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H. H. HELMBRIGHT
ELECTRIC INCANDESCENT LAMP

2,272,520

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Fig. 1

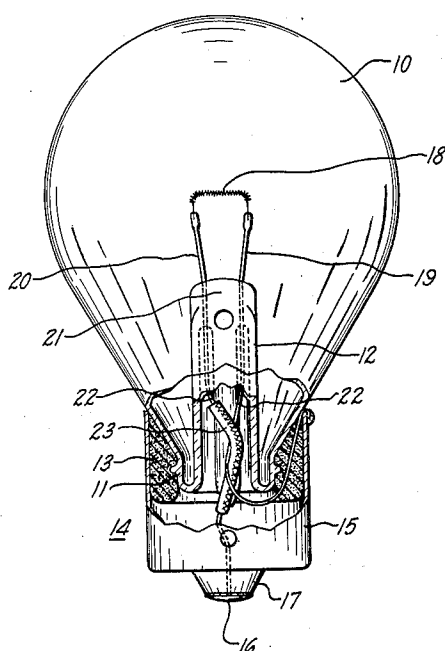
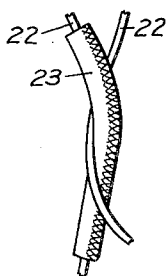


Fig. 2



Inventor:
Henry H. Helmbright,
by *John H. Anderson*
His Attorney.

UNITED STATES PATENT OFFICE

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ELECTRIC INCANDESCENT LAMP

Henry H. Helmbright, Cleveland Heights, Ohio,
assignor to General Electric Company, a cor-
poration of New York

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4 Claims. (Cl. 176—38)

My invention relates in general to electric incandescent lamps and similar devices comprising a sealed bulb or envelope containing an electric energy translation element or filament. More particularly, my invention relates to a by-pass arrangement for protecting the filament of such devices against rupture by high voltage electrical discharges.

In certain applications, such as in railway and other signals, the electric incandescent lamps employed therein are frequently subjected to external electrical discharges of high voltage, such as lightning and static electricity. Such excessive electrical discharges are very apt to rupture the lamp filament, thereby rendering the signal inoperative and creating a dangerous traffic condition.

One object of my invention is to provide an electric incandescent lamp with a protective arrangement for the filament thereof to prevent its disruption when the lamp is subjected to external high voltage electrical discharges.

Another object of my invention is to provide an electric incandescent lamp the leading-in wires of which are formed with closely arranged portions which will by-pass any high voltage discharge to which the lamp may be subjected, and which will not become fused together by such discharges.

A feature of the invention is the arrangement of the outer leads of the lamp in close proximity to one another at a given point and separated by a mesh-like insulating medium having a multiplicity of fine openings therethrough.

Further objects and advantages of my invention will appear from the following description and the accompanying drawing in which Fig. 1 is an elevation, partly in section, of an electric incandescent lamp comprising my invention, and Fig. 2 is an elevation, on an enlarged scale, showing the protective arrangement of the outer lead wires.

Referring to the drawing, the lamp there shown comprises a hermetically sealed glass bulb or envelope 10 having a neck portion 11 provided with a reentrant stem 12. Secured to the neck 11, preferably by cement 13, is a base 14 comprising a metal shell 15 and a bottom center contact eyelet 16 held together by suitable insulation 17. Mounted within the bulb 10 is an electric energy translation element or filament 18, preferably a coiled wire of a suitable refractory metal, such as tungsten. The opposite ends of the filament 18 are connected to a pair of leading-in wires 19, 20 which extend through the

seal portion 21 of the stem 12 and are connected respectively to the base shell 15 and base eyelet 16.

In accordance with the invention, the outer lead portions of the leading-in wires 19, 20 are arranged, at a given point, in close proximity to one another and separated by a layer of mesh-like insulating material. As shown in the drawing, this construction is preferably attained by providing the outer lead 22 of one of the leading-in wires 20 with a sheath or sleeve 23 of the insulating material and by twisting the so insulated portion of the said leading-in wire 20 together with the other uninsulated wire 19, preferably by a single twist. The insulating material preferably employed is a sleeve of woven or braided glass having a great number of fine openings therein, such as the woven glass tubing commercially obtainable at present. However, other suitable insulating material, such as a woven sleeve of asbestos or other similar material of a non-combustible nature, may be used if desired. By using such an insulating material having a multiplicity of minute openings, the high voltage discharge can pass through the said openings and so jump across the small gap between the closely arranged portions of the leading-in wires without causing a fusing together of said wires. To prevent the leading-in wires 19, 20 from becoming fused together at the points where they separate from the twist, under the influence of a high voltage discharge thereat, the sleeve 23 of insulating material is continued a considerable distance beyond such points of separation.

When a lamp of the above described construction is subjected to a high voltage electrical discharge, the current passes across the small discharge space between the juxtapositioned leading-in wires, thus by-passing the discharge around the filament. In this manner, rupture of the filament and consequent inoperativeness of the lamp and the signal is prevented. Furthermore, the particular form and arrangement of the insulating material employed in the lamp according to the invention prevents the fusing together of the juxtapositioned portions of the leading-in wires, and therefore insures the continued connection of the lamp filament in the circuit, whenever the lamp is subjected to a high voltage discharge.

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

1. An electric device comprising a sealed envelope containing an electrical energy transla-

tion element, a pair of spaced leading-in wires connected to said translation element and extending through said envelope, said leading-in wires having portions arranged in close proximity to one another, and a layer of mesh-like insulating material interposed between and extending along the entire length of said closely arranged portions of said leading-in wires, said insulating material having a multiplicity of relatively minute openings therethrough.

2. An electric device comprising a sealed envelope containing an electrical energy translation element, a pair of spaced leading-in wires connected to said translation element and extending through said envelope, said leading-in wires having portions arranged in close proximity to one another, and a layer of mesh-like insulating material interposed between said closely arranged portions of said leading-in wires and extending along the entire length of said portions and for a considerable distance therebeyond, said insulating material having a multiplicity of relatively minute openings there-through.

3. An electric device comprising a sealed envelope containing an electrical energy translation element, a pair of spaced leading-in wires connected to said translation element and extending through said envelope, a sleeve of insulating material on a portion of one of said leading-in wires, said insulating material having a multiplicity of minute openings therethrough, the said insulated portion of said one of said wires being twisted together with the other of said wires.

4. An electric device comprising a sealed envelope containing an electrical energy translation element, a pair of spaced leading-in wires connected to said translation element and extending through said envelope, a covering of insulating material on the outer lead portion of one of said leading-in wires, said insulating material comprising a woven glass sleeve having a multiplicity of minute openings therethrough, the said insulated portion of said one of said wires being twisted together with the outer lead portion of the other of said wires.

HENRY H. HELMBRIGHT.