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L. M. SHELDON
INTERCHANGEABLE WIRING DEVICE WITH
PRESSURE LOCK TERMINALS
Filed April 28, 1958

2,946,977

FIG. 1.

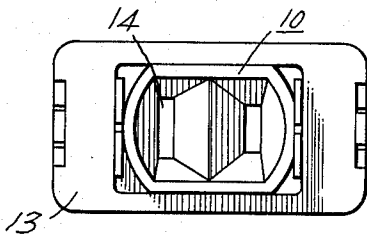


FIG. 2.

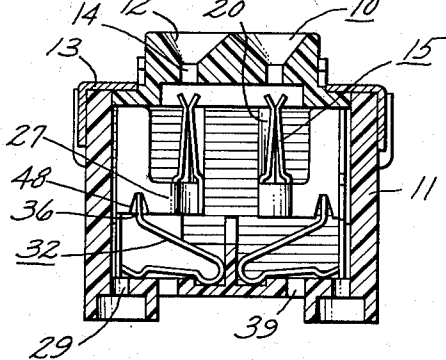


FIG. 3.

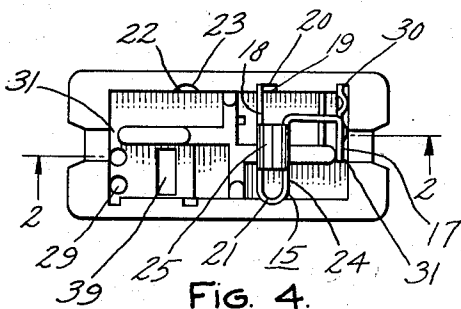


FIG. 4.

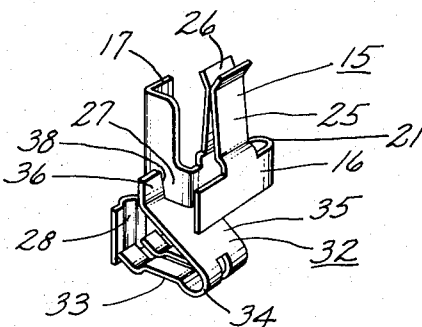
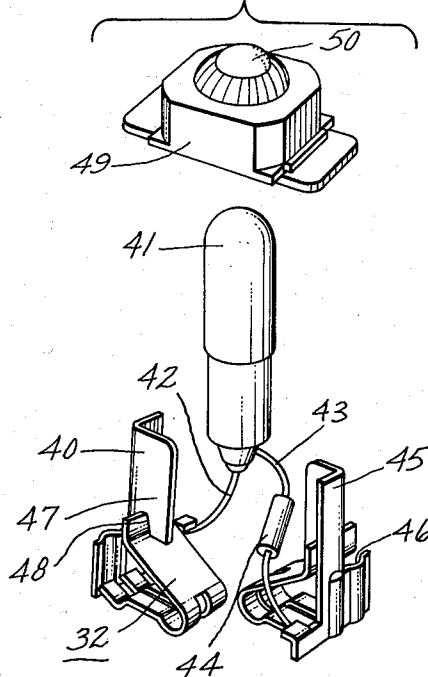


FIG. 5.



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INTERCHANGEABLE WIRING DEVICE WITH
PRESSURE LOCK TERMINALSLuther M. Sheldon, Oak Lawn, R.I., assignor to General
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3 Claims. (Cl. 339-95)

The present invention relates to electrical wiring devices and particularly to such devices of reduced size where as many as three devices may be assembled on a single mounting bracket. A line of such devices would include a convenience outlet, a pilot light and a toggle switch. The present invention is primarily related to the single convenience outlet and the pilot light and to a novel method of anchoring the spring locking tongues in the devices so as to afford pressure-lock terminals in place of the conventional screw terminals.

The present invention is an improvement over the pressure-lock terminal invention of the Benander Patent No. 2,705,785, which is assigned to the same assignee as is the present invention, and it is likewise related to a copending Benander application Serial No. 568,853, now Patent No. 2,841,673. In the Benander patent the pressure-lock terminals were designed for conventional wiring devices such as duplex convenience outlets, toggle switches and screwshell lampholders. In an interchangeable type of wiring device each device is of minimum size so that as many as three devices may be supported from a mounting strap in a single gang box in the place usually occupied by a single wiring device of conventional design. Hence, the space factor in the design of such interchangeable wiring devices is of utmost importance. In actual practice there are three interchangeable wiring devices, namely, a toggle switch, a single convenience outlet and a pilot light. It is expedient that all three of these devices be of substantially the same over-all size so that their appearance will be complementary and similar elements in each device may be standardized to reduce the tooling cost.

The principal object of the present invention is to provide an electrical wiring device with a novel fulcrum means for the anchoring portion of a spring locking tongue that affords a pressure-lock terminal for the device.

A further object of this invention is to provide a novel contact structure for a single convenience outlet of an interchangeable type where the contact members are suspended from the opposite side walls of the housing.

The preferred embodiments of the present invention include a hollow housing with an open top wall that is closed by a detachable cover member. In the convenience outlet the cover includes a pair of prong-receiving openings for receiving the parallel prongs of an attachment plug. Within the housing there are two contact members having portions positioned under the prong-receiving openings for making electrical engagement with the attachment plug. Each contact member has a terminal end supported edgewise on the bottom wall of the housing and against one end wall. The terminal end of each contact member has an extension that connects with a U-shaped spring section. This spring section is suspended between opposed side walls of the housing, and at least one leg of the U-shaped section includes an upright blade for making electrical engagement with the prong of an attachment plug. The bottom wall of the housing in-

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cludes at least one wire-receiving opening where one side edge of each opening is substantially in alignment with the inner surface of the terminal end of the contact. Each contact member has associated therewith a spring locking tongue with a wire-gripping portion and an end that is doubled back at a re-entrant angle and is braced against a partition in the housing. From the re-entrant end there is a movable offset arm that terminates in an upright anchoring portion. The said extension of the contact member has a V notch formed in its lower edge to serve as a fulcrum for the upright anchoring portion of the spring locking tongue.

My invention will be better understood from the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

Figure 1 is a top plan view of a single convenience outlet embodying my invention.

Figure 2 is a cross-sectional, elevational view of the outlet of Figure 1 taken on a longitudinal line of the housing as shown at line 2-2 of Figure 3.

Figure 3 is a top plan view of the recessed base of the outlet of Figure 1 with the mounting plate and cover member removed and showing only the right-hand contact member in place.

Figure 4 is an isometric view showing one contact member for the outlet of Figure 3 and the fulcrum arrangement between the contact member and the anchoring portion of a spring locking tongue.

Figure 5 is an exploded view showing elements of a pilot light which may be assembled in the same recessed base of the convenience outlet of Figure 1.

Referring in detail to the drawing and in particular to Figures 1 and 2, there is shown a single convenience outlet 10 comprising a hollow housing of suitable insulating material formed by a recessed base member 11 and a top cover 12. A small portion of the cover 12 is recessed within the open top of the base 11, and a thin metal mounting plate 13 is assembled over the cover and formed down at the ends of the base to engage abutments extending from the end wall to complete the assembly of the housing. The detachable cover 12 is provided with a pair of parallel openings 14 that are adapted to receive the parallel prongs of an attachment plug that is to be inserted into the outlet. Attention is drawn to the compact size of this outlet and the fact that it is almost as deep as it is long from end to end, and that its width is only slightly greater than the width of the attachment prongs that would be inserted into the outlet.

The outlet contains two similar contact members 15 for connecting the two prongs of an attachment plug with two wires that carry electrical current from the power source. Each contact 15 is stamped from thin sheet brass stock and then folded into the intricate shape best illustrated in Figures 2, 3 and 4. Each contact 15 has a horizontal generally U-shaped spring portion 16 and a vertical terminal end 17 that rests on the bottom wall and is adapted to be positioned against the inner surface of one end wall of the base 11. The spring portion 16 is positioned in the top half of the base 11 and is suspended horizontally between the two opposed side walls, as best seen in Figure 3. One leg 18 of the U-shape extends beyond the other leg and is seated on a ledge 19 that is at the bottom of a vertical slot 20 formed in this side wall. The rounded base 21 of the U-shape is seated on a complementary ledge 22 that constitutes the bottom of a vertical slot 23. The long leg 18 of the spring portion 16 and a short leg 24 each support an upright blade 25. These blades converge upwardly toward each other and have a diverging tip 26 for guiding the prong of an attachment plug after it is

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inserted through the openings 14 in the cover of the housing. These blades 25 are normally spaced close together and they must be separated in order to insert the attachment prong between them. In so doing, the legs of the spring portion 16 are likewise sprung apart which, of course, increases the spring resistance to the insertion of the blade and gives a good double wiping action against the sides of each attachment prong. There is a right angular extension 27 that connects the short leg 24 of the spring portion 16 with the terminal end 17. This terminal end is seated on the bottom wall of the base, as seen in Figure 2, and extends upwardly to be in engagement with the underside of the cover 12. The lower end of the terminal 17 is wider than the upper end and it includes two vertical grooves 28 of such size as to receive two bare wires that are to be inserted through openings 29 in the bottom wall of the base. The side edges of the lower end of the terminal end 17 are confined within vertical slots 30 and 31 in the base and the terminal end 17 of the contact is held down by the cover.

Provision must be made for mechanically and electrically connecting the lead wires to the lower ends of the terminal ends 17 of the contacts. This is accomplished by using pressure-lock terminals of the type pioneered in the Benander Patent No. 2,705,785. A spring locking tongue 32 is associated with each contact 15 and occupies the lower portion of the base, while the main portion of the contacts 15 occupy the top half of the base. The spring locking tongues 32 are seated on the bottom wall of the housing and each tongue member has double wire-gripping fingers 33 with their free ends overlying the wire-receiving opening 29 in the bottom wall of the base. The opposite end of the wire-gripping fingers are formed at a re-entrant angle as at 34 and extend upwardly as a movable offset arm 35 that terminates in an upright anchoring lip 36. As best seen in Figures 2 and 4, the lower edge of the extension 27 of the contact is formed with a tapered or trapezoidal slot 38 in which the anchoring lip 36 is confined for limited sliding movement. This over-sized tapered slot 38 serves as a fulcrum for the anchoring lip 36 and allows for slight variations in the length or over-all size of the spring locking tongue. If the slot 38 were narrow and closely engaged the lip 36, assembly difficulties would undoubtedly occur. The offset arm 35 would become rigid and serve to wedge the related contact against the end wall of the base. Depending on the amount of oversize of the locking tongue, it might be impossible to force the contacts down so that the cover could be installed. The wires are released by inserting a suitable tool through an access opening 39 in the base to deflect the spring fingers away from the wire, as will be well understood by those skilled in this art.

The exploded view of Figure 5 shows the various parts of a pilot light for use in an interchangeable line of wiring devices to complement the convenience outlet 10 in Figure 1. These elements of Figure 5 are designed to fit into the recessed base 11 shown in Figure 2. First, the spring locking tongues 32 are identical with those illustrated in Figure 4 as being incorporated in the convenience outlet 10. The contact members 40 for the pilot light are different from the contact members 15 of the outlet since there is no necessity for providing spring blades such as blades 25 for engagement with the prongs of an attachment plug. Instead of this, a neon glow lamp 41 is provided with bare lead wires 42 and 43 for connecting the lamp across the two contact members 40. A current limiting resistor 44 is incorporated with the lead wire 43 as a necessary adjunct to a neon glow lamp. Each contact member 40 has a terminal end 45 that would be vertically disposed within the base 11 against one end wall and has a lower portion with grooves 46 that receive the bare ends of the wires from the power source. Also, each contact 40 has an exten-

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sion 47 similar to extension 27 of the contact 15 described with relation to Figure 4. This extension also has a tapered slot 48 on its lower edge for receiving the upright anchoring lip 36 of the spring locking tongue 32. The lead wires 42 and 43 are soldered or otherwise fastened to the contact members 40 and then the contacts are slipped into the base 11 and a cover member 49 replaces the cover 12 of the single convenience outlet of Figure 2. This cover 49 includes a translucent jewel 50 which allows the lamp 41 to be observed at a distance when it is illuminated.

Having described above my invention of a novel wiring device of the interchangeable type, it will be readily apparent to those skilled in this art that I have designed devices of minimum size with pressure-lock terminals that are completely enclosed within the housings, and with a novel cooperation between the spring locking tongues and the contact members of both the single convenience outlet and the pilot light. The contact members are firmly fastened within the housings and they serve to anchor the spring locking tongues in place.

Modifications of this invention will occur to those skilled in this art and it is to be understood, therefore, that this invention is not limited to the particular embodiments disclosed but that it is intended to cover all modifications which are within the true spirit and scope of this invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A convenience outlet comprising a hollow housing, a pair of contact members in the upper portion of the housing, each contact having a spring portion and a terminal end, the spring portion being of generally U-shape with one leg of the U supported at one end on a ledge on a side wall of the housing, while the base of the U is supported on another ledge on the opposite side wall, at least one upright blade extending from a leg of the U for making electrical engagement with a prong of an attachment plug, and a pair of prong-receiving openings in the top of the housing centered over the said blades, the second leg of the U having an extension that is directed toward an end wall of the housing with the terminal end positioned against the end wall and supported by the bottom wall, and spring locking tongues seated on the bottom wall of the housing, each tongue member having a wire-gripping portion and an end that is doubled back at a re-entrant angle and terminates as a movable offset arm with an upright anchoring portion, the said extension of the U-shaped spring portion having an oversized slot on its lower edge to serve as a fulcrum for the anchoring portion of a locking tongue, and at least one wire-receiving opening through the bottom wall of the housing associated with the terminal end of each contact, one side edge of each opening being substantially in alignment with the terminal end of the related contact, so that a wire may be brought into the housing through said opening and electrically connected to the contact terminal by the wedging action of a spring locking tongue.

2. A wiring device comprising a hollow housing, electrical contact members supported against opposite walls of the housing, each contact member having an extension that extends away from the contact member at a perpendicular angle, and at least one wire-receiving opening through the bottom wall of the housing and associated with each contact member, one side edge of each opening being substantially in alignment with the inner surface of the terminal end of the contact, and a spring locking tongue for each contact member seated on the bottom wall of the housing, each tongue member having a wire-gripping portion and an end that is doubled back at a re-entrant angle and terminates as a movable offset arm with an upright anchoring portion, the said extension of each contact member having an oversized tapered slot on its lower edge to serve as a fulcrum for the anchoring portion of a locking tongue.

3. A convenience outlet comprising a hollow housing formed by a recessed base member and a detachable top cover that is fastened to the base member, a pair of prong-receiving openings in the cover centered over a pair of contact members, each contact member having a terminal end braced against an end wall of the base member and seated on the bottom wall in edgewise fashion, and a perpendicular extension from the terminal end of the contact that is directed toward the interior of the base member, and a U-shaped spring section of the contact suspended between the opposite side walls of the base member, said U-shape section having two legs, each leg including an upright blade for making electrical contact with the opposite sides of a prong of an attachment plug, and at least one wire-receiving opening in the bottom wall of the base, one side edge of this opening being substantially in alignment with the inner surface of the terminal end of one

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contact, and a spring locking tongue seated on the bottom wall of the base member and having a wire-gripping portion and an end that is doubled back at a re-entrant angle and terminates in a movable offset arm with an upright anchoring portion, the lower edge of the said extension of each contact having an oversized wide-angle slot serving as a fulcrum for the upright anchoring portion of a spring locking tongue.

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