

T. E. ROBERTSON.  
 INCANDESCENT ELECTRIC LAMP.  
 APPLICATION FILED NOV. 2, 1908.

973,703.

Patented Oct. 25, 1910

Fig. 1.

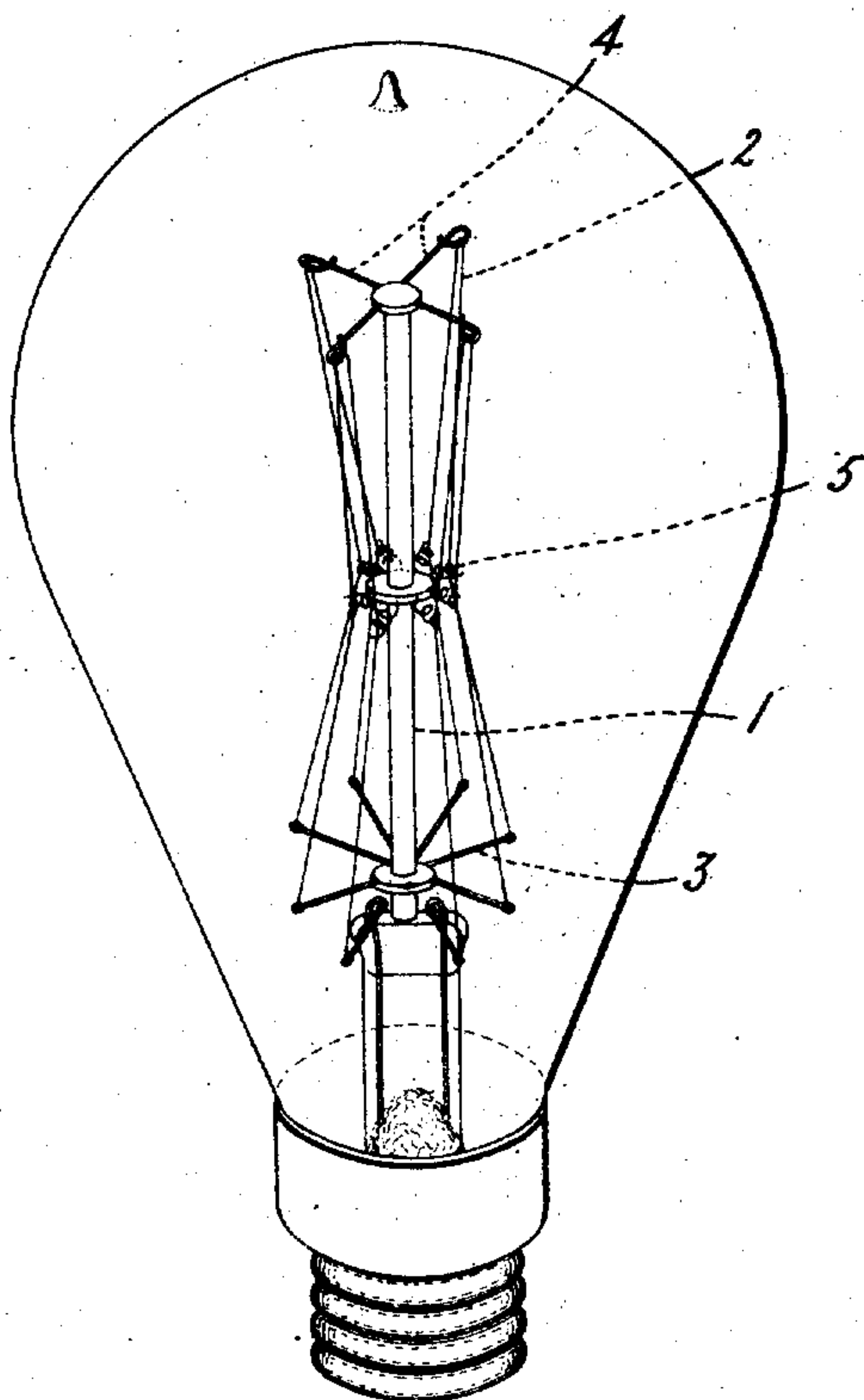
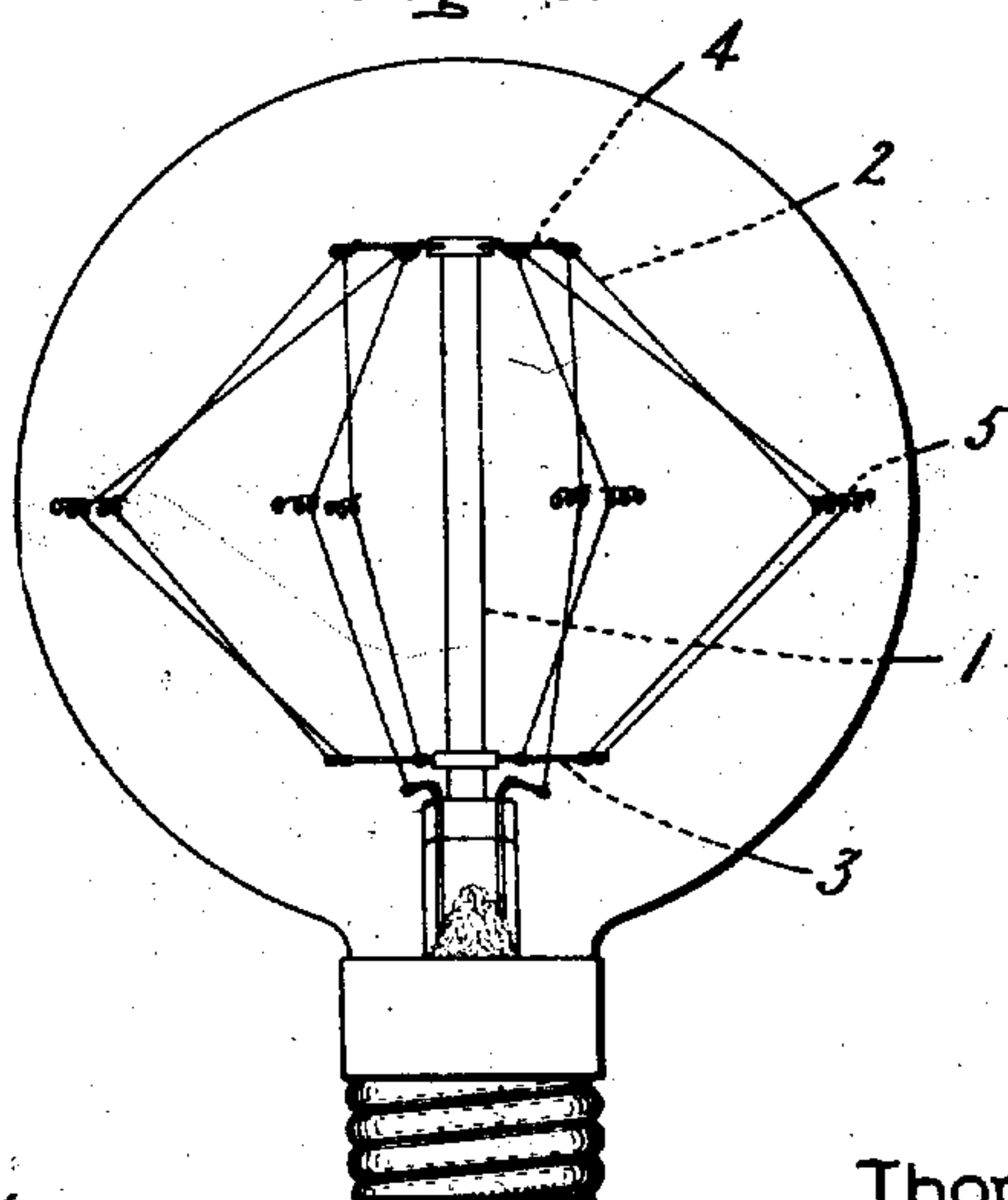


Fig. 2.



Witnesses:

*George H. Tilden*  
*J. Ellis Allen*

Inventor:

Thomas E. Robertson,  
 by *Alfred H. Davis*  
 Att'y.

# UNITED STATES PATENT OFFICE.

THOMAS E. ROBERTSON, OF CATFORD, ENGLAND, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

## INCANDESCENT ELECTRIC LAMP.

973,703.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed November 2, 1908. Serial No. 460,565.

*To all whom it may concern:*

Be it known that I, THOMAS E. ROBERTSON, a subject of the King of Great Britain, residing at Catford, Kent, England, have  
5 invented certain new and useful Improvements in Incandescent Electric Lamps, of which the following is a specification.

The present invention relates to incandescent electric lamps of the type having  
10 metallic filaments.

In lamps having filaments of tungsten, tantalum, and other highly refractory metals, it is necessary that the filament should be of considerable length in order to have the necessary resistance for operation at practical  
15 voltages, and since the filaments are necessarily long, special supporting means must be used to hold the filament in place.

According to my present invention, the  
20 filament loops are supported intermediate their ends by extensible elastic anchors capable of transverse movement to compensate for unequal and abnormal expansion and contraction.

Embodiments of my invention are illustrated in the accompanying drawing, in which—

Figure 1 shows a lamp with intermediate anchors pulling the filament legs toward the  
30 central pedestal; and Fig. 2 shows a modified form in which the filament legs are pulled outward toward the bulb of the lamp.

The lamp shown in Fig. 1 comprises a central pedestal 1 about which a plurality  
35 of metal filament loops 2 are grouped. Each loop is welded or otherwise connected at its lower or free ends to current supply conductors 3 and is held in place at the opposite or looped end by supports 4, preferably  
40 resilient. Intermediate these end supporting means, I provide a number of spirals or other suitably shaped resilient anchors, which are connected to the glass pedestal and are provided with loops through which  
45 the filament legs pass, though they may be connected thereto by means of a pasted joint if desired, since it is immaterial whether the connection with the filament is rigid or not.

In the modification shown in Fig. 2, the  
50 reference numerals of which correspond with those of Fig. 1, the intermediate supports or anchors 5 are connected to the lamp bulb or globe instead of to the glass pedestal.

It is well known that metallic filaments  
55 contract considerably after having burned

a short time, and inasmuch as this contraction varies greatly and in a somewhat uncertain manner, it has been found very difficult hitherto to allow for this variation in contraction.

In a lamp constructed according to my invention, contraction of the filaments will cause the anchors 5 to expand or stretch out to a greater length, and thus allow the filaments to straighten out somewhat. These  
60 intermediate anchors, being of a springy nature, will maintain the filaments at a proper tension without danger of placing them under excessive strain.

When my invention is employed, it is not  
70 necessary that the end supports 4 be resilient, and the filaments may be rigidly held at their extremities; for provided they are not perfectly straight, the intermediate anchors will allow them to straighten as  
75 they contract. Moreover, if the filaments are rigidly connected with the anchors 5, or should the two weld together during normal operation, the arrangement is such that  
80 should one portion of a filament contract or expand to a greater extent than the other portion, the anchor will compensate for this inequality by combined longitudinal and transverse movement.

Another important result of this arrangement is that the filaments are always under tension during transit, so that hammering of the filaments upon their supports is prevented and sudden shocks during transport are absorbed by the intermediate springs.  
90

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

1. In an incandescent lamp, a filament loop, suitable supporting means for the ends and the bend of said loop, and a resilient  
95 anchor engaging said loop intermediate its end and bend supports.

2. In an incandescent lamp, a filament loop, supports for the ends and the bend of said loop, and resilient anchors intermediate said end and bend supports pulling the filament legs sidewise.  
100

3. In an incandescent lamp, the combination of a central pedestal, a plurality of filament loops grouped about said pedestal,  
105 supports for the ends and the bends of said loops, and resilient anchors maintaining said filament loops in tension.

4. In an incandescent lamp, the combination of a filament loop, current supply con-  
110



ductors therefor, a resilient support for the bend of said loop, and resilient anchors between said support and said current supply conductors.

5 5. In an incandescent lamp, the combination of a filament extending between a current supply conductor and a support, and a resilient anchor situated intermediate said conductor and said support and maintain-  
10 ing said filament in tension.

6. In an incandescent lamp, the combination of a filament stretched between supporting means, and an intermediate resilient anchor engaging said filament and acting  
15 in a direction transverse thereto.

7. In an incandescent lamp, the combination of a pedestal stem, a pair of filament carriers suitably spaced apart on said stem, a filament extending between said carriers,  
20 and a resilient anchor for the intermediate portion of said filament.

8. In an incandescent lamp, the combination of a pedestal stem, a pair of filament carriers suitably spaced apart on said stem, a filament extending between said carriers, 25 and a resilient anchor connected to said stem between said carriers and acting upon the intermediate portion of said filament to maintain it in tension.

9. In an incandescent lamp, the combination of a pedestal stem, a pair of filament carriers suitably spaced apart on said stem, a filament extending between said carriers, and a resilient anchor acting to draw the  
30 intermediate portion of said filament toward said pedestal. 35

In witness whereof, I have hereunto set my hand this 23rd day of October, 1908.

THOS. E. ROBERTSON.

Witnesses:

E. J. SKOYLES,

H. D. JAMESON.