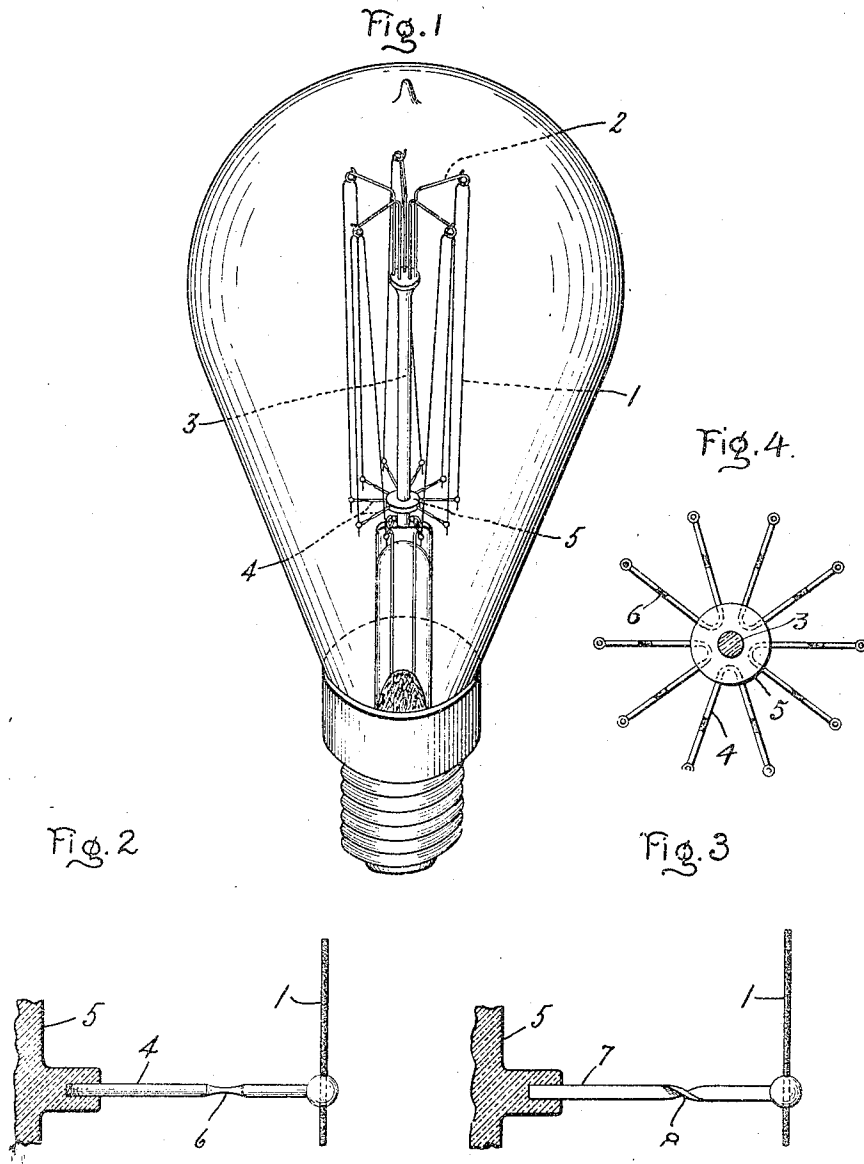


W. R. WHITNEY.
METAL FILAMENT LAMP.
APPLICATION FILED AUG. 19, 1907.

1,013,915.

Patented Jan. 9, 1912



WITNESSES:
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WILLIS R. WHITNEY, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

METAL-FILAMENT LAMP.

1,013,915.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed August 19, 1907. Serial No. 389,312.

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 Metal-Filament Lamps, of which the following is a specification.

My present invention relates to metal-filament lamps.

It comprises means for protecting filaments against excessive longitudinal stress.

Lamp filaments of tungsten, molybdenum, and other similar refractory metals can be operated at very high temperatures in lamps, but when so operated, are in a somewhat soft and pliant condition and therefore require supporting means to prevent distortion of the filament and short circuits in the lamp. It is common practice to hold the filaments in their proper position by means of resilient supports engaging with the ends of the filament loops. These supports are put under tension when the lamp is assembled and the tension is intended to be just sufficient to hold the filament straight when hot, but not sufficient to tear the filament in two, either during normal burning or after the filament has shrunk somewhat in aging, as some of these filaments seem to do. The tension exerted by the filament supports is supposed to be uniform for all the filaments, but in practice it varies somewhat with the skill of the girl who assembles the lamps.

The present invention aims to protect filaments against excessive stress by the use of anchoring wires having a contracted or weakened portion which will bend and allow the end of the wire to tip in case the tension on the filament becomes dangerous.

The details of my invention will be better understood by reference to the accompanying drawing, in which—

Figure 1 is a perspective view of a completed lamp; Fig. 2 is an enlarged elevation of one current supply wire; Fig. 3 is a modified form of supply wire, and Fig. 4 is a detail showing the current supply wires grouped about the central pedestal.

The metal filaments may be of tungsten or other suitable metal and supported at their ends by refractory springs of tungsten or tantalum. These springs may be conveniently mounted in the end of a glass pedestal

3 and are so adjusted as to maintain the filament loops in a taut condition when hot, without subjecting them to undue stress during normal contraction. The lower ends of the metal filaments are welded or pasted to current supply-wires 4 disposed radially in a central hub 5 of glass. These radial current supply wires 4 may be cylindrical, as shown in Fig. 2, and provided with a weakened portion 6 made by denting or otherwise contracting the wire. Inasmuch as the heat distribution in the wire is good, this contracted portion will not burn out even though the cross-section may be considerably less than other parts of the supply-wire. If, now, by any chance the lamp has been improperly assembled, and one or more of the spring supports 2 have been placed under too great a tension, the abnormal stress on the filaments will produce bending of the current supply-wires at the point 6 and the danger of filament rupture will be removed. I do not rely on the elasticity or resiliency of this contracted part of the current supply-wire to secure spring tension on the filament, but I make use of it merely as a safety device which bends in cases where the filament might otherwise be ruptured. The current supply-wire may be of platinum, nickel, nickel-alloy, copper, or other suitable metal.

The modification illustrated in Fig. 3 consists of a flat ribbon 7, say of nickel, sealed into the glass hub 5 of the pedestal and given a partial or complete twist at the point 8 between the pedestal and the filament 1. This twist turns the supply-wire so that it is mechanically weak in the direction of the filament and is thereby capable of acting as a safety device in the same way as does the contracted wire of Fig. 2.

I make no claim in this application to the refractory springs 2 of tungsten since such resilient supports form the subject matter of my copending application, Ser. No. 378,932, filed June 14, 1907.

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

1. In a metal filament lamp, a filament loop and an anchorage for said loop having a local contraction adapted to take a permanent bend as a result of course exerted by the filament on the anchorage to protect said filament from dangerous longitudinal stress.

2. In a lamp, a fragile metal filament, and an anchoring wire therefor having a weakened portion adapted to limit the tension to which the filament can be subjected by undergoing permanent deformation whenever tension on the filament exceeds a certain amount.

3. In a lamp, a metal filament, and a current supply wire therefor mechanically weak to stresses along the filament and adapted to take a permanent bend to protect the filament from mechanical rupture whenever the stress on the filament becomes excessive.

4. The combination of a filament loop, a resilient support for one end of the loop, and an anchorage for the other end of the loop capable of deformation under the pull of the filament to protect the filament from dangerous tension.

5. The combination of a fragile filament loop, a resilient support for one end of the loop, and means at the other end of the loop adapted to compensate for improper adjustment of said resilient support by undergoing permanent deformation as a result of force exerted by the filament.

6. The combination of a filament which becomes soft during normal running, resilient means for holding said filament in position, and an anchorage for said filament capable of taking a permanent bend under

force exerted by the filament to protect said filament from dangerous longitudinal stress.

7. The combination of a plurality of looped filaments, resilient supports for said filaments, and current supply-wires connected with said filaments and each having a contracted portion for protecting its filament from dangerous longitudinal stress by undergoing permanent deformation under force exerted by the filament.

8. The combination with a filament suitably supported at one end of supporting means for the other end of the filament adapted to protect said filament from dangerous longitudinal stress by undergoing permanent deformation under the pull of the filament.

9. The combination with a fragile filament loop suitably supported at one end of supporting means for the other end of the loop mechanically weak to longitudinal stresses in the filament so as to be capable, by undergoing permanent deformation as a result of force exerted by the filament of protecting the filament from rupture.

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

WILLIS R. WHITNEY.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.