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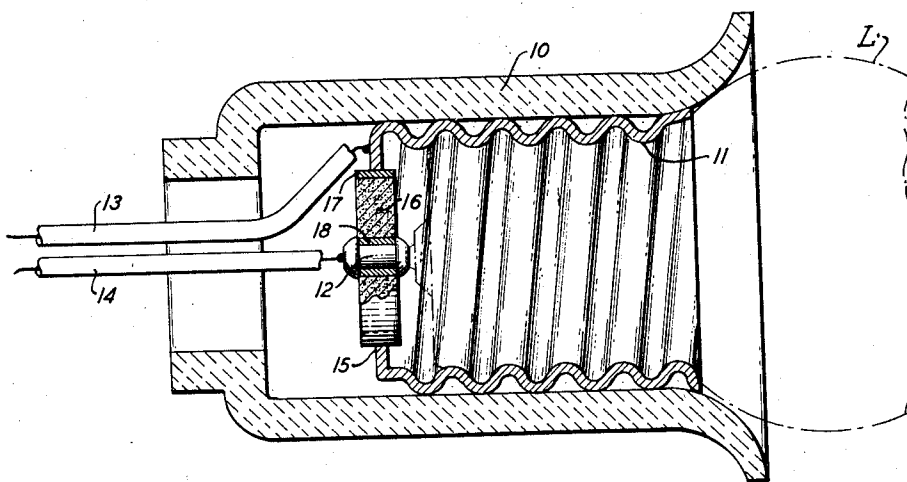
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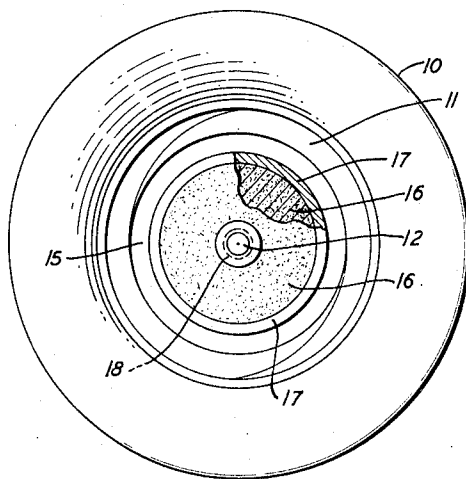
LAMP SOCKET FOR SERIES LIGHTING CIRCUITS

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**FIG.1.**



**FIG. 2.**



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## LAMP SOCKET FOR SERIES LIGHTING CIRCUITS

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3 Claims. (Cl. 201-49)

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This invention relates to lamp sockets and more particularly to sockets for use in series-lighting circuits.

The object of this invention is to automatically shunt an inoperative series-connected lamp on the failure of said lamp.

Heretofore numerous means have been suggested and employed to maintain the operation of a series-lighting circuit, notwithstanding a failure of one or more of the lamps. Broadly classed, these means have included mechanical shunts both automatically and manually operated, and electrical shunts operated by the rupturing of an insulating film, by placing a high resistance across the lower resistance of the filament, or by connecting a semiconductor having a negative temperature coefficient of resistance across the lamp.

In accordance with this invention an improved structure is provided for shunting a series-connected lamp which has failed by utilizing a material having a negative temperature coefficient of resistance and associating it with a shell for a socket in a manner such that a very satisfactory lamp socket is realized which is compact, simple and easily manufactured.

More particularly this invention comprises a lamp socket for a series-lighting circuit, for example, a series-lighting circuit for a Christmas tree, having a centrally apertured disc of material having a negative coefficient of resistance secured in the bottom of the shell forming a mechanical support for the lamp. The central contact of the lamp passes through a central aperture in the disc thereby permanently shunting the disc across the lamp filament.

The various features of this invention will be better understood from the following detailed description when considered in conjunction with the accompanying drawings in which:

Fig. 1 discloses in the main a sectional view of a socket illustrative of one embodiment of this invention, and

Fig. 2 is a detailed plan view of the socket of Fig. 1.

The drawings show a lamp socket of the conventional type having an outer casing 10 of insulating material in which a threaded shell contact 11 containing a central contact 12 is suitably secured. Leads 13 and 14 are connected to the shell contact 11 and the central contact 12, respectively, to complete the circuit from the source through the leads 13 and 14, the contacts 11 and 12 and a lamp L mounted in the socket. Secured within the bottom of the shell contact 11 in a

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suitable manner, such as by spinning or crimping in its lower edge 15 is a centrally apertured disc 16 of a material having a high negative temperature coefficient of resistance. A suitable material for this disc is that disclosed in Patent 2,258,646 to Grisdale of October 14, 1941. This disc 16 structurally replaces the fiber or ceramic insulating disc which is usually mounted in the shell contact of an ordinary socket to support the central contact, and simultaneously provides a shunt between the shell contact 11 and the central contact 12 across the filament of the lamp. In order to insure adequate electrical contacts having constant resistances between the shell contact 11 and the disc 16 and between the central contact 12 and the disc 16 the outer and inner peripheries have coverings or electrodes 17 and 18 (shown with an exaggerated thickness for purposes of clarity) deposited thereon, thus providing metal-to-metal contacts between these members.

This socket may be employed in a series circuit, for example, a Christmas tree lighting circuit having a plurality of lamps. When connected in a circuit of this nature with an operative lamp secured in the socket, the resistance of the material of the disc 16 is such that the resistance between the contact 11 and the contact 12 across the disc is, relative to the lamp filament, effectively an open circuit, and the disc performs only the mechanical function of supporting the central contact 12. However on rupture of the circuit through the lamp an increased electromotive force is impressed across the disc causing an increase in the normally minute current flowing therethrough. The increased current flow increases the rate of heat generation within the disc such that it is greater than the heat dissipated and thus the thermal unbalance causes an increase in the temperature and a corresponding decrease of the resistance of the disc to a point limited by the resistance of the circuit where the resistance of the disc again stabilizes. This second stable resistance value is approximately equal to the resistance of the parallel lamp and disc which it has replaced, thus restoring the normal operation of the remainder of the circuit, the value being determined in the well-known manner by the selection of a material having the desired negative temperature coefficient of resistance and a structure having the desired thermal, electrical and mechanical characteristics.

As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is

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to be understood that all matter hereinbefore set forth, or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A lamp socket comprising an electrically conductive shell having two open ends, the opening in one of said ends being smaller than the opening in the other of said ends, a disc of resistance material having a negative temperature coefficient of resistance inalterably secured in the smaller opening of said shell, said disc having an aperture at its center, a contact in said aperture, and separate metallic coatings on the aperture wall and periphery of said disc and engaging said contact and said shell respectively.

2. A lamp socket comprising a metallic shell having an electrically conductive, annular, inwardly extending flange, a disc of resistance material having a high negative temperature coefficient fitted within the aperture in said flange and permanently joined to said flange, said disc being electrically connected to said flange, an electrical contact supported by said disc in spaced relation to said shell, and leading-in conductors fixedly and directly connected to said shell and said contact.

3. A lamp socket comprising a metallic shell,

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a contact member spaced from said shell, a shunt connected between said shell and said contact, said shunt comprising a disc of material having a high negative temperature coefficient of resistance permanently secured in an end of said shell and supporting said contact member in spaced relationship to said shell, separate metallic coatings on said disc engaging said contact and said shell respectively, and a pair of leading-in conductors for supplying energy to said socket, one conductor being connected to said shell and the other conductor being fixedly and directly connected to said contact member.

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