

R. H. HENDERSON.
ELECTRIC INCANDESCENT LAMP.
APPLICATION FILED MAR. 23, 1911.

1,046,785.

Patented Dec. 10, 1912.

Fig. 1.

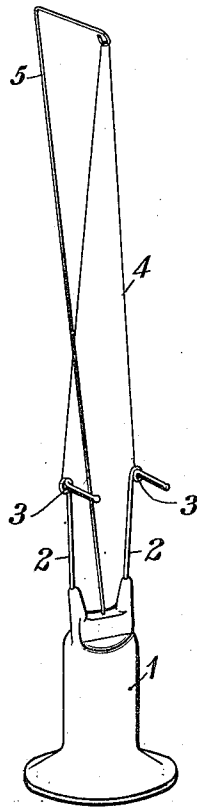


Fig. 2.

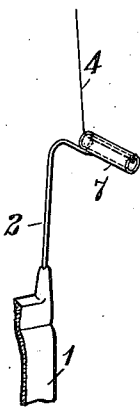
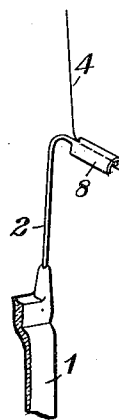


Fig. 3.



WITNESSES:

C. L. Belcher
Otto S. Schairer

INVENTOR

Robert H. Henderson
BY
Wesley C. Carr
ATTORNEY

UNITED STATES PATENT OFFICE.

ROBERT H. HENDERSON, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO WESTINGHOUSE LAMP COMPANY, A CORPORATION OF PENNSYLVANIA.

ELECTRIC INCANDESCENT LAMP.

1,046,785.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed March 23, 1911. Serial No. 616,476.

To all whom it may concern:

Be it known that I, ROBERT H. HENDERSON, a citizen of the United States, and a resident of East Orange, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Electric Incandescent Lamps, of which the following is a specification.

My invention relates to electric incandescent lamps, and particularly to the connections between the filaments and leading-in wires or filament supports thereof.

When tungsten or other similar metallic or fragile filaments are employed in electric incandescent lamps, it is a matter of considerable importance that the filaments should be so supported and so connected to the leading-in wires that they may withstand severe shocks and usage without breaking.

By providing supports that only loosely engage the filaments at intermediate points, breakage is greatly reduced, but, in order that good electrical connections may be made between the filaments and leading-in wires, it is necessary that they should firmly engage each other, or be rigidly secured together, as by fusing. The fragile filaments are, of course, most likely to break at or adjacent to these rigid connections.

The object of my invention is to provide a connection between a filament and a leading-in wire that will permit of only a limited degree of movement of the filament with respect to the leading-in wire adjacent to the rigid connection thereto, the strain upon the filament being thereby materially reduced. The connection is also such that the leading-in wire will not become unduly heated and vaporized by the incandescent filament.

Figure 1 of the accompanying drawing is a perspective view of the internal parts of a lamp embodying my invention, and Figs. 2 and 3 are similar views showing modified forms of the invention.

The lamp comprises the usual stem 1 through which extend leading-in wires 2 that are coiled to form short helices 3 of somewhat larger internal diameter than the filament near their inner ends, the portions thereof beyond the helices being bent laterally at right or other suitable angles to the main portions thereof. A—V— or hairpin

shaped filament 4 is supported at its bend 53 or bight portion by means of a suitable resilient substantially L shaped anchor 5 that is carried by the stem 1, the filament being bent near its ends to project through the helices 3 in the leading-in wires, and so that its end portions will extend substantially parallel and adjacent to the laterally bent end portions of the leading-in wires. The filament and the leading-in wires are rigidly or otherwise so secured together at their extremities as to provide good and certain electrical connections between them, such connections being preferably effected by fusing or pasting the leading-in wires to the filament.

The end portions of the filament are normally held resiliently in engagement with the helices 3 in the leading-in wires by the anchor 5 in such a manner that a suitable degree of relative movement between the said parts is permitted. Most of the current supplied to the lamp, therefore, normally passes from one leading-in wire to the filament, and vice versa, through the said intermediately engaging portions of the filament and leading-in wires, the remainder passing from the one to the other of said parts through the fused or rigid connections between their extremities where by certainty and uniformity of electrical conductivity is insured. On account of the small amount of current that normally traverses the laterally extending end portions of the filament, the said portions are not heated to a very high temperature, and consequently are incapable of unduly heating the leading-in wires and of thereby vaporizing them. This is an important and valuable feature in lamps that are adapted to be traversed by large amounts of current and in which large amounts of heat are generated, such as street series lamps.

The leading-in wires are, of course, of sufficient diameter as not to be materially heated by the current traversing them and also to permit of rapidly and effectively conducting heat away from any portions thereof that may be more highly heated than the remaining portions.

By reason of the fact that the freedom of relative movement between the end portions of the filament and leading-in wires is somewhat restricted by their being resili-

ently held in engagement, the strains upon the filament adjacent to the points of rigid connection to the leading-in wires are materially reduced and limited. The filament is thus supported so as to permit of the maximum degree of flexibility and freedom of movement consistent with good construction and reliability of continuity of the electrical circuit of the lamp, and consequently the liability of its becoming broken in handling and in use is much more remote than would otherwise be the case.

In Fig. 2 a modification is shown in which a tube 7 is formed at the end of the leading-in wire instead of a helix. This may be a separate tube attached to the ordinary leading-in wire or fashioned on its end, or formed in any other convenient manner. The filament is fused, pasted, or otherwise suitably secured to the free end of the tube.

In the modification of Fig. 3 the end portion of the leading-in wire is flattened, and the flattened portion is curved downwardly to form a more or less complete cylinder or tube 8 through which the filament extends and to the extremity of which it is fused, pasted, or otherwise suitably secured. The filament preferably enters the cylinder or tube closely adjacent to the unflattened portion of the leading-in wire.

Other modifications may also be made in the shape and construction of the leading-in wires, and in the relative positions thereof with respect to the filament without departing from the spirit of my invention, and I desire to cover herein all such modifications.

I claim as my invention:

1. An incandescent lamp comprising a filament having an end portion bent at an angle to its main portion, and a member having an end portion that extends substantially parallel to the bent end portion of the filament and the extremity of which is secured to the extremity of the filament.

2. An incandescent lamp comprising a filament having its end portions bent laterally and a filament support having an intermediate seat for the filament, the support

and filament being secured together beyond the seat.

3. An incandescent lamp comprising a filament having its end portions bent laterally and a filament support having an intermediate seat for the filament, the support and filament being secured together at their extremities.

4. An incandescent lamp comprising a filament having its end portions bent laterally, a support having a helical portion and an end extension beyond said portion and a filament projecting through said portion and united to the said end extension.

5. An incandescent lamp comprising a filament support having a helical portion and an end extension beyond said portion and a filament projecting through said portion and secured to the said end extension.

6. An incandescent lamp comprising a filament having its end portions bent laterally and a member having an intermediate portion embracing the filament and its extremity secured to the filament.

7. An incandescent lamp comprising a filament having its end portions bent laterally and a member having an intermediate portion embracing the filament, the filament and said member being secured together beyond the said intermediate portion.

8. An incandescent lamp comprising a filament having a straight end portion bent at an angle to its main portion, and a filament supporting member having an intermediate portion adapted to engage the filament at some point adjacent to the bend thereof, and an end portion which extends substantially parallel to the bent end portion of the filament and is secured thereto at its extremity.

In testimony whereof, I have hereunto subscribed my name this 15th day of March, 1911.

ROBERT H. HENDERSON.

Witnesses:

GEORGE P. SCHOLL,
CHARLES E. KELLY.