W. R. WHITNEY.

INCANDESCENT ELECTRIC LAMP.

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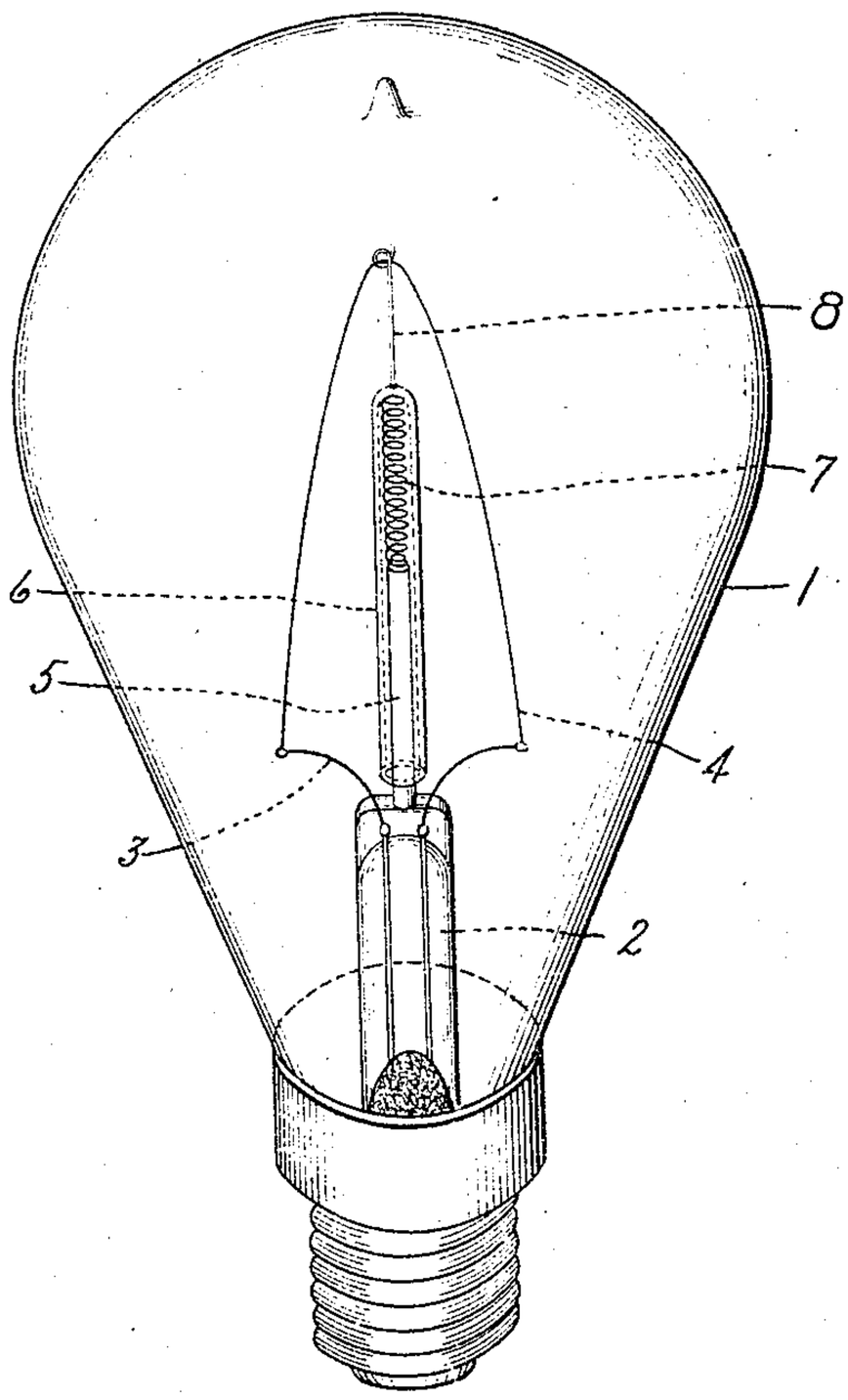
991,578. Patented May 9, 1911.



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INCANDESCENT ELECTRIC LAMP.

991,578. Specification of Letters Patent. Patented May 9, 1911.

Application filed August 19, 1907, Serial No. 389,311. Renewed September 23, 1910. Serial No. 583,502.

To all whom it may concern:

Be it known that I, WILLIS R. WHITNEY, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Incandescent Electric Lamps, of which the following is a specification.

My present invention relates to incandescent lamps and comprises means for holding the filament or filaments in position in the lamp bulb.

Tungsten, molybdenum, tantalum, and similar refractory elements now being used for incandescent lamp filaments have a tendency to become soft and plastic when heated to high incandescence, and filaments of these materials must ordinarily be anchored or supported within the lamp bulb in order that deformation and destruction of the filament may not result when the filament is hot and soft.

The novel features of my invention are particularly pointed out in the appended claims, and for better understanding thereof, reference should be had to the following description taken in connection with the accompanying drawing.

In the drawing, the incandescent lamp 1 is provided with a stem 2 having suitable supply wires 3 connected with a refractory filament 4 of tungsten or other material having a tendency to sag during normal operation. The lamp stem 2 is provided with a cylindrical glass pedestal 5 projecting upward along the axis of the lamp and serving to support the glass tube-cap 6. This tube-cap is movable longitudinally along the pedestal and incloses a spiral spring 7 of carbon, as shown in the drawing. The annular tube-cap carries, at its closed end, a filament support 8 of tantalum, or other refractory material inert with respect to the filament 4.

When the lamp is assembled, the carbon spring 7 is compressed somewhat by pushing the tube 6 downward on pedestal 5. Thereafter, the spring serves to hold filament 4 under a tension sufficient to prevent sagging when soft but insufficient to cause rupture thereof. Very material contraction of the filament 4, during normal heating and cooling or otherwise, may occur without materially changing the tension under which the filament is subjected by the spiral spring 7.

The spiral spring 7 may be made much as ordinary carbon lamp filaments are made, except, however, that it should be wound into a spiral before baking. Such a spring does not lose its resilient qualities when subjected to the heat of the lamp. By the arrangement described, the tungsten filament is adequately protected from contamination with carbon or other material from the resilient supporting means.

I have illustrated my invention as applied to a low voltage or series lamp, but obviously this spiral spring arrangement could easily be applied to a multiple filament lamp by merely adding additional filament supports 8.

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

1. The combination of a refractory metal filament, a resilient carbon support therefor, and protective means interposed between said filament and said support.

2. The combination of a refractory metal filament, supporting means engaging therewith, and a carbon spiral for resiliently supporting said means.

3. The combination of a lamp stem, a pedestal thereon, a tubular cap movable longitudinally on said stem, a spiral spring inclosed by said cap and engaging with said stem, and filament supporting means carried by said cap.

4. The combination of a carbon spiral, a refractory metal filament, and means for holding said spiral under compression and for holding said filament under tension.

5. The combination of a spiral carbon spring, means for applying the power of said spring to hold the metal filament under tension, and a glass envelop inclosing said spring.

6. The combination of a carbon spring, a metal filament, means for applying the power of said spring to hold the filament under tension, and means for protecting said filament from contamination by said carbon spring.

7. The combination with a refractory metal filament of a resilient carbon member for supporting said filament and suitable

means interposed between said resilient member and said filament through which the member may act thereon.

8. The combination with a lamp stem of a pair of members telescoping one another, one of said members being secured to said stem and the other comprising an element adapted to engage a filament, and means associated with said members and inclosed by one of them tending to produce relative longitudinal displacement thereof.

9. The combination with a filament of slidably mounted supporting means comprising an element engaging therewith and suitable means acting upon said supporting means to cause it to keep said filament taut, said last-named means being inclosed by one of the relatively slidable parts.

In witness whereof, I have hereunto set my hand this 17th day of August, 1907.

WILLIS R. WHITNEY.

Witnesses:

BENJAMIN B. HULL,

HELEN ORFORD.