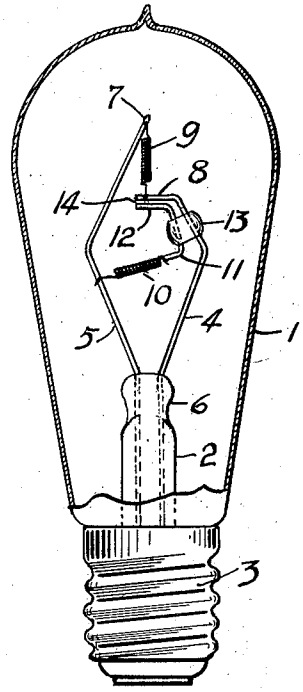
April 20, 1926. 1,581,690

A. L. POWELL

TWO-FILAMENT STREET SERIES LAMP

Filed Dec. 19, 1921



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TWO-FILAMENT STREET-SERIES LAMP.

Application filed December 19, 1921. Serial No. 523,263.

To all whom it may concern:

Be it known that I, ARTHUR LESTER POWELL, a citizen of the United States, and a resident of Bloomfield, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Two-Filament Street-Series Lamps, of which the following is a specification.

This invention relates to incandescent electric lamps and relates more particularly to what are commonly known as street series lamps.

An object of the invention is the provision of a device applicable to an electric incandescent lamp whereby the arc resulting from the failure of a filament is utilized to effect a readjustment of adjacent elements for the purpose of either cutting in a secondary filament or for closing the circuit by making other suitable connections.

A still further object is to provide a two-filament lamp of a simple and economic construction with a minimum amount of structural parts and in which a reserve or secondary filament is cut into service upon the failure of a primary filament.

It is well-known that, when electric incandescent lamps are operated in a series circuit the breakage of the filament of one of the lamps will interrupt the flow of current and thus cause the remaining lamps of the circuit to be extinguished. It also happens that, when the filament of a lamp breaks, an arc will form across the space between the broken ends of the filament. The intense heat of the arc thus formed melts the filament and leading-in wires to a point within the stem of the lamp with disastrous results, often breaking the continuity of the circuit.

The foregoing disadvantages are obviated by the present device which contemplates utilization of the arc produced by a break in the filament for automatically connecting a secondary filament.

The present embodiment of the invention provides an incandescent lamp constructed in such manner that, in the event of a break occurring in the filament, irrespective of whether the filament is hot or cold, passage of current will create an arc which will serve to fuse a suitably positioned conductor to another, thereby terminating the arc and closing the circuit. The present illustration shows a secondary filament which is so disposed as to be put in circuit when the circuit has been closed subsequent to a break in the primary filament. This secondary filament is preferably of the same current rating but of a lower candle power than the primary filament, it being, in many cases, only necessary to provide temporary illumination upon the failure of the primary filament in order to comply with the rules requiring continuous illumination of a given location. By the provision of a filament of less candle power, an inspector may readily discover lamps in which the primary filament has failed and replace them with new lamps. It is obvious, however, that the secondary filament may be used as a permanent lighting element if it is found desirable.

The invention will be readily understood understood from the accompanying drawing which shows a lamp in which the leading-in wires are particularly adapted for the installation of the secondary filament and necessary parts which cooperate therewith. A filament support of the type illustrated herein constitutes the subject matter of my co-pending application Serial No. 523,262, filed December 19, 1921, filament support for series lamps and assigned to the Westinghouse Lamp Company.

A device for accomplishing the aforementioned objects may comprise a supplemental conductor insulated from, and secured to, one of the leading-in wires and so disposed as to provide a gap of the required width between one of its ends and an end of a leading-in wire. The opposite end of the conductor may be either directly connected to the opposite leading-in wire or to the end of a secondary filament having the opposite end thereof secured to the last mentioned leading-in wire.

Referring now to the drawing 1 designates an envelope or bulb of the usual construction having a hollow stem 2 sealed therein and having a base 3 secured to the end thereof in the usual manner. Leading-in wires 4 and 5 extend through a press 6 of the stem 2 in which they are supported and project upwardly within the bulb in such manner that their ends 7 and 8 are suitably positioned to support a primary filament 9, the ends of which are welded or otherwise secured to said wires 4 and 5. In lamps of this type, the current travels in the usual manner from its source through

the leading-in wire 4, filament 9 and the leading-in wire 5; thus, the filament 9 is normally maintained in circuit. The filament 9 may, however, burn out or be ruptured in some manner, thereby preventing the passage of current. It is then desirable to engage another filament in order to maintain the continuous luminosity of the lamp as well as to prevent the series circuit from becoming disrupted.

The present embodiment of the invention provides a secondary filament 10, preferably of the same current rating as the primary filament and having its ends connected to the leading-in wire 5 and to an auxiliary or supplemental conductor 11. This conductor is provided with a projection 12 and is adapted to be positioned with the said projection adjacent, and preferably parallel, to the end 8 of the leading-in wire 4. It has been found desirable to support the supplemental conductor 11 by a glass bead 13 with sufficient material intermediate the leading-in wire and the conductor to afford adequate insulation. The supplemental conductor 11 is juxtaposed with respect to the leading-in wire 4 so as to provide a relatively small gap 14 between the projection 12 and the end 8 of the leading-in wire.

The leading-in wires are usually made of nickel and are consequently, readily fusible. Thus, if the primary filament breaks and the circuit is thus disrupted, an arc will be first produced between the broken ends of the filament and, as the filament wire melts, the arc will continue between the leading-in wire 5 and the end 8 of the leading-in wire 4, whereupon the ends of the leading-in wires will become molten and the end 8 of the leading-in wire 4 will quickly drop and make contact with the end 12 of the supplemental conductor 11, or an enlargement or bead will form on the leading-in wire and span the gap 14, thereby joining the leading-in wire 4 to the conductor. The resistance being less in the circuit formed through the connection between the leading-in wire 4 and the supplemental conductor 11 than in the arc gap, the current will then pass through the leading-in wire 4, the conductor 11, the filament 10 and thence through the leading-in wire 5, and cause the filament 10 to become incandescent.

It is obvious that, if desirable, the filament 10 might be dispensed with, in which case, the conductor 11 would be connected to the leading-in wire 5. With this construction, substantially the same advantage would be obtained as above described, inasmuch as provision is made for a continuation of the passage of current upon the failure of the filament 9; the arc being again employed to perform the function of closing the circuit, as is the case in the employment of the two filaments.

The end 8 of the leading-in wire 4 and the end 12 of the conductor 11 are so positioned with respect to each other as to provide a gap 14 of such dimension that, if the filament breaks when cold, the line voltage will jump the gap and cause a fusing of the end 8 to the supplemental conductor 11, thus putting in circuit the secondary filament or in the event that the secondary filament is omitted, a connection will be made and the continuity of the circuit will be maintained.

A lamp provided with the present invention may be burned in practically any position. For instance, if the lamp is placed in service with the tip down, a break in the filament will first cause an arc to be produced between the ends thereof and then between the leading-in wire wire 5 and the end 8 of the leading-in wire 4. This arc will cause the end of the leading-in wires to fuse and produce an accumulation of metal, in other words, form a bead or ball at the ends of the leading-in wires. The accumulation of metal thus formed at the end 8 will effect a bridging of the gap 14 to cut in the filament 10 or close the circuit in the event that the filament 10 is omitted.

It is evident that the present invention may be applied in an expeditious and economic manner to the type of lamp illustrated without any alteration in the standard construction. Any commercial lamp of this type may be equipped with the present invention during manufacture, at which time the supplemental conductor may be secured to the leading-in wire or to any other suitable portion of the structure, and the filament may be connected between the said conductor and the opposite leading-in wire.

I have shown and described one form of a device which has been found a desirable embodiment of the invention, it is, however, to be understood that the invention is not restricted to the structural details shown and that many modifications may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. An electric lamp comprising a filament, leading-in wires connected to opposite ends of said filament, a supplemental conductor supported by and insulated from one of said leading-in wires, conducting means between said supplemental conductor and the other one of said leading-in wires, one end of said conductor being positioned in near relation to an end of the supporting leading-in wire, whereby an arc produced by a break in said filament fuses said leading-in wire and said conductor to provide a closed circuit.

2. An electric lamp comprising leading-in wires of relatively large diameter and low fusing point, a primary filament having its ends connected to the exposed ends of said

wires, a supplemental conductor of relatively large diameter and low fusing point supported upon and insulated from one of said leading-in wires, one end of said conductor being spaced from the end of the leading-in wire upon which it is supported, the opposite end of said supplemental conductor being connected to the other leading-in wire by an auxiliary filament, whereby an arc created by failure of the primary filament effects a fusion of the adjacent ends of the leading-in wire and the auxiliary conductor supported thereon, causing said auxiliary filament to be put in circuit.

3. An electric lamp comprising a primary and a secondary filament, conductors of relatively low fusing point being connected to said filaments, said secondary filament being normally maintained out of circuit by a gap between the conductor connected thereto and the conductor connected to the primary filament, whereby the arc created when said primary filament fails, operates to fuse said material and close said gap to connect said secondary filament in circuit.

4. An electric lamp comprising a stem having a press, leading-in wires secured in said press, a filament connecting the ends of said leading-in wires, a supplemental conductor supported by and insulated from one of said leading-in wires, one end of said conductor being positioned adjacent to one of said leading-in wires to provide a gap therebetween, and a filament connecting said conductor and the other leading-in wire, said gap being of such width that an arc will pass thereover upon the failure of said mentioned filament and cause said supplemental conductor and adjacent leading-in wire to be welded together.

5. An electric lamp comprising leading-in wires, a primary filament connected to the ends of said leading-in wires and normally in circuit, at least one of said wires being of a metal of relatively low fusing point, a supplemental conductor supported by and insulated from said low fusing point leading-in wire, a secondary filament connected to the other leading-in wire and to said supplemental conductor, the relative positions of a portion of the leading-in wire supporting the supplemental conductor and a portion of said conductor being such, that upon a failure of the primary filament, said conductor and leading-in wire will become united by fusion.

In testimony whereof, I have hereunto subscribed my name this 17th day of December, 1921.

ARTHUR LESTER POWELL.