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Oct. 12, 1943.

J. E. BUTLER

2,331,654

ELECTRICAL OUTLET

Filed May 26, 1941

NO

FIG. 1.

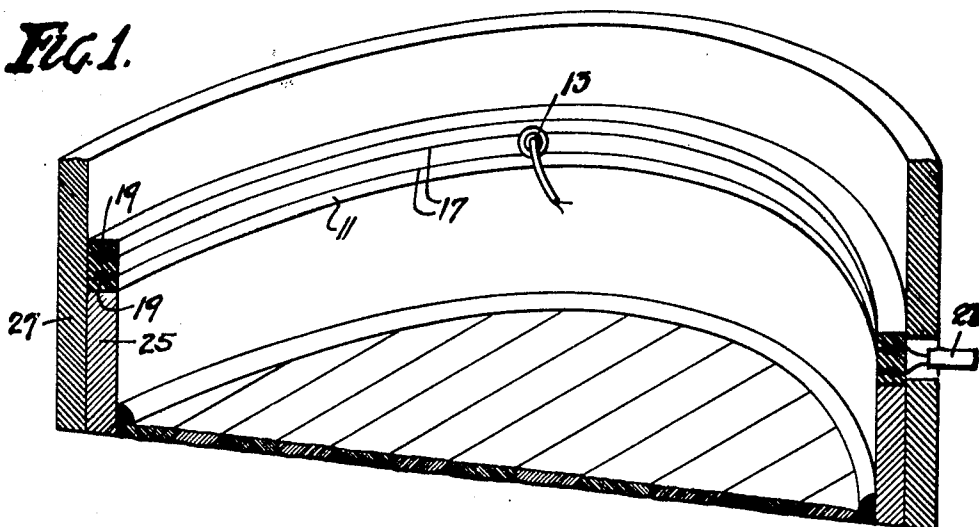


FIG. 2.

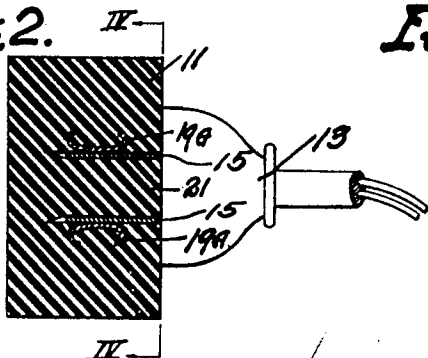


FIG. 4.

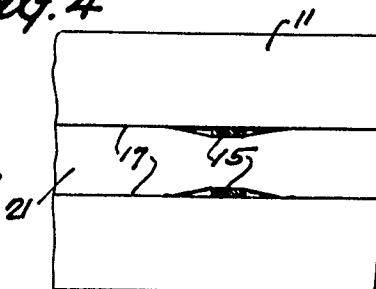


FIG. 3.

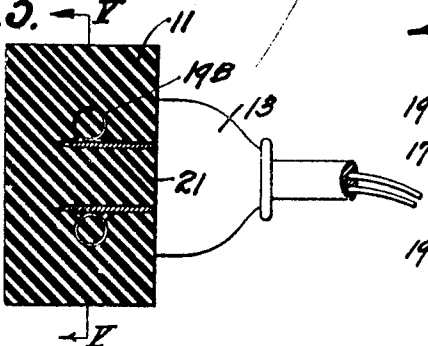
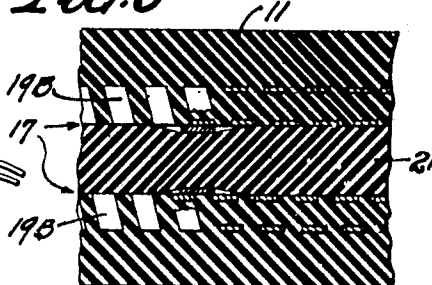


FIG. 5.



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UNITED STATES PATENT OFFICE

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ELECTRICAL OUTLET

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Application May 26, 1941, Serial No. 395,174

2 Claims. (Cl. 173—334.1)

This invention relates to certain new and useful improvements in elongated or continuous electrical sockets adapted for plug insertion at any chosen spot, and particularly to a flexible type of such continuous socket adapted for attachment as to curved or irregular wall surfaces, and also adapted for use as a cable to which plug attachment may be made at any desired place or places throughout its length and yet which may be handled with impunity.

It further relates to the construction of the socket and particularly to the means for securing therein the bus bar terminals of an electric circuit.

Elongated sockets have previously been well known, but such sockets have been made in general, and it is believed entirely, of inherently rigid material which have been channeled out to receive bus bars and slotted to permit access to the bus bars. The bus bars in and of themselves have been made resilient so that they may be laterally displaced to permit entrance of the plug fingers and accomplish definite contact therewith. In general they have however been made or held or both so that even had the enclosing insulation been flexible, bending of the socket is substantially resisted if not prevented by the bus bars themselves.

Recognition has also been had of the inherent danger of the open slots and lip or flap members have heretofore been associated with the rigid structures to effect slot closure, these flaps being displaceable by the plug fingers to permit entrance of such fingers.

The principal object of this invention is, therefore, to provide an elongated electrical socket of inherently flexible material having normally self-closed slits adapted to receive plug terminals of flexible bus bar type imbedded in said socket adjacent and forming a portion at least of one side of each of the slots, the bars being adapted to be flexed with flexing of the socket.

A further object is to provide means for securing continuous flexible bus bar terminals in a flexible elongated electric socket, adapted to permit flexing of said bus bars without damage to said socket.

A further object is to provide an elongated electric socket in which the openings for receiving plug terminals are restricted relative to the thickness of said plug terminals and are distortable by said plug terminals to permit plug insertion.

A further object is to provide an elongated electric socket in which the bus bar terminals are secured contiguous to the plug receiving slots.

The means by which the foregoing and other objects of the invention are accomplished and the manner of their accomplishment will be readily understood from the following specification on reference to the accompanying drawing, in which:

Fig. 1 is a perspective view, partly in section, of a portion of a wall and baseboard of a building with the improved elongated socket in position.

Fig. 2 is a sectional view of one form of the improved socket and bus bars with the plug in place.

Fig. 3 is a similar view of an alternate form of the socket and bus bars, also with the plug in place.

Fig. 4 is a face view of a fragmentary portion of the socket member with plug inserted and cut away as on the line IV—IV of Fig. 2; and

Fig. 5 a sectional view taken as on the line V—V of Fig. 3.

Referring now to the drawing in which the various parts are indicated by numerals:

11 is an elongated socket member of elastic insulating material as soft rubber, here shown as rectangular in cross section, but which when used as a cable per se may be round or of other shape as desired, and 13 a cooperative plug of standard type having the usual pair of flat fingers 15 spaced apart and commonly used in establishing push in electrical connection with the ordinary socket.

The member has two parallel slits or cuts 17 spaced to conform with the spacing of the plug fingers 15, and of depth slightly greater than the length of the fingers. The slits preferably extend continuously substantially throughout the length of the member, though obviously they may be briefly interrupted from time to time, particularly in the case of the cable type member, where there may be tendency of the slits to gape apart as under abrupt curvature and they preferably do not in such case extend fully to the cable ends for the same reason. Embedded in the member material are two bus bars 19 which lie along the two slits 15 with a portion of the face of each exposed in its slit for electrical contact with the fingers. Preferably these bus bars to insure maximum available insulating and isolation at all times lie on the relatively remote sides of the slits so that the tongue 21 of insulation, undisturbed by deformation of the bars under bending, lies at all times between the two bars.

The bus bars 19 are preferably of arcuate cross section, such for instance as the substantially C

shape bars 19—A, shown in Figs. 1 and 2, or the spiral type bar 19—B, shown in Figs. 3 and 5, and are intimately imbedded in and adhered to the material of the member 11.

Either of these types permits bending of the member 11 in any direction, the C obviously flattening about one axis at right angles and the embedding and supporting material conformingly distorting to permit such flattening. Should the curvature of the bar be abrupt as a right angled bend connection obviously might not be and probably would not be possible at such bend, but few if any conditions can be visualized where this would be of importance. 23 is a circuit connection to the bus bar.

In using the device in a permanent installation the member 11 is placed as along the baseboard 25 of a room and against the wall 27 and being flexible may be conformed to the curvature, as of the arcuate recess shown in Fig. 1, or around convexly curved surfaces (not shown) as well as along the usual straight walls. In room corners the member may be abruptly bent at ninety degrees, in such case the bus bar usually being permanently kinked, though not necessarily so, and obviously no connection being possible immediately in the corner.

The device is also clearly indicated for use as an unattached cable which may be laid out in and around machinery installations or the like and permit the plugging in of inspection lights, thus permitting the shift of these lights from place to place as conditions may require for inspection of the various parts of the machines. Such cable installations may be temporary or permanent as may be desired.

In using the device the fingers 15 of the plug are merely forced into the slits 17 displacing the sides of these slits, this displacement being shown in Fig. 4 as entirely accomplished by distortion of the material of the tongue 21, but usually the distortion being substantially equal of the tongue material and the material lying outside the slits on opposite sides of the tongue. Displacement of the sides of the slits, however, permits the fingers of the plug to reach and contact the bus bars in usual manner, and on the removal of the plug the slits reclose and protect the bus bars against accidental contact.

I claim:

1. An electrical outlet device, adapted to be

used with an electrical plug having a pair of contact fingers, said device comprising an elongated member of flexible insulating material, as soft rubber, said member having normally closed slits substantially conforming in spacing to said fingers and extending inwardly from one of said faces, each said slit being locally distortable by insertion of a said finger; and a pair of electrical conductors, extended substantially throughout the length of said member, each comprising a flexible tape-like member coiled to form a flexible helix having broad contact surfaces, said resilient material filling the interior of each said helix and extending through spaces between the coils thereof, and surrounding the major portion of the outer surface thereof to secure each said conductor in position and prevent lateral displacement thereof, said contact surfaces of each said conductor lying contiguous to a said inwardly extended slit, and being locally exposed for contact by slit distortion, upon finger insertion.

2. An electrical outlet device, adapted to be used with an electrical plug having a pair of flat contact fingers, said device comprising an elongated member of flexible insulating material, as soft rubber, inherently transversely bendable and locally distortable, said member having normally closed slits, substantially conforming in spacing to said fingers and extending inwardly from one of said faces, each said slit being locally distortable by insertion of a said finger; and a pair of electrical conductors, extended substantially throughout the length of said member, each comprising a flexible tape-like member coiled to form a flexible helix having broad contact surfaces, spaced apart less than the width of a said finger, said resilient material filling the interior of each said helix and extending through spaces between the coils thereof, and surrounding the major portion of the outer surface thereof to secure each said conductor in position and prevent lateral displacement thereof, said contact surfaces comprising relatively minor sections of the outer surface of each said helix, said contact surfaces of each said conductor lying contiguous to a said inwardly extended slit, and being locally exposed for contact by slit distortion, upon finger insertion.

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