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[54] **ILLUMINATED ELECTRICAL DEVICE**
9 Claims, 6 Drawing Figs.
[52] U.S. CL..... **240/2,**
240/2SP
[51] Int. CL..... **F21v 33/00**
[50] Field of Search..... **240/2,**
2 (S), 2 (SP), 2.25, 73; 339/(Inquired)

ABSTRACT: An electrical device with dual receptacles and an exposed electroluminescent panel between the receptacles for illumination.

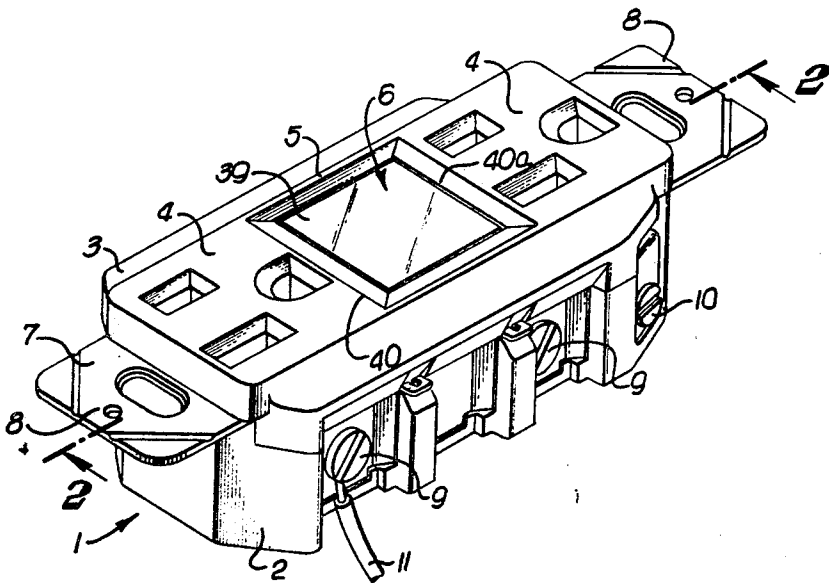


FIG. 1.

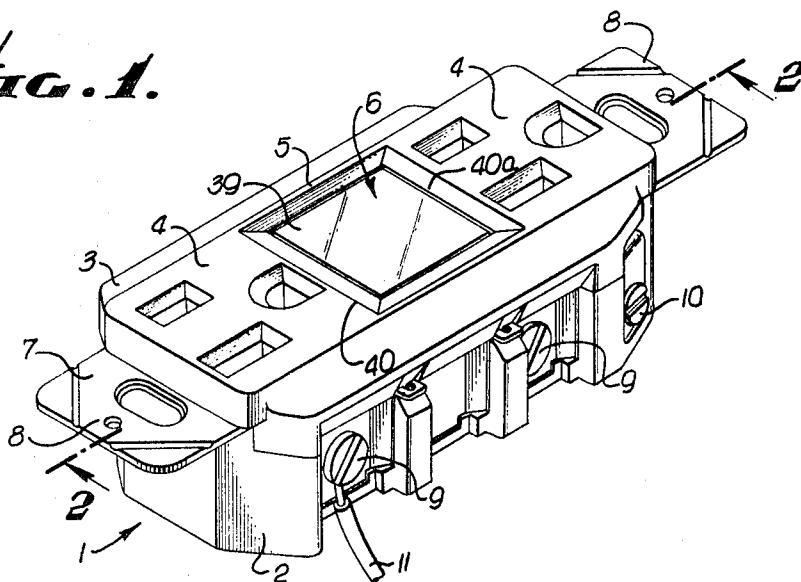


FIG. 2.

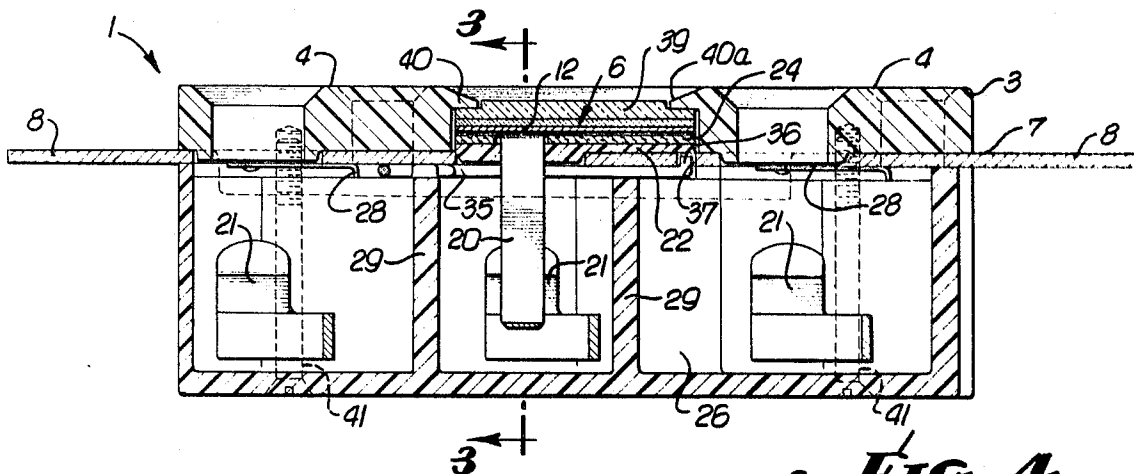


FIG. 3.

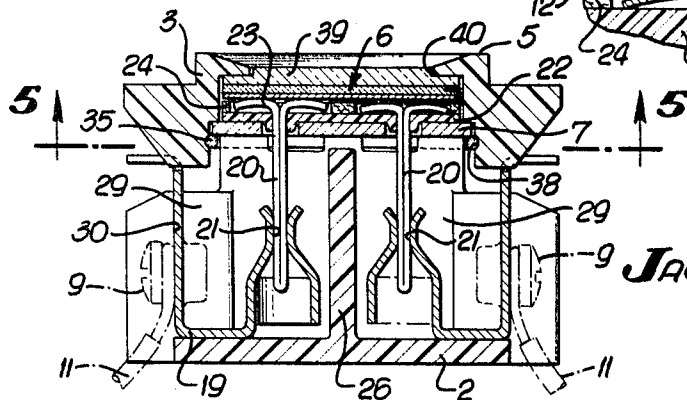
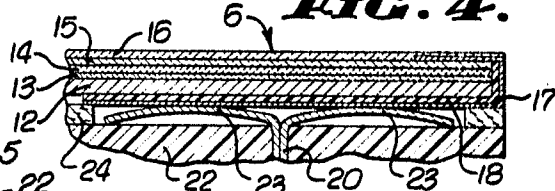


FIG. 4.



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FIG. 6.

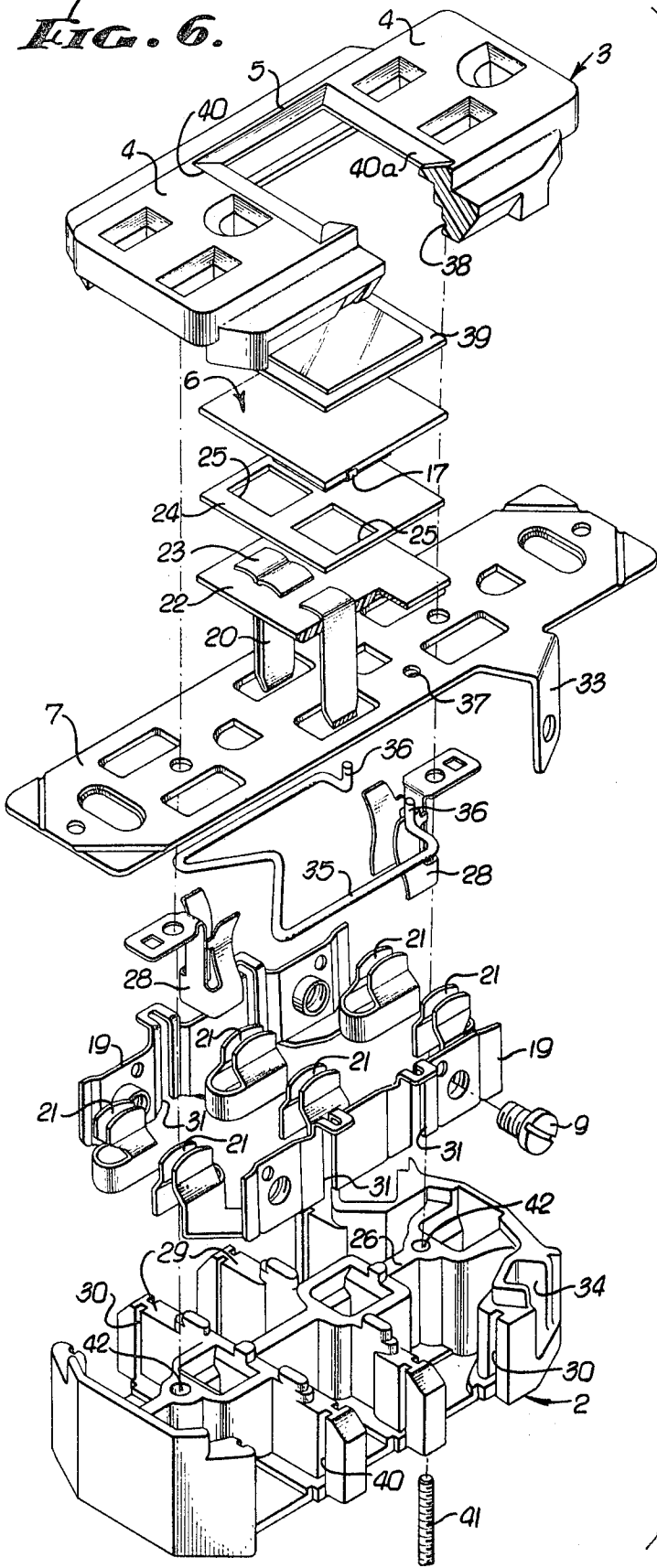
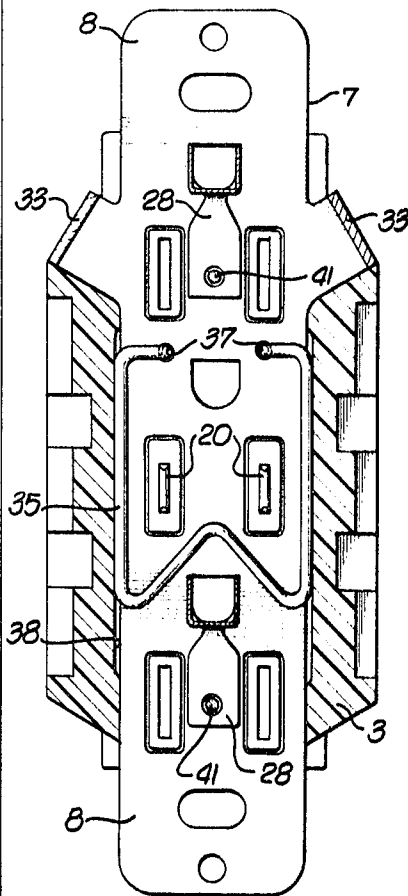


FIG. 5.



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ILLUMINATED ELECTRICAL DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention has to do with improved electrical devices and particularly with electrical devices which provide illumination to darkened places. The present devices are duplex receptacles having spaced dual receptacle stages for insertion of conventional grounded or ungrounded plugs. In its particular aspects, the invention is concerned with obtaining more attractive and more effective continuous low level illumination from a duplex receptacle device.

2. Prior Art

Illuminated receptacles, switches and other electrical devices have in the past been achieved generally by the attachment of an illumination source to a conventionally designed device. Thus, in U.S. Pat. No. 3,056,897 to Knochel et al. an electroluminous panel and in U.S. Pat. No. 3,061,716 to Benander, a three-way plug having an electroluminescent face are described to be attachable to a conventional duplex outlet for illuminating purposes. Others have disclosed luminous faceplates designed to fit over a conventional electrical device such as a switch or receptacle, e.g. U.S. Pat. No. 3,307,030 to de Francisco.

In these patents and typically in the past illumination has been dependent on addition of a separable illuminating element to a conventional outlet or switch. As such, these elements may project from a baseboard and thus be subjected to inadvertent dislodgement or even breakage. In areas of the home frequented by children, where continuous illumination is often desirable, separable illuminating elements may well be a hazardous "attractive nuisance."

SUMMARY OF THE INVENTION

Accordingly it is a major objective of the present invention to provide illumination from a luminous element within a duplex receptacle device.

With this objective in view, the invention generally contemplates an electrical device providing illumination and comprising a body containing electrical receptacle stages spaced beyond an area of the body between them and an exposed electroluminescent panel in the defined area. Typically, the receptacle stage apertures and electroluminescent panel are coplanar and flush with the body face or the panel is relatively recessed. Panel and receptacle stages are electrically connected to a common contact. For this purpose, the device body may be provided with an elongated bussing strip or contact which carries along its length a central set of blade receiving means for connection with electrically connective blades carried by the electroluminescent panel, and, spaced on either side thereof, additional blade receiving sets for electrical connection to plug blades inserted into said receptacles. A correspondingly elongated body cover section may be provided centrally apertured and with cooperating frame means formed therein, to form the body face for reception and retention in the cover section of a congruent electroluminescent panel and a lens sized to cover the panel, the frame means serving to prevent passage of the panel outwardly completely through the section aperture.

In a specific embodiment the illumination providing electrical receptacle includes an elongated body comprising a case section and a cover section, a multiple stage bussing strip mounted in the case section and strap means typically secured between the case and cover sections for mounting the receptacle. The cover section has dual pairs of plug-blade receiving slots spaced therealong and opposite the contact. Between the slot pairs the cover section is centrally rectangularly apertured to accommodate therewithin an inserted multilayer electroluminescent panel assembly secured between the strap and panel-retaining framing around the central aperture.

The invention will be further described as to a specific illustrative embodiment thereof in conjunction with the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a duplex receptacle having an integral electroluminescent panel, according to the invention;

FIG. 2 is a longitudinal sectional view of the receptacle taken along line 2-2 in FIG. 1;

FIG. 3 is a transverse sectional view thereof taken along line 3-3 in FIG. 2;

FIG. 4 is a fragmentary view, in section, of the electroluminescent panel showing the top connector arrangement;

FIG. 5 is a horizontal view of the receptacle, partly in section, taken along line 5-5 in FIG. 3; and

FIG. 6 is an exploded view thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIG. 1 of the drawings, an electrical device is shown comprising an elongated nonconductive two-piece body 1 having a case section 2 and a cover section 3, a pair of receptacle stages spaced beyond an apertured area of the body, indicated at 5, between the receptacle apertures 4 in the cover section and an electroluminescent panel 6 accommodated by the body in the area 5. The cover section 3 is appropriately apertured at 5 to receive the panel 6 within the cover section, flush or recessed with respect to the receptacle apertures 4. Mounting strap 7 extends through the body 1 longitudinally and projects from either end thereof to provide ears 8, for supporting the body in a wall box (not shown). Terminals 9 and ground screw 10 provide connection to current supply leads 11 and ground respectively, as is conventional in duplex grounded receptacle devices.

The present device provides continuous, low level illumination by the accommodation of the electroluminescent panel 6 between the spaced duplex receptacle apertures 4 and centrally within the body cover section 3. As is known, electroluminescent panels are multilayer assemblies having opposed planar electrodes across a dielectric e.g. ceramic material in which excitable phosphors are distributed so that application of an AC voltage to the electrodes produces a luminous glow. The structure of a particular electroluminescent panel is shown in FIG. 4 to comprise a metal plate electrode 12, a ceramic coating 13 thereon, a phosphor-containing ceramic layer 14, a light transmitting electrode 15 and a transparent finish coat 16. Such structures are prepared by applying and firing ceramic coating 13 to the base metal plate electrode 12, applying the ceramic coating 14, in which is suspended special phosphors which on excitation by an alternating electric field generate light; applying the electrically conductive, yet transparent coating 15 such as vapor deposited aluminum, and sealing the transparent electrode layer with a finish coat 16 of suitable glaze material. Connector clip 17 is secured to the edge of panel 6, insulated by nonconductive patch 18 from base plate electrode 12 and in electrical contact with the light transmitting electrode 15.

As most clearly shown in FIGS. 2 and 3, electrical connection to the electrodes 12 and 15 is through contact of these electrodes separately to the parallel ground or positive contacts 19, illustratively by means of contact blades 20 which extend between the panel and contact slots 21. Contact blades 20 are held rigid and in engaged relation with the electrode 12 and connector clip 17 by insulative divider 22 through which the folded-over blades 20 extend. The upper ends 23 of the blades, through the divider 22 are folded outward to engage the upper surface of the divider and to provide a broad contact area for the electrode 12 and connector clip 17. A nonconductive spacer 24 with cutouts 25 is sandwiched between the divider 22 and the panel 6 with the cutouts located over the blade ends 23 (FIG. 4) to enable planar alignment of the divider and the panel with the blade ends in contact with the panel. In the illustrated embodiment, the panel 6, divider 22 and spacer 24 are rectangular, but the specific configuration of these members is not limited to any particular form.

The various parts of the present receptacle-illumination device are most clearly shown in FIG. 6. The body case section 2 is a one-piece molding of insulative material configured

as a conventional triplex receptacle case. As such, the case 2 has a longitudinal central rib 26 enlarged at spaced points to form apertures 27 for receiving the grounding prong receptacle 28 for connection to ground. Laterally projecting from the central rib 26 of the case section 2 are transverse ribs 29 which are vertically grooved as at 30 for receiving the edges of notches 31 in contacts 19 thus to securely mount the contacts in the case section. The contacts 19 are elongated bussing strips shaped for interfitting with the case section 2. Notches 31 spaced intermediate the ends of the contacts 19 are sized to fit closely over ribs 29 of the case section 2, specifically along the grooves 30 formed in the ribs. The contacts 19 carry three sets of opposed contact slots 21; the two end sets are adapted to receive plug blades (not shown) inserted through cover section apertures 4 of the receptacle stages. The center set of contact slots 21 identical to the end sets lies opposite the panel contact blades 20 and thus may serve for electrically connected to the electroluminescent panel 6. Thus contacts 19 are connected to or common to all sets of blade receiving contact slots 21, whereby illumination of the panel 6 is realized by connecting the receptacle device body 1 to a current supply.

In assembling the device, the contacts 19 are mounted in the body case section 2 by interfitting the notches 31 and grooves 30, with the contact slots 21 facing inward and opposite one another to form sets. Grounding prong receivers 28 are inserted in apertures 27 adjacent the end sets of contact slots 21. Mounting strap 7 is fitted in place with grounding screw tab 33 in recess 34 of the case section 2 and with strap ears 8 projecting beyond the ends of body 1. Between the mounting strap 7 and the case section 2, a U-shaped spring fastener 35 is positioned with right-angled end portions 36 inserted through openings 37 in the mounting strap. The spring fastener 35 is dimensioned, as shown in FIG. 5, to project slightly outward beyond the intermediate edge margin of mounting strap 7. In FIG. 6, it will be seen that cover section 3 has a spring retaining groove 38 formed therein to be entered by the spring fastener 35 when the cover section is in proper position relative to the case section 2.

The electroluminescent panel assembly, including panel 6 with connector clip 17 secured thereto, divider 22 with associated contact blades 20, spacer 24 and a transparent cover or lens 39 are coaxially aligned centrally of the cover section 2 and inserted prior to fitting the cover section 3 so that panel blade ends 23 are in electrical contact with the panel electrodes 12 and 15. The cover section 3 is provided with a frame 40 around the central aperture area 5, formed with inwardly beveled edges 40a which project into the aperture to retain the panel assembly within the cover section. The cover section 3 and case section 2 are then pressed together until spring fastener 35 enters and seats in groove 38, to detachably hold the cover section and case section of the body 1 together. Screws 41 are inserted through case openings 42 and seated in cover section 3. When thus assembled, the contact blades 20 are engaged with contact slots 21 and upon appropriate connection to a current supply, the electroluminescent panel 6 glows, providing illumination. The electroluminescent panel it will be noted is flush with the face of the receptacle device or

recessed therein and thus is not subject to dislodgement or mechanical abuse and is safe against disassembly by children.

I claim:

1. An illuminated electrical device comprising a nonconductive body containing electrical receptacles with spaced receptacle apertures in the face of the body, an exposed electroluminescent panel in the area of the said body face between the receptacle apertures and essentially coplanar therewith arranged to illuminate only said area, a lens sized to cover said electroluminescent panel, said receptacles being openly accessible outside the electroluminescent panel.

2. Illuminated electrical device according to claim 1 in which said receptacles and electroluminescent panel are electrically connected to a common contact.

3. Illuminated electrical device according to claim 1 in which said body includes a cover section defining the body face and said receptacle apertures, frame means being formed in said cover section outwardly of said panel lens and including also electrical contact means within the body providing electrical connection to said receptacles and said panel.

4. Illuminated electrical device according to claim 3 in which said electroluminescent panel carries electrically connective blades and said contact has blade receiving means arranged for connection with said panel blades.

5. Illuminated electrical device according to claim 4 in which said contact is elongated and carries along its length plural sets of blade receiving means including a central set for connection with said panel blades and on either side thereof additional sets for electrical connection to contact blades passing through said receptacle apertures.

6. Illuminated electrical device comprising an elongated nonconductive body having a case section containing spaced electrical receptacles, and a cover section provided with blade passing apertures opposite said receptacles, an area of the body cover section centrally between the blade passing apertures, being apertured, and an electroluminescent panel accommodated within said cover section in exposed relation between said receptacle apertures to illuminate only said area, a lens sized to cover said electroluminescent panel within said cover section and frame means formed in the cover section to prevent passage of the panel lens outwardly through the cover section aperture said receptacles being openly accessible outside said electroluminescent panel.

7. Illuminated electrical device according to claim 6 including also an electrical contact mounted in said case section and strap means fastened to the body for mounting said device.

8. Illuminated electrical device according to claim 7 in which said strap means is secured between the case section and the cover section of the body and including also fastening means underlying said panel for detachably holding the cover section to the case.

9. Illuminated electrical receptacle according to claim 8, in which said cover section aperturing includes panel-retaining framing, and said electroluminescent panel comprises a multilayer assembly secured between said framing and said strap means.