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P. M. HALL

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HOUSING FOR ELECTRICAL APPARATUS

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FIG. 1.

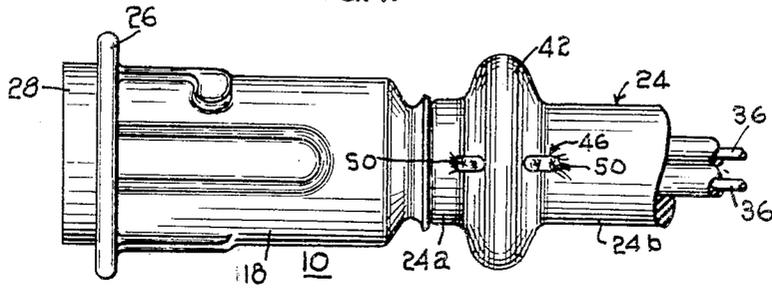


FIG. 2.

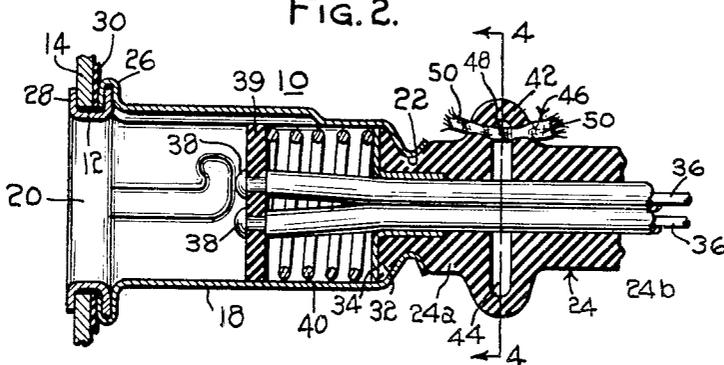


FIG. 3.

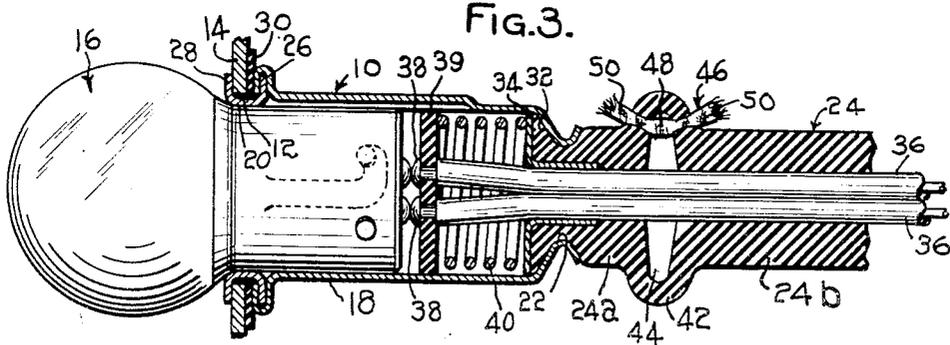
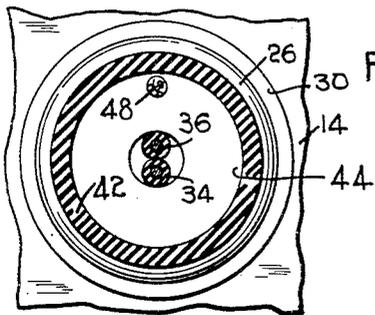


FIG. 4.



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## HOUSING FOR ELECTRICAL APPARATUS

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4 Claims. (Cl. 339—101)

This invention relates generally to housings for electrical apparatus and the like, and has particular reference to a housing for lamps, switches, and the like for automobiles and similar structures where a moisture resistant assembly is desirable.

Such housings, for example lamp sockets, are commonly formed of sheet metal, and have a front aperture for receiving a lamp bulb, and a rear aperture into which a tubing formed of rubber or other resilient material is assembled to carry electrical lead wires to the lamp bulb connections. Although the tube is assembled into the rear of the housing so as to be as water resistant as possible, and the front end of the housing is assembled onto the support by means of gaskets or similar sealing means, it has been found impossible to seal the assembly so completely that no moisture enters the housing.

The object of the invention is to provide a housing for electrical apparatus in which means is provided for transferring moisture from the interior of the housing to the exterior thereof.

A still further object of the invention is to provide a housing for electrical apparatus in which a resilient tubular member for carrying lead wires to the apparatus is provided with wick means for transferring moisture from the interior of the tubing to the exterior thereof.

Other objects of the invention will, in part, be obvious, and will, in part, appear hereinafter.

In the drawing:

Fig. 1 is a view in elevation of a lamp socket embodying the features of the invention;

Fig. 2 is a view in section of the socket and hose assembly of Fig. 1;

Fig. 3 is a view in section of the lamp socket of Fig. 2 with a lamp bulb assembled therewith; and

Fig. 4 is a view in section taken on line 4—4 of Fig. 2.

Referring to the drawing, there is illustrated a lamp socket assembly 10, which is adapted to be assembled into an opening 12 in a panel 14, which may be a portion of an automobile or the like, to receive a lamp bulb 16.

The assembly 10 comprises generally a socket body 18 having an opening 20 at one end to receive the bulb, and an opening 22 at the other end to receive a resilient tubular member 24. To allow assembly of the body 18 onto the panel, a peripheral flange 26 and a protruding retaining ring 28 is provided about the opening 20, so that the retaining ring may be inserted through the panel opening 12 and curled outwardly to retain the body in assembly in the opening. To provide a water resistant seal between the socket body and the panel, a washer 30 of rubber or other suitable sealing material may be provided between the flange 26 and the panel.

The tubular member 24 is assembled into the opening 22 in any convenient manner, and in the illustrated embodiment is provided with an outwardly flared end portion 32 which is retained against the end of the socket body about the opening 22 by a flanged eyelet 34, thereby providing a water resistant seal.

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The tube 24 is ordinarily made sufficiently long to enclose the wires up to a point where they enter a protected portion of the automobile body, at which point a rubber boot (not shown) may be assembled over the tube and the wires. The boot may be provided with openings of suitable size to tightly enclose the individual wires to prevent moisture from entering the end of the tube.

To complete an electric circuit to the lamp bulb, a pair of lead wires 36 are disposed in the tube and extend into the housing, terminating in a pair of contacts 38 disposed in suitable spaced openings in an insulating washer 39. To insure a good electrical connection between the bulb and the contacts, a spring 40 is provided between the washer and the adjacent end of the socket, so that when the bulb is assembled into the socket, the contacts move rearwardly compressing the spring (see Fig. 3).

The rearward movement of the contacts during assembly of the bulb requires that the lead wires also move longitudinally in the tube 24, and since the lead wires are in frictional engagement with the sides of the tube, it would require considerable force to move the entire length of the wires longitudinally in the tube.

To avoid this difficulty, a bellows formed by a radially extending U-shaped portion 42 is provided about the periphery of the tube a short distance from the socket body, forming an internal circumferential groove 44 inside the tube. By the provision of the bellows, when the wires need move during assembly of a bulb into the socket, they need move through only the relatively short portion 24a of the tube between the bellows and the socket body, since the portion 24b of the tube on the side of the bellows opposite the socket body can move with the wires by reason of the longitudinal flexibility of the bellows.

Although the seals at the socket and the ends of the tubes are made as tight as possible, it has been found impossible to make them absolutely air tight, and hence during temperature changes, expansion and contraction of the air in the housing causes a certain amount of air to pass into and out of the housing. A certain amount of moisture is thereby carried into the housing, and moisture may also be present in the air in the housing when the device is assembled; hence, a subsequent drop of temperature will cause this moisture to condense inside the housing.

For this reason a wick 46 is provided in the tube, which extends through the bellows longitudinally of the tube, so that a medial portion 48 is disposed inside the tube and the ends 50 of the wick are disposed outside the tube on opposite sides of the bellows. The wick is formed of fibrous material capable of transferring moisture, such as cotton twine. The moisture inside the tube is absorbed by the medial portion 48 of the wick, and travels along the wick through the walls of the bellows to evaporate from the ends 50.

Although under conditions of high humidity or extreme moisture outside the tube, a certain amount of moisture can also pass into the tube, this has not been found to be troublesome for a number of reasons. As soon as a condition of extreme moisture outside the tube terminates, the wick transfers any moisture inside the tube back outside, and the ability of the wick to transfer moisture from the inside to the outside is considerably greater than its ability to transfer moisture in the reverse direction, by reason of the greater exposed wick area on the outside of the tube, and the greater circulation of air about the outside of the tube to evaporate the moisture from the ends thereof.

By the assembly of the wick longitudinally through the bellows, the medial portion 48 of the wick is dis-

posed in the internal groove 44 and is thereby not affected by movement of the wires 36 in the tube.

The device of the invention provides a simple and economical method of maintaining the interior of electrical housings in a substantially moisture-free condition. Its use is not limited to lamp sockets, but is also adapted for use with other electrical apparatus such as switches, fuse housings, relays, and the like.

Since certain other obvious changes may be made in the device without departing from the scope of the invention, it is intended that all matter contained herein be interpreted in an illustrative and not in a limiting sense.

I claim:

1. A moisture resistant assembly for containing electrical apparatus, said assembly comprising a housing, a resilient tubular member having one end connected to the housing and extending therefrom to carry electrical lead wires to the housing, a radially extending portion on the tubular member forming an internal cavity in the wall of the tube, and a moisture transferring member extending through the radially extending portion so as to have a medial portion disposed inside the tube and end portions projecting from both sides of the radially extending portion outside the tube to transfer moisture from the interior of the tube to the exterior thereof.

2. A moisture resistant assembly for containing electrical apparatus, comprising a housing, a resilient tubular member connected to the housing and extending therefrom to receive electrical lead wires, said tubular member having a radially extending peripheral portion which is generally U-shaped in cross section forming an internal

peripheral groove inside the tube, and a moisture transferring wick member extending longitudinally of the housing through the U-shaped radially extending peripheral portion so that a medial portion of the wick member is disposed inside the tubular member and the ends thereof are disposed on opposite sides of the radially extending peripheral portion.

3. A resilient tubular member for carrying electrical lead wires to electrical apparatus, said tubular member having a radially extending portion forming an internal recess, and a moisture transferring wick member extending through the radially extending portion so that a medial portion of the wick is disposed inside the tubular member and the end portions thereof are disposed outside the tubular member on opposite sides of the radially extending portion, said end portions having a greater exposed surface area than said medial portions.

4. A resilient tubular member for carrying electrical lead wires to electrical apparatus, said tubular member having a bellows portion forming an internal peripheral recess and a wick member extending through the bellows portion longitudinally of the tube so as to have a medial portion disposed inside the tube and a pair of end portions disposed outside the tube on opposite sides of the bellows portion, said end portions having a greater exposed surface area than said medial portions.

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