Aug. 7, 1962 J. H. HOPKINS 3,048,674

ARTICLE OF MANUFACTURE

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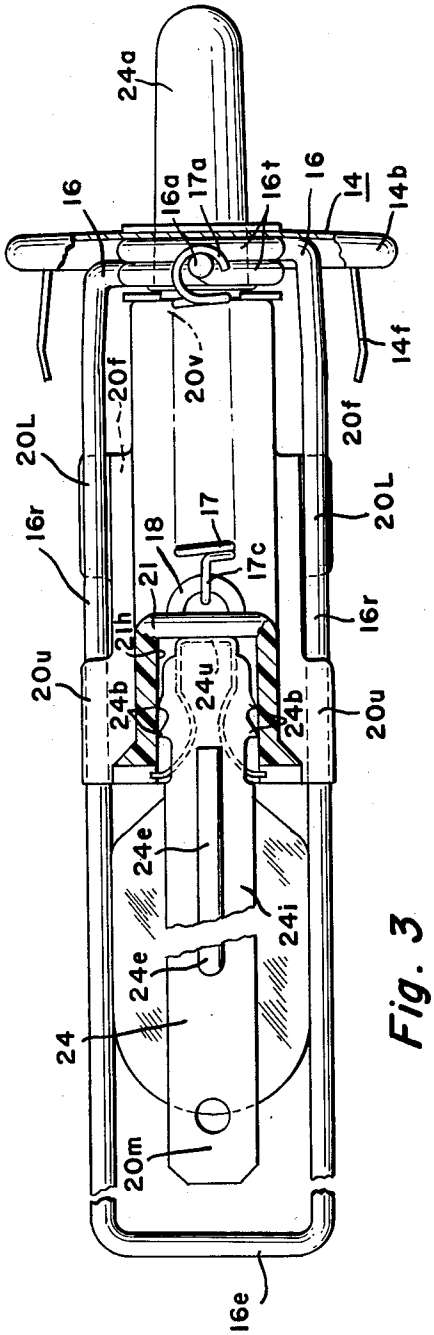


Fig. 3

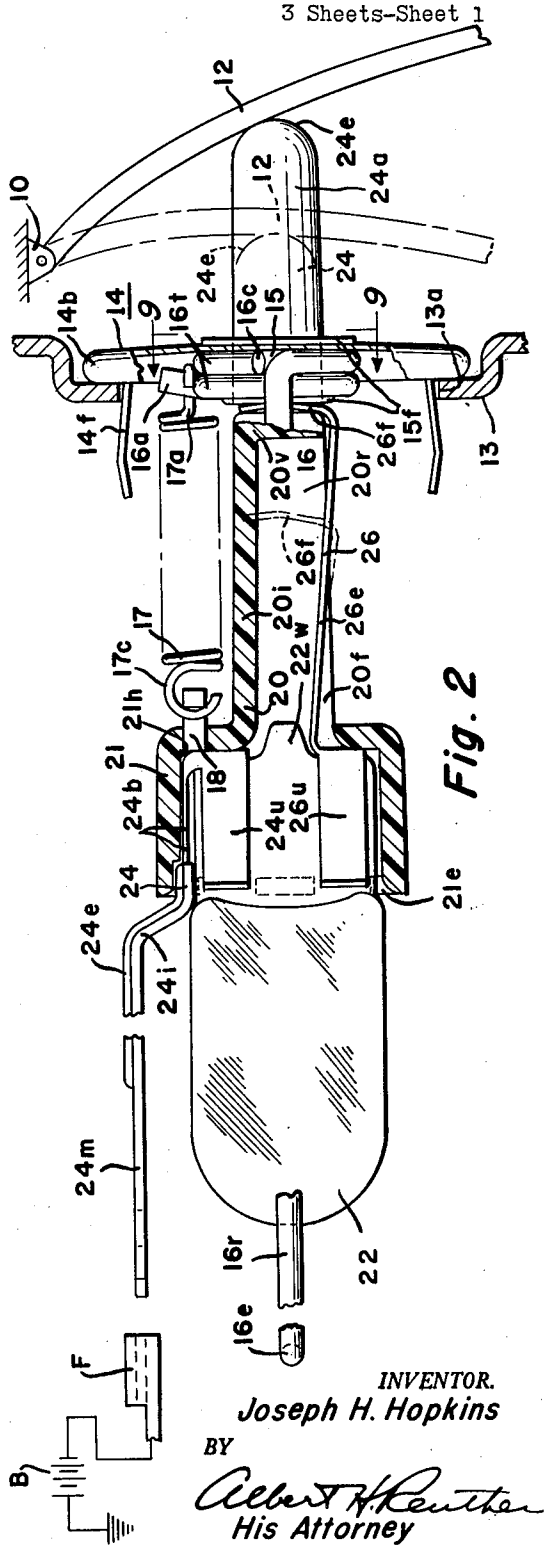


Fig. 2

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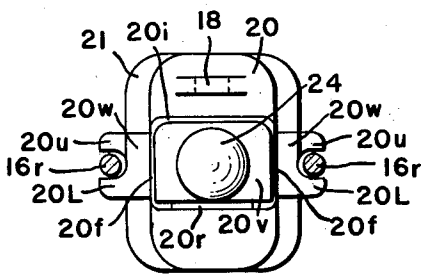


Fig. 4

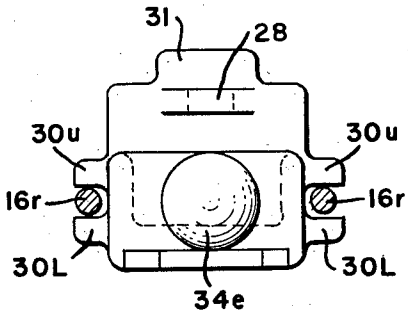


Fig. 8

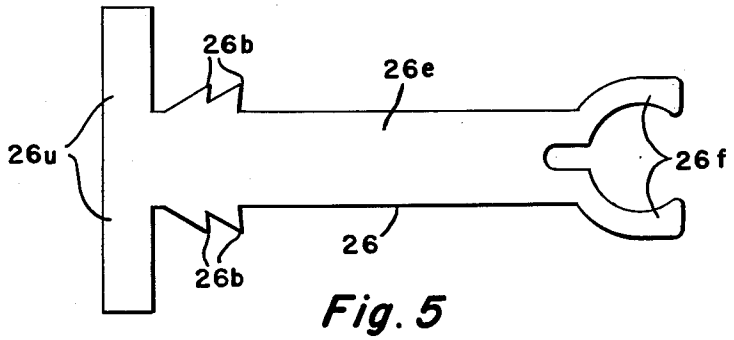


Fig. 5

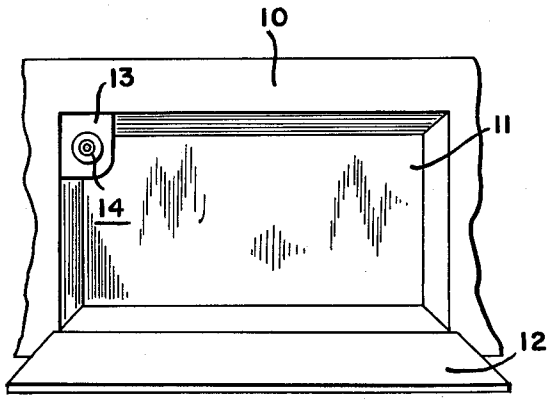


Fig. 1

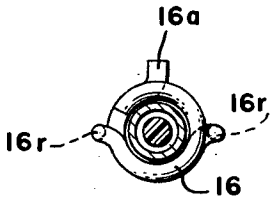


Fig. 9

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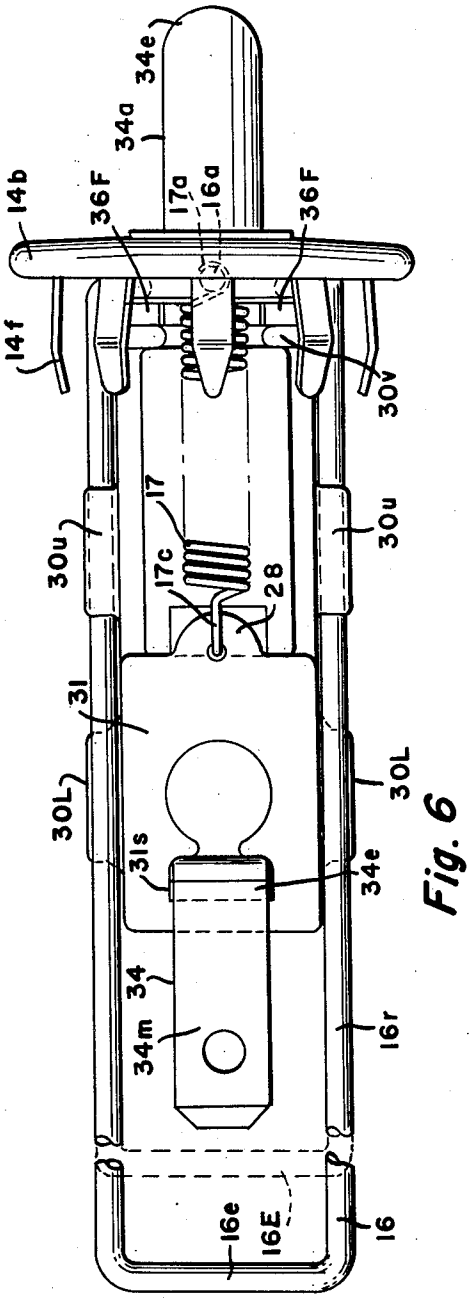


Fig. 6

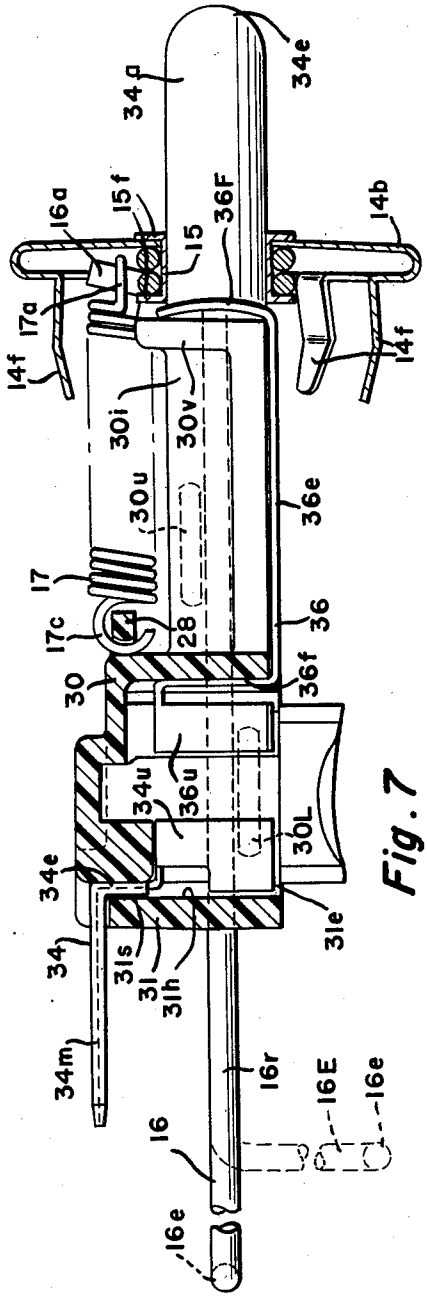


Fig. 7

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United States Patent Office 3,048,674
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3,048,674

ARTICLE OF MANUFACTURE

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Filed Aug. 5, 1960, Ser. No. 47,642
8 Claims. (Cl. 200—61.7)

This invention relates to a lamp and switch assembly and, particularly to combined lamp-retainer and switch means operable in response to movement of a member adjacent thereto.

An object of this invention is to provide a new and improved lamp-retainer and switch means economical to produce and having structure to assure smooth to and fro movement during switching.

Another object of this invention is to provide a combined lamp-retainer and switch means having a cage-like longitudinal guide means adapted to be fitted as a cantilever mounting to support a reciprocable insulating body including an actuator-plunger portion carried on one side of a lamp receptacle portion in which electrical connector means can be retained.

Another object of this invention is to provide lamp-retainer-switch structure including a guide means having a pair of substantially parallel side rail portions along which an insulating body can be reciprocally moved over a predetermined distance against resilient bias in one direction and including a lamp-retainer portion of insulating material integrally including a plunger portion to extend substantially intermediate the side rail portions which are frictionally engageable by complementary extensions at least a pair of which extend laterally from the lamp-retainer portion yet all adapted to fit through a mounting aperture adjacent to which a member such as a glove compartment door can be moved into engagement with an end of the plunger portion so as to permit shift of an extension of electrical connector means in the lamp-retainer portion into lamp energizing and de-energizing positions.

A further object of this invention is to provide a lamp-retainer and switch assembly including in combination an external guide means having a longitudinally extending rail means traversible by a body portion of insulating material at least in part complementary to the rail means and including lamp-retainer means and plunger means axially spaced adjacent to each other such that an end of the plunger means can extend through a mounting member electrically engageable by an extension of electrical connector means mounted in the lamp-retainer means biased normally into a position for electrical energization.

Another object of this invention is to provide a lamp-retainer and switch assembly including a centrally apertured plug-like mounting button retained concentrically over a radially outwardly flanged sleeve-like eyelet around which opposite ends of a wire-like guide means are twisted, one of the ends having a predetermined position extending outwardly as a post engaged by one end of tension spring means having an opposite end fitted into engagement with a body portion of insulating material formed to have a socket in which electrical connectors having U-shaped contacts are held, one of the connectors having a lateral male blade extension and the other having bifurcated-end and flanged extension for electrically engaging the eyelet, this latter extension having a position adjacent to longitudinally extending plunger means integral with the body portion having at least a pair of lateral projections complementary and engageable along substantially parallel rail-like legs of the guide means formed like a loop the closed end of which limits movement of the body portion in one direction.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein preferred embodiments of the present invention are clearly shown.

In the drawings:

FIGURE 1 is a plan view of a vehicle dash board storage compartment fitted with a lamp-retainer and switch means in accordance with the present invention.

FIGURE 2 is a partially sectioned elevational view of lamp-retainer and switch means of the present invention.

FIGURE 3 is a partially sectioned top view of the lamp-retainer and switch means of FIGURE 2.

FIGURE 4 is an end view of a component of structure in FIGURES 2 and 3.

FIGURE 5 is a blank view of a component of structure in a lamp-retainer and switch means in accordance with the present invention.

FIGURE 6 is a top view of the lamp-retainer and switch means assembly also in accordance with the present invention.

FIGURE 7 is a partially sectioned elevational view of the assembly of FIGURE 6.

FIGURE 8 is an end view of a component of structure in FIGURES 6 and 7.

FIGURE 9 is a fragmentary sectional view taken along line 9—9 in FIGURE 2.

FIGURE 1 shows a fragmentary plan view of a motor vehicle dashboard **10** having a storage compartment **11** box-like shape and open along one side subject to closure by a cover or member **12** hinged in a suitable manner relative to the dashboard **10**. The pivotal or hinged relationship of member **12** to the dashboard **10** is indicated further in FIGURE 2. The box-like compartment **11** can be formed of any suitable material used to provide walls having a periphery thereof secured to one side of the dashboard. Means for illuminating such a compartment **11** are generally energized and de-energized in accordance with opening and closing of access to the compartment **11** by latching and unlatching of the cover member **12** relative to the dashboard. Adjacent to a corner of the compartment **11**, there is a metal mounting flange **13** integral with the dashboard **10** or carried thereby and having an opening or aperture **13***a* of a predetermined diameter to permit mounting and insertion of a combined lamp-retainer and switch means generally indicated by numeral **14** having features in accordance with the present invention.

Components and structure in a lamp-retainer and switch assembly can include the following parts. First, there is a centrally apertured plug-like mounting button **14***b* having a plurality of cam-like spring fingers **14***f* adapted to provide resilient peripheral engagement relative to an inner edge of the mounting aperture **13***a*. The plug-like button **14***b* is mounted concentrically outside a cylindrical metal sleeve or eyelet **15** visible in FIGURES 2–3 and 6–7. This metal sleeve or eyelet includes a pair of radially outwardly bent or swaged flanges **15***f* such that a guide means **16** can be fitted thereto as a cantilever mounting in accordance with the present invention. FIGURES 2–3 and 6–7 as well as 9 illustrate the guide means **16** including a pair of substantially parallel rail portions **16***r* joined to each other by a transverse end portion **16***e* to form a closed loop of wire-like material extending laterally from the sleeve **15** and spring-finger button chiefly on a back side of the apertured mounting panel **13**. Substantially in planar alignment with the apertured panel **13**, there are opposite ends wrapped or twisted as indicated by numeral **16***t* around an outer periphery of the metal sleeve or eyelet **15**. One such end has a cut-off **16***c* located radially adjacent to an outer periphery of the metal sleeve or eyelet

15 and the remaining end terminates as a radially outwardly extending abutment 16*a* engageable by an end 17*a* of a tension spring means 17. Axial or longitudinal lengths of the metal sleeve or eyelet 15 is such that substantially two turns of the rail means ends can be made between flanges 15*f* so as to effect wedging of these ends against one side of the plug-like button 14*b* as illustrated in the drawings.

Spring means 17 has another C-shaped end 17*c* hooked into engagement with a projection or semi-circular eyelet 18 of insulating material integral and carried by an insulating body 20. The insulating body 20 includes a socket or lamp-retainer portion 21 having a hollow interior 21*h* and an open end 21*e* into which a base such as 22*w* of a lamp bulb 22 can be fitted. Length of the substantially parallel side rails 16*r* is such that this bulb 22 can be moved reciprocally in an axial direction therebetween for a predetermined distance corresponding to a path of movement of the socket or lamp retainer portion 21 in response to opening and closing of the cover or member 12 on one side of the compartment 11. The insulating body includes an intermediate portion 20*i* that joins the socket or lamp retainer portion 21 integrally with an axially extending plunger 24*a* having a curved end 24*e* engageable by one side of the cover or member 12.

FIGURE 4 is an end view of the insulating body 20 alone including the integral socket or lamp retainer portion 21 as well as the plunger or axial projection 24*a* joined to each other by the intermediate portion 20*i*. An axial recess 20*r* is defined by the intermediate portion 20*i* and communicates at one end with the hollow interior 21*h* of the socket or lamp-retainer portion 21. The recess 20*r* is open also along a bottom side but is closed laterally by downwardly extending flanges 20*f*. A pair of lateral web-like extensions 20*w* are provided extending integrally from the insulating body 20 to a width externally substantially the distance between the substantially parallel rail portions 16*r* as visible in FIGURES 3 and 4. Each of these web-like portions 20*w* forms a bottom of a recess or U-shaped groove further defined by an upper pair of integral projections 20*u* and a lower pair of integral projections 20L provided in longitudinally spaced apart relationship to each other on each of separate sides of the insulating body 20. FIGURES 3 and 4 show the upper projections 20*u* extending laterally outwardly from the socket or lamp-retainer portion 21 and lower projections 20L spaced laterally apart and longitudinally away from the upper projections such that a pair of upper and lower projections on each side straddle the rail portion 16*r* and are substantially complementary thereto and slidably engageable along each of the substantially parallel rail portions. These upper and lower projections as well as the plunger 24*a* extending through the central aperture of the plug-like button 14*b* and hollow sleeve 15 serve to stabilize reciprocal movement of the insulating body 20 relative to the cantilever-like support of the guide means 16 carried by the sleeve and plug-like button.

Metal electrical connector means can be fitted to the hollow interior 21*h* of the socket or lamp-retainer portion of the insulating portion 20. Electrical connector means illustrated in the drawings are for use with an electric light bulb 22 having a glass web base portion 22*w* of a type shown and described both in U.S. Patents 2,924,736—Kotsch and 2,937,308—Howles et al. The electrical connector means include a pair of U-shaped contacts 24*u* and 26*u* respectively similar to contacts disclosed in a copending application, S.N. 628, filed January 5, 1960, and belonging to the assignee of the present invention. FIGURE 3 of the drawings indicates such a U-shaped contact in an end view integral with terminal means 24 adapted for use in accordance with the present invention. Terminal means 24 as seen in FIGURES 2 and 3 includes not only the U-shaped contact portion 24*u*, but also a longitudinally extending male blade portion 24*m* laterally offset by an intermediate portion 24*i* integral with an embossed portion 24*e* for strength between the male blade 24*m* and the intermediate portion 24*i* as well as barbed binding portion 24*b*. This barbed binding portion 24*b* has pairs of oppositely extending projections that frictionally engage opposite inner surfaces of the hollow interior 21*h* so as to maintain the U-shaped portion 24*u* and male blade portion 24*m* in a predetermined positioning relative to the socket or lamp-retainer portion 21. As indicated schematically in FIGURE 2, the male blade portion 24*m* is adapted to be electrically engaged by a female terminal means F electrically energized from a battery B suitably grounded in a well-known manner. The female terminal means F can be of a type disclosed in U.S. Patent 2,682,038—Johnson, belonging to the assignee of the present invention. This female terminal means F is connected to the male blade portion 24*m* after the lamp-retainer and switch means 14 is mounted in the apertured panel or flange portion such as 13. The U-shaped contacts 24*u* and 26*u* establish electrical connection with filament means (not shown) of the lamp bulb 22. The U-shaped contact portion 26*u* is integral with an extension 26*e* projecting resiliently through the recess 20*r* and terminating in a bifurcated end portion or transverse slotted flange 26*f* adapted to abut against a transverse or vertical wall portion 20*v* joining the intermediate portion 20*i* as well as the substantially parallel flange portions 20*f*. It is apparent that the bifurcated end or flange portion 26*f* visible in FIGURE 5 is adapted to fit complementary to and straddle the plunger portion 24*a* used as an actuator to effect reciprocable shifting of the insulating body 20 in response to movement of member 12 and along a linear path defined by the rail portions 16*r* of the guide means 16 in accordance with the present invention. The U-shaped contact portion 26*u* as well as the extension 26*e* and bifurcated or flanged end 26*e* form a secondary terminal means 26 further including barbed binding portions 26*b* both visible in FIGURE 5. When the cover or member 12 is pivoted to a position permitting access to the compartment 11, the plunger or actuator portion 24*a* is shifted to the right as seen in FIGURE 2 due to normal biasing by tension spring means 17 stretched between the abutment 16*a* and eyelet 18 as described earlier. Thus the terminal contact means as well as the insulating body 20 and integral actuator or plunger 24 together with the lamp bulb 22 mounted relative to the contacts move as a unit guided by rail portions 16*r*. In FIGURE 2, there is phantom outline of the bifurcated or flange end 26*f* of contact 26 together with a phantom positioning of the end 24*e* of the plunger or actuator 24*a* engaged by the cover or movable member 12 so as to interrupt electrical connection between the bifurcated end or flange portion 26*f* and a flange 15*f* of the sleeve or eyelet 15 attached to the metal plug-like button 14*b* snapped into engagement with the metal mounting panel 13 suitably grounded electrically as schematically indicated in FIGURE 2. The bifurcated or flange end portion 26*f* of the terminal means 26 effects stabilization of the engagement of this terminal means to the insulating body 20 and assures positive electrical engagement of the sleeve or eyelet 15. The rail portions 16*r* provide resilient cantilever support for the insulating body 20 which carries the electrical means as well as the lamp bulb 22. The female terminal means F and any suitable electrical housing or covering therefor also move together with the male blade portion 24*m* in a to and fro path. The female terminal means can be suitably attached to an end of an insulating conductor which extends from a suitable wiring harness behind the dashboard cap. The combination lamp socket body and plunger shown in FIGURE 2 and elsewhere in the drawings can slide on wire guides with the plunger or actuator sliding through the sleeve or

eyelet which holds the wire guide and plug-like button together for cantilever-like mounting. Projections **20***u* and **20**L serve as means forming guide bearing surfaces integral with the insulating body such as **20**. The structure and assembly of FIGURES 2 and 3 is such that lateral dimensions thereof permit insertion of the combination lamp-retainer and switch means through a mounting aperture such as **13***a* even when the bulb **22** is fitted to the terminal means **24** and **26** prior to mounting of the assembly in the dashboard.

It is to be understood that in some instances, it may be desirable to have the lamp bulb extend laterally transversely relative to the linear path of movement established by the guide means such as **16**. A slightly shorter length of guide means can be used when the lamp bulb is insertable transversely rather than axially as shown in FIGURES 2 and 3. Also, replacement of such lamp bulb means can be facilitated by having the lamp bulb mounted transversely or substantially at right angles with respect to the path of movement established by the rail portions **16***r* of the guide means **16**. Accordingly, in FIGURES 6 and 7, there is shown an insulating body **30** having a socket or lamp-retainer portion **31** with a hollow interior **31***h* comparable to the socket **21** but located to have an open end **31***e* provide access to the hollow interior substantially at right angles to the path reciprocal movement established by guide means such as **16**. Except for this modification of the socket portion of the insulating body, parts such as the guide means, plug-like button, tension spring means **17** and sleeve or eyelet **15**, are identical in structure and purpose described previously with reference to other views and therefore identical reference numerals are applied where such similarity exists. Insulating body **30** has a hook portion **28** carried thereby and engaged by an end **17***c* of the spring **17**. The insulating body **30** includes a slot **31***s* which extends from the hollow interior **31***h* to the outside thereof such that a terminal means **34** having a male blade end portion **34***m* can project axially from the insulating body and can be engaged by a female terminal means such as F indicated in FIGURE 2. The terminal means **34** also includes a U-shaped contact portion **34***u* integral therewith and joined to the male blade portion **34***m* by an elbow portion **34***e* that fits into the slot **31***s*. The blade portion **34***m* is initially longitudinally in alignment with the elbow portion **34***e* but after insertion of the blade portion and the elbow portion through the slot **34***s*, the blade portion **34***m* is bent substantially at right angles to the elbow portion so as to extend axially from the insulating body **30** and substantially parallel to the side rail portion **16***r* of the guide means **16**. Thus, the male blade portion again provides means for connecting a source of power for energization of the light bulb connectible to terminal means in the socket **31**. In addition to terminal means **34** with the integral male blade portion **34***m*, there is a secondary terminal means **36** including a U-shaped contact portion **36***u* also fitted into the hollow interior **31***h* of the socket **31**. Terminal means **36** includes a lateral flange mounting portion **36***f* which can have barbs for binding purposes with a configuration similar to that identified by reference numeral **26***b* in FIGURE 5. The terminal means **36** also includes an extension **36***e* that terminates in a crescent-shaped end or bifurcated flange contact portion **36**F electrically engageable with the sleeve or eyelet such as **15**. This bifurcated end is adapted to straddle plunger or actuator portion **34***a* with an end **34***e* and integral with an intermediate body portion **30***i* of the insulating body **30**. The bifurcated end **36**F is backed by a vertical wall portion **30***v* and bearing surfaces for engagement between the guide means and insulating body **30** and include upper lateral projections **30***u* as well as lower lateral projections **30**L visible in FIGURES 6, 7 and 8. The assembly of FIGURES 6 and 7 including the insulating body **30** can be fitted through a mounting aperture such as **13***a* without the lamp bulb inserted into position. The lamp bulb such as **22** can be fitted to the terminal means **34** and **36**, particularly the U-shaped contact portions **34***u* and **36***u* respectively. The integral plunger **34***a* and socket **31** of the insulating body **30** can be inserted between the wire guides or rail portions **16***r* sideways during subassembly thereof such that the insulating body **30** can be turned 90° about its longitudinal axis until temporary spreading of the resilient wire portions or rails **16***r* results in co-planar or parallel alignment of the guide surfaces of the insulating body relative to the rail portions **16***r*. After this assembly, the transverse end **16***e* of the wire guide means in a location opposite to the end secured to the plug-like button and sleeve or eyelet can be bent substantially at right angles as indicated by reference numeral **16**E into limit stop indicated in FIGURES 6 and 7. This limit stop **16**E is engageable by the lower lateral projections **30**L for example and the transverse end portion **16***e* provides a guard or shield for any light bulb such as **22** fitted into the U-shaped contact portions **34***u* and **36***u* to project substantially transversely to the path of to and fro movement. Energization and de-energization of the lamp bulb is effected by engagement of the end **34***e* of the plunger or actuator **34***a* integral and shiftable together with the contact means as well as the socket portion **31** of the insulating body **30**.

While the embodiments of the present invention as herein disclosed constitute preferred forms, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. A lamp-retainer and switch assembly adapted to fit through a mounting aperture of a panel on one side of a compartment subject to closure by a cover, door and the like, comprising, a centrally apertured plug-like mounting button peripherally engageable per se in the mounting aperture, a radially outwardly flanged sleeve retained only by said button in a location concentrically inside said button and spaced from the panel, a wire-like guide means having a pair of substantially parallel and laterally separated rail portions provided as part of a closed loop configuration, the opposite ends of which are wrapped specifically around said sleeve though one such end is left to project radially outward therefrom in a location freely spaced from the panel, a body portion of insulating material formed to have a socket in which electrical connector means can hold a lamp energizable for illumination, a plunger means extending from said socket of said body portion through said sleeve, means on said body portion for complementary sliding engagement along said side rail portions in response to force against plunger means at one end thereof, and spring means secured at one end to said body portion and at an opposite end to said radially projecting free end of said wire-like guide means for biasing said plunger means and body portion normally in one direction to effect electrical engagement between said sleeve and said electrical connector means.

2. The assembly of claim 1 wherein said guide means are bent laterally to form an integral limit stop engageable by said body portion, said means for sliding engagement including a pair of lateral projections extending from opposite sides of said body portions to form grooves complementary to said rail portions that are slidably engaged.

3. The assembly of claim 1 wherein said plunger means and said socket integrally form said body portion of insulating material having a width to fit in between said rail portions which can be inserted through the mounting aperture from one side, said spring means being coiled to be extendable under tension in a location offset laterally and adjacent to said plunger means and electrically separated from said electrical connector means by said body portion of insulating material.

4. The assembly of claim 1 wherein said body portion

and plunger means are integral with and joined by an intermediate flange portion including a pair of opposite stabilizing projections extending outwardly thereof to be engageable along said rail portions to supplement said complementary sliding means of said body portion, said electrical connector means including spaced U-shaped contacts in the socket each having a laterally outwardly extending extension projecting from said socket, one said extension terminating in a male blade extending substantially axially from said socket in a direction away from said plunger means and the other extension having a flange end extending toward said plunger means and electrically engageable against said sleeve.

5. Lamp-retainer switch structure for use in illumination on one side of an apertured panel comprising, guide means having a pair of substantially parallel laterally-spaced substantially axially extending side rail portions to be cantilever supported from the panel, an insulating body reciprocally movable totally within confines of cantilever support over a predetermined distance along only said rail portions and having a plunger means and lamp socket integral therewith to have a combined width permitting insertion thereof as pre-assembled from one side of the panel, said plunger means having a location at least in part in between said rail portions laterally thereof, and a pair of electrical terminals mounted in said socket and including extensions beyond said socket for electrical circuit energization, said guide means alone remaining in a fixed mounting position though said body including plunger means, socket and terminal means can be reciprocally moved.

6. The structure of claim 5 wherein each of said terminal means has a substantially U-shaped contact engageable directly to a lamp bulb having wiring bent over one side of a web-like glass base of the bulb fitted to project substantially transversely to said axially extending rail portions.

7. The structure of claim 5 wherein each of said terminal means has a substantially U-shaped contact inside said socket and includes extensions projecting to a location outside the socket and adapted to be used in electrical energization, said extensions having positions longitudinally spaced in opposite directions and substantially parallel to said axially extending rail portions, said socket having a position axially in alignment with said plunger means, said guide means alone remaining in a fixed mounting position though said body including plunger means, socket and terminal means can be moved to and fro.

8. In a combined switch and lamp-retainer assembly including a body portion with socket-like lamp-retainer means and plunger means integrally of insulating material having resilient bias thereon for normal positioning thereof in one direction though adapted to fit through a mounting aperture of a panel on one side of a compartment subject to closure by a cover, door and the like, the improvement which comprises a wire-like guide means having a substantially closed-loop configuration including one end that forms a limit stop for movement of said body portion in one direction as kept within confines of said guide means also having a pair of bar-like parallel and laterally spaced side rails along which said body portion is slidably traversible and complementary, and a centrally apertured plug-like mounting button peripherally engageable per se in the mounting aperture, said guide means at an end opposite said limit stop having cantilever support by way of said mounting button rather than directly to the panel.

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