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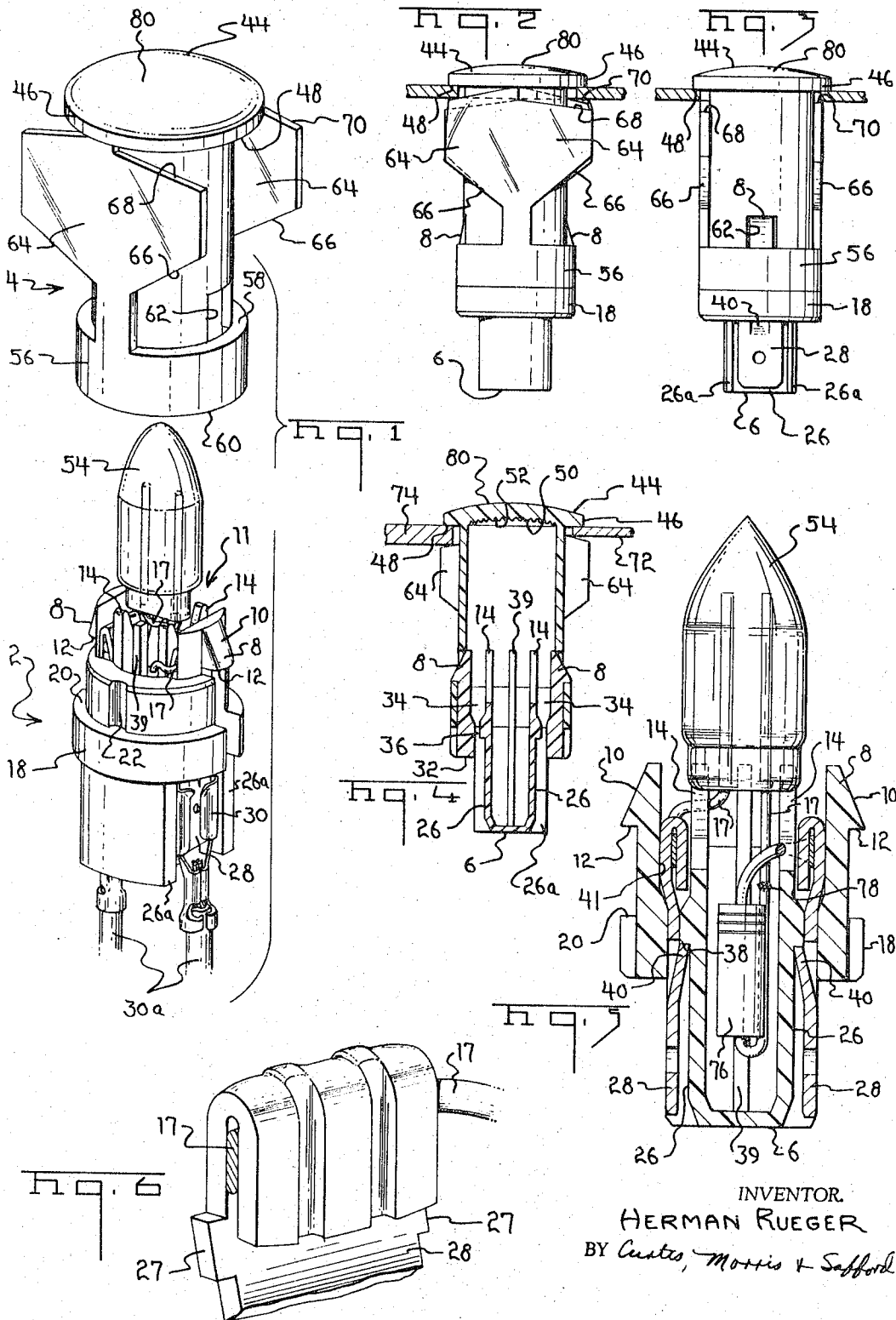
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HOUSING WITH INTEGRAL LOCKING FINS AND A FLANGE

FOR MOUNTING IN A PANEL APERTURE

Original Filed July 19, 1962

2 Sheets-Sheet 1



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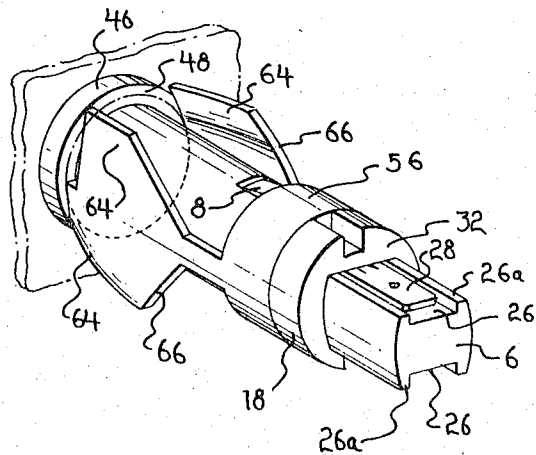
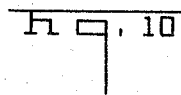
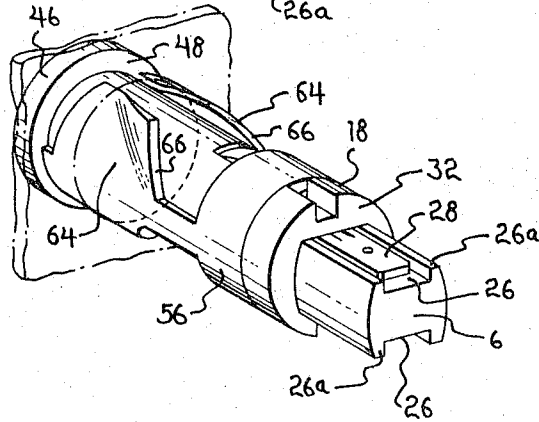
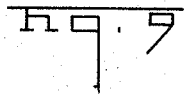
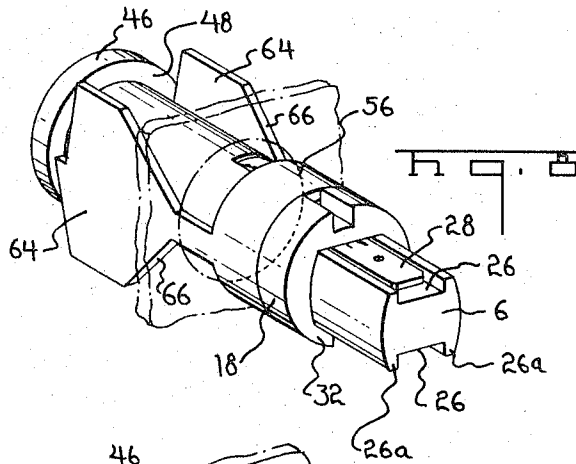
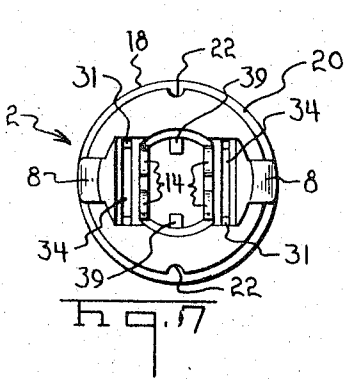
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2 Sheets-Sheet 2



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HOUSING WITH INTEGRAL LOCKING FINS AND A FLANGE FOR MOUNTING IN A PANEL APERTURE

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Original application July 19, 1962, Ser. No. 210,950, now Patent No. 3,217,319, dated Nov. 9, 1965. Divided and this application Sept. 9, 1965, Ser. No. 486,185

8 Claims. (Cl. 174-58)

ABSTRACT OF THE DISCLOSURE

A housing for containing electrical components and for mounting in an aperture of a panel which comprises a tubular member in which the electrical components are to be disposed, a flange member at one end of the tubular member for engagement with one side of the panel, and integral locking fin members extending substantially tangentially from the tubular member and having edges opposed to and axially spaced from the flange member, the fin members being stiffly flexible so as to be bendable toward the tubular member when the tubular member is being inserted in the aperture and move outwardly from the tubular member so that the edges of the fin members move into engagement with the other side of the panel thereby securing the tubular member in position.

This application is a division of application, Ser. No. 210,950, filed July 19, 1962, now Patent No. 3,217,319.

This invention relates to signal devices and more particularly to panel mounted pilot or indicator lights of the type used, for example, in appliances such as electric stoves and the like.

It is among the objects of the present invention to provide an improved signal device which may easily be secured within an opening in the front of a supporting panel by merely pushing the device into the opening, and, while not accidentally dislodgable from the panel, yet may be withdrawn simply when the occasion so demands.

Another object is the provision of a signal device with integral locking elements so designed as to lock the device firmly into place in any of a number of panel thicknesses within a predetermined range, its flexible locking elements being arranged so as to self-adjust to the particular panel thickness.

Another object is to provide a new and improved signal device which is small in size and therefore requires a minimum of panel mounting area, but when mounted in close proximity to other similar lights, gives a clear indication from all viewing angles.

Another object is that of providing a signal device in which the connection between the leads of the lamp and the lamp terminals is reliable, yet made with simple application tools and inexpensive parts.

A further object is to provide a new and improved signal device made of a translucent material which can be easily molded or otherwise formed preferably with an integral section for dispersing the light rays given off by the lamp.

Another objective is that of providing a new and improved signal device inexpensively fabricated from plastic which will be expendable in use.

These and other objects of this invention will become apparent when the description is read in conjunction with the accompanying drawings wherein:

FIGURE 1 is an exploded perspective view of an embodiment of a panel light in accordance with the present invention;

FIGURE 2 is a front elevational view of the assembled panel light on reduced scale;

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FIGURE 3 is a side elevational view generally similar to FIGURE 2;

FIGURE 4 is a cross-sectional view taken axially through the assembled housing;

FIGURE 5 is an enlarged cross-sectional view taken axially through the base with the lamp components in assembled position;

FIGURE 6 is an enlarged fragmentary perspective view showing the connection between a lead of the lamp and its associated terminal;

FIGURE 7 is a top plan view of the base portion of the housing;

FIGURE 8 is a perspective view showing the panel light partially inserted into an opening in a panel;

FIGURE 9 is a perspective view showing the panel light in a half-way inserted position with respect to the panel; and

FIGURE 10 is a perspective view showing the panel light fully inserted and locked into position in a hole in the panel.

Referring to the drawings, the indicator light includes a base 2 and cap 4. The base which is hollow and tubular shaped is molded from suitable plastic insulating material. One end of the base is closed by an integral head 6, whereas the other end is open and adapted to receive the lamp components. Near the open end and on the outer periphery of the base 2 are two laterally opposed latching elements 8 which protrude longitudinally from the open end with their tips extending laterally therefrom. Latching elements 8 latch into place in holes in the cap (as described hereinafter) to hold the base 2 and cap 4 together. The outer surface of each latching element 8 is longitudinally tapered as at 10 so as to form rearwardly disposed transverse surfaces 12 to lock into slots provided in the cap, and prevent the base 2 and cap 4 from separating after assembly.

Extending forwardly from the open end 11 to a region of access, and integrally formed with the inside surface of the base 2, are a number of laterally opposed elongated support members 14, around which the wires 17 of the lamp components are looped, FIGURE 1, thus supporting the lamp and holding it in axial alignment on base 2. The support members 14 provide a cradle in the central section of the base, FIGURE 7, to receive the generally oblong lower end of the lamp and to assist in maintaining wires 17 in spaced relation.

Around the outer periphery of the base, near its central portion, is a circumferential ridge 18, its forwardly directed face 20 bottoms against the cap 4 and acts as a stop to limit longitudinal movement of the base 2 and cap 4 during assembly.

On the outer surface of the base are two longitudinal grooves 22 which run from the forwardly directed face 20 of circumferential ridge 18 to the open end 11. These grooves 22 meet and receive two integral keys on the cap, the purpose of which is to align the base 2 and cap 4 relative to each other when they are assembled.

The closed integral head 6 of the base 2 is generally I shaped in cross-sectional area, as can be seen in FIGURES 8, 9, and 10, so as to provide channels 26 with upstanding edges 26a. This integral head 6 extends rearwardly from the rearwardly directed face 32 of the circumferential ridge 18.

To provide for connection of the indicator lamp to external circuitry, the lead wires of the lamp components are connected to a pair of contact blades 28 which are mounted in the base, preferably in a snap-fit, to extend along channels 26 between edges 26a.

One end of the contact blade 28, preferably a sheet metal stamping, is folded back on itself onto the wire conductor 17, FIGURE 6, and corrugated inclusive of the bight of the fold, by a suitable crimping tool. This

results in cold forging the contact blade 28 to the wire conductor 17 into a substantially solid mass, thereby producing a good mechanical and electrical connection.

Spring clip terminals 30, of which there are many known in the art, serve to couple external lead wires 30a to blades 28, and advantageously are guided into coupling relation with the blades by channels 26.

Passageways 34, FIGURE 4 and FIGURE 7, extend between rearward face 32 and end 11 of the base, as can be seen particularly in FIGURE 4. These passageways 34 are provided with a reduced internal section 36. When the contact blade 28 is inserted into the base through open end 11, the blade passes through section 36, and when the blade is fully inserted, spring member 40 of the blade 28 snaps into place behind rearwardly disposed face 38. Passageways 34 have an enlarged section 41 with forward sloping edges to provide a lead in for the contact blades. The crimped or folded-over section of the contact blades 28, which is now doubled in thickness, is slidably received in enlarged section 41. The contact blades have two laterally opposed protruding members 27 which abut ridge 31 in the base, FIGURE 7, to prevent the contact blade from being over-inserted into passageways 34. This arrangement locks and holds the contact blades into place in the base and prevents longitudinal movement of the blades relative to the base 2.

The base 2 which is tubular in shape, and hollow, has an open end 11 into which the lamp components are fitted. In the particular embodiment shown and described herein these lamp components include a neon lamp 54, therefore a resistor 76 is needed to reduce the line voltage to the low value at which neon lamps are typically rated. One lead wire from the lamp 54 is crimped or squeezed between two bent over surfaces of a blade contact 28, as can be seen in FIGURE 6; the other wire from the lamp is welded or otherwise connected as at 78 to one lead wire of resistor 76. The other lead wire of the resistor is crimped to the second terminal in the same manner as explained above, thus resulting in the component parts connected in series. The terminals 28 are then inserted into passageways 34 to lie along channels 26 with the lamp cradled in support members 14 and the wires looped around members 14 as best shown in FIGURES 1 and 5. In this connection electrical spacing of the wires within base 2 may be assured by a pair of diametrically opposed longitudinal ribs 39 on the inside walls of base 2. Disposing resistor 76 between ribs 39, spaced approximately the diameter of the resistor, stops a lead wire positioned along one side of the resistor body from movement into unwanted contact with the lead wire on the other side.

The cap 4 is also hollow and tubular shaped with one end open so as to receive the base, and the other end closed by an integral head 44. The head 44 has a circumferential flange 46 with a flat surface 48 disposed toward the open end which abuts the panel and acts as a stop to limit longitudinal movement when the assembled device is installed on a panel. The inner transverse surface 50 of the head 44 is provided with either circular or transverse grooves 52, FIGURE 4, and the outer surface 80 is dome shaped and polished. This arrangement disperses the light rays given off when the lamp 54 is illuminated.

Near the open end of the cap 4 is a circumferential ridge 56 which has a rearwardly directed face 58 and a forwardly directed face 60. Face 60 of the cap abuts face 20 of the base when the device is assembled to prevent over-insertion of the base into the cap. Directly behind face 58 are two laterally opposed, rectangular openings 62 into which latching elements 8 spring outwardly. Subsequently, rearwardly disposed surfaces 12 of the latching elements lock behind surfaces 58 of the cap and prevent the base and cap from being pulled apart longitudinally.

On the outer surface of the cap 4 near the closed end

are two laterally opposed fin-shaped locking members 64 which in the present embodiment are tangentially molded integral with the body of the cap. Locking members 64, however, may extend from the cap at any angle which will cause them to bend in a wrap around fashion as the cap is pushed through a hole in a panel. These locking members hold the assembled device into a suitable hole in a panel. The fin-like members 64 are thin and flexible and their leading edges 66 are inclined backwardly in a delta fashion thus providing an easy-entry means so that when the assembled device is pushed into a hole in a panel, the fins will fold inwardly and wrap around the periphery of the cap, FIGURE 9. The rearwardly disposed edges 68 and 70 of the fin members 64 are inclined at a reverse angle (relative to the leading edges 66) with one of the edges of each fin member being axially disposed forwardly of the other. Edges 68 are positioned diametrically opposite whereas edges 70 are positioned the same way. Thus, there are always at least two diametrically opposite edges locked in behind the panel so as to prevent the device from cocking in the panel. This is done so that one device can be used with a number of different panel sizes, as indicated schematically at 72 and 74 in FIGURE 4. The reverse angle on edges 68 and 70 allows the fins to adjust themselves to the particular panel thickness used. For example, for a thin panel, edges 68 may snap all the way back to their original position, whereas edges 70 may snap back only to the point where their surfaces touch the edge of the hole in the panel, as particularly shown in FIGURE 10.

Even where the panel is thicker than the maximum spacing between surface 48 and edges 68 and 70, fins 64 will still afford sufficient retention for some conditions of use. Note in FIGURE 9, for example, that the distal or lower portions of the fins have sprung outwardly even though edges 68 and 70 are still confined by the sidewalls of the panel aperture, and the spring of these portions resists any effort to back the device out of the aperture. A more secure lock of the device in thicker panels may be provided, if desired, by forming downwardly extending slots in the side edges of the fins which release their lower portions for independent spring action and abutment with the panel.

It will therefore be understood that a new and improved panel light has been provided which may be easily assembled as it is only necessary to stake the wires from the lamp and resistor to each other or to the terminals, whichever the case may be, and insert the subassembled parts into place. Also it will be noted that the terminals are simple in form, and may easily be fabricated by stamping them from sheet metal of electrical conductive material such as brass.

It will also be seen that a new improved panel light has been provided which may be easily secured into a hole in a panel, and which will lock firmly into place over a wide range of panel thicknesses.

It will therefore be appreciated that the aforementioned and other desirable objects have been achieved; however, it should be emphasized that the particular embodiment of the invention, which is shown and described herein, is intended as merely illustrative and not as restrictive of the invention.

What is claimed is:

1. A housing for containing electrical components and for mounting in an aperture of a thin panel comprising a tubular member for receiving said electrical components, flange means proximate one end of said tubular member for engaging one side of the panel, and locking fin members extending substantially tangentially from said tubular member and having edges opposed to and axially spaced from said flange means to engage the other side of said panel to cooperate with said flange means to maintain the tubular member in said aperture, said locking fin members being flexible to close peripherally upon said tubular member to pass therewith through said

aperture and thereafter to move outwardly from said tubular member into engagement with the other side of said panel.

2. A housing according to claim 1 wherein said locking fin members comprise a pair of thin fins on opposite sides of the tubular member, the edges of each thin fin having different axial spacings relative to said flange means to mount said tubular member in panels of various thicknesses.

3. A housing for containing electrical components mountable in an aperture of a panel member comprising a dielectric tubular member for receiving said electrical components, an integral flange member at one end of said tubular member engageable with one side of said panel member, stiffly flexible integral fin-like members extending substantially tangentially outwardly from said tubular member, and edges on said fin-like members opposed to and axially spaced from said flange member engageable with the other side of said panel member to cooperate with said flange member to maintain the tubular member in said aperture, said fin-like members being bendable toward said tubular member when said tubular member is being inserted in said aperture and move outwardly from said tubular member into engagement with the other side of said panel member.

4. A housing according to claim 3 wherein said fin-like members include a pair of fin-like members on opposite sides of the tubular member, said edges of each of said fin-like members being opposite said flange member and each of said fin-like members including an additional edge remote from said flange member, the additional edges being inclined toward free ends of said fin-like members.

5. A housing according to claim 4 wherein said edges opposite said flange member have different axial spacing relative to said flange member to mount said tubular member in panel members of various thicknesses.

6. A fastening device for a member of the type installable in an aperture in a panel comprising a body member having integral fin-like members and a flange member, said fin-like members being stiffly flexible, extending tangentially outwardly from said body member and having leading inclined edges to aid the insertion of said body member within said aperture and trailing

oppositely-inclined edges engageable with one side of said panel, said fin-like members being moved toward said body during insertion thereof within said aperture and moving back toward their normal position with the trailing oppositely-inclined edges being engageable with the one side of said panel, said flange member being spaced from said fin-like members and engageable with the other side of said panel.

7. A fastening device according to claim 6 wherein the oppositely-inclined edges have different axial spacings relative to said flange member so that said body member can be mounted in panels of various thicknesses.

8. In a device mountable in a panel opening, a body member having a configuration mateable with said panel opening, an integral flange member at one end of said body member, an integral fin-like members projecting tangentially from said body member and being axially spaced from said flange member, said flange member and said fin-like members defining a holding means with said flange member being disposed adjacent one surface of said panel opening and said fin-like members engaging another surface thereof when said body member is mounted within said panel opening, said fin-like members being provided with leading edges permitting easy installation of said body member within said panel opening and trailing edges permitting the body member to be mounted on a number of panel thicknesses in such a manner that the fin-like members will move toward their original position thereby locking the housing in said panel opening by at least two of said fin-like members.

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