achieve the preceding object by using a conventional slide switch package.

It is still a further object of the invention to achieve the preceding objects at relatively slight increase in cost.

According to the invention, there are a number of fixed contacts insulatedly separated and supported in a base. Sliding contact means is arranged for selectively interconnecting adjacent ones of the spaced contacts along essentially a linear path of relative movement. Illuminable light bulb means is arranged closely adjacent to and generally parallel to the linear path of relative movement. Actuating means is provided for establishing relative movement between the sliding contact means and the number of insulatedly separated contacts along the essentially linear path. Means including the base and actuating means enclose the illuminable light bulb means and have a translucent portion for transmitting light from the bulb means when illuminated.

Numerous other features, objects and advantages of the invention will become apparent from the following specification when read in connection with the accompanying drawing in which:

FIG. 1 is a perspective view of a slide switch having an internal illuminable light bulb for providing externally visible light;

FIG. 2 is a perspective view of a slide switch handle of translucent material according to the invention;

FIG. 3 shows a slide switch handle of opaque material having a translucent insert for transmitting light from the internal bulb when illuminated;

FIG. 4 shows still another form of slide switch handle of opaque material having slots for maximally transmitting light from the illuminable bulb;

FIG. 5 is a perspective view of still another slide switch handle having a chimney-like opening for transmitting a relatively large amount of the light from the internal bulb especially useful under rocker, toggle and other types of actuators;

FIG. 6 is a longitudinal sectional view through section 6—6 of FIG. 1;

FIGS. 7 and 8 are end and bottom views respectively of the illuminable slide switch of FIG. 1; and

FIG. 9 is a schematic circuit diagram of a technique for wiring the bulb so that the light is illuminated when the load is on.

With reference now to the drawing and more particularly FIG. 1 thereof, there is shown a perspective view of an exemplary embodiment of the invention in which the basic switch structure is generally of the type disclosed in Gluck U.S. Patent No. 3,072,757. However, the principles of the invention are applicable to any type of slide switch.

The specific switch shown in FIG. 1 is a double-throw double-pole slide switch generally of the type shown in FIGS. 9 and 10 of the aforesaid patent but having a central groove 11 in front wall 12 (FIG. 2) of translucent

handle 13 so that the handle may slide over illuminable bulb 14 inside the housing including contact base plate 15, metal housing 16 and switch handle 13 protruding through aperture 17 in housing 16. A row of terminals 21, 22 and 23 depend from corresponding fixed contacts, adjacent ones of which are selectively interconnected by slide 24, shown dotted in FIG. 1. Handle 13 may be translucent as shown in FIGS. 1 or 2. As best seen in FIG. 2 handle 13 may be formed with a longitudinal groove 25 on one side of groove 11 and another longitudinal groove 26 on the other side of groove 11 for accommodating the respective sliding contacts for the two-pole switch shown.

Referring to FIG. 3, there is shown a perspective view of an opaque handle 13' essentially the same in structure as handle 13 but formed with a circular opening 27 for accommodating a translucent lens 28 that transmits light when bulb 14 is illuminated.

Referring to FIG. 4, there is shown still another form which the switch handle may take. Switch handle 13' is formed with openings 31 and 32 forward and rearward of protrusion 33 that may snugly fit within the rectangular opening 34 of the translucent single piece 35 or separate translucent strips 36 and 37.

Referring to FIG. 5, there is shown still another slide switch handle 13''' patterned structurally generally along the lines of handle 13'' but formed with a hollow protrusion 33' so that light may be transmitted not only through openings 31' and 32', but also through chimney-like opening 36. This handle is especially convenient for use with a toggle-operated slide switch of the type shown in FIG. 12 of the aforestaid patent or the rocker-arm actuated switch generally of the type commercially available from UID Electronics Corp. of Hollywood, Florida. In such switches the rocker arm, the toggle and/or toggle housing would preferably be translucent.

Referring to FIG. 6, there is shown a longitudinal sectional view through section 6—6 of FIG. 1 more clearly illustrating how neon glow bulb 14 may be internally positioned. FIG. 6 shows the three terminals 41, 42 and 43 depending from corresponding in-line contacts supported in insulating base 15. Bulb 14 has two leads 44 and 45 and is connected in series with resistor 46. Lead 44 is connected to lead 47 of resistor 46. The other lead of resistor 46 is connected to terminal 23. Lead 45 of bulb 14 passes through an opening in base 15 and is connected to center terminal 22.

Referring to FIG. 7, there is shown an end view of the switch shown in FIG. 1. This view not only clearly shows the arrangement of the bulb 14 and resistor 46, but also more clearly shows the arrangement of the sliding contacts 24 and 51 on opposite sides of the bulb 14 as described above. FIG. 8 is a bottom view of the switch of FIG. 1 helpful in further understanding how the physical connections are made.

Referring to FIG. 9, there is shown a schematic circuit diagram of a suitable switching arrangement in which the double-throw single-pole switching means comprising fixed terminals 21, 22 and 23 and their associated fixed contacts and sliding contact 24 function to both switch the line voltage on terminal 21 to a load connected to center terminal 22 and to switch this voltage across the series combination of bulb 14 and current limiting resistor 46 to ignite bulb 14 when the load connected across terminal 22 and the line connected to terminal 23 is energized. The second pole associated with sliding contact 51 and fixed terminals 41, 42 and 43 is still available to perform another switching function.

The double-pole double-throw arrangement shown is by way of example for illustrating a preferred embodiment of the invention. The principles of the invention

are applicable to single-pole switches and multiple-pole multiple-throw arrangements. The principles of the invention are also applicable to igniting more than one bulb, especially where the slide switch comprises three or more poles. In an exemplary embodiment of the invention actually constructed with a single-pole arrangement, an NE–2h neon bulb was employed. It is within the principles of the invention to employ other bulbs, such as incandescent bulbs. It is also within the principles of the invention to employ different circuit arrangements for selectively illuminating the internal illuminable bulb means. For example, it is within the skill of those having ordinary skill in this electrical art to wire the arrangement for load on-lamp off operation and load off-lamp on operation and to use the contacts associated with one pole for only controlling the illumination of the bulb while using the contacts associated with other poles to control functions in external circuits. The foregoing modifications and uses are by way of example only and not as a limitation on the invention.

For a circuit arrangement in which the line voltage varies from 105–125 volts A.-C. a neon bulb in series with a resistor of the order of 30,000 ohms results in adequate illumination of the bulb without excessive current being drawn.

The practical significance of the invention is better appreciated when one realizes the enormous number of electrical products, such as amplifiers, instruments and other products too numerous to mention, having separately wired and housed light bulbs to indicate the condition of a switch-selected function. The present invention not only eliminates the cost and wasted space associated with such separate light assemblies, but also ties the indication of the condition unambiguously to the switch controlling the condition at negligible additional cost over the switch cost alone and at no increase in panel area over that occupied by the switch itself.

It is apparent that those skilled in the art may now make numerous uses and modifications of and departures from the specific embodiments described herein without departing from the inventive concepts. Consequently, the invention is to be construed as embracing each and every novel feature and novel combination of features present in or possesed by the apparatus and techniques herein disclosed and limited solely by the spirit and scope of the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An illuminable slide switch comprising,
a base,
a plurality of insulatedly separated contacts supported essentially in line in said base,
sliding contact means for selectively interconnecting adjacent ones of said plurality of contacts,
means supporting said base and said sliding contact means for relative movement along a substantially linear path embracing said plurality of contacts to selectively interconnect adjacent ones of said contacts,
illuminable light bulb means supported closely adjacent and generally parallel to said path,
means responsive to establishment of a predetermined relative position between said sliding contact means and said plurality of contacts for illuminating said bulb means,
actuating means establishing relative movement between said sliding contact means and said plurality of contacts along said path,
and means including said base and said actuating means surrounding said illuminable bulb means,
said means including translucent means for transmitting light from said illuminable bulb means when the latter is illuminated to the outside of said means for surrounding.

2. An illuminable slide switch in accordance with claim 1 wherein said actuating means comprises a first housing having means defining compartment means surrounding said sliding contact means and relatively movable with respect to said base,
said compartment means being closely adjacent to and generally parallel to said illuminable bulb means,
said first housing having an end wall formed with a groove for accommodating said illuminable bulb means.

3. An illuminable slide switch in accordance with claim 2 wherein said first housing is formed with at least one translucent portion immediately adjacent to said illuminable bulb means which portion comprises said translucent means.

4. An illuminable slide switch in accordance with claim 3 wherein said means comprises a second housing in fixed relationship relative to said base and coacting with said base to define first housing compartment means for accommodating said first housing,
said second housing formed with an aperture having a projection on said illuminable bulb means,
said actuating means including handle means in fixed relationship relative to said first housing and extending through said aperture.

5. An illuminable slide switch in accordance with claim 4 wherein said first housing and said handle means is a unitary structure of translucent material.

6. An illuminable slide switch in accordance with claim 4 wherein said first housing and said handle means is a unitary structure with said at least one translucent portion in a wall of said first housing spaced from and generally parallel to said base plate and registrable with said aperture so that light from said illuminable bulb means may be transmitted through said aperture and said at least one translucent portion.

7. An illuminable slide switch in accordance with claim 6 wherein said handle means is formed with a handle translucent portion comprising said translucent means which latter portion is in fixed relation to and registrable with said at least one translucent portion so that light from said illuminable bulb means may also be transmitted through said handle translucent portion.

8. An illuminable slide switch in accordance with claim 4 wherein said illuminable bulb means comprises a neon bulb having first and second electrodes and further comprising,
means connecting said first electrode to one of said plurality of contacts,
and a resistor adjacent to said base and outside said means connecting said second electrode to another of said plurality of contacts.

9. An illuminable slide switch in accordance with claim 6 wherein said illuminable bulb means comprises a neon bulb having first and second electrodes and further comprising,
means connecting said first electrode to one of said plurality of contacts,
and a resistor adjacent to said base and outside said means connecting said second electrode to another of said plurality of contacts.

10. An illuminable slide switch in accordance with claim 7 wherein said illuminable bulb means comprises a neon bulb having first and second electrodes and further comprising,
means connecting said first electrode to one of said plurality of contacts,
and a resistor adjacent to said base and outside said means connecting said second electrode to another of said plurality of contacts.

No references cited.

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