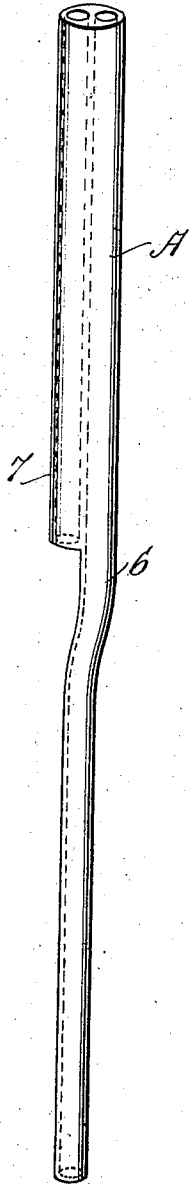


J. J. O'BRIEN.  
TUNGSTEN INCANDESCENT LAMP.  
APPLICATION FILED JUNE 1, 1910.

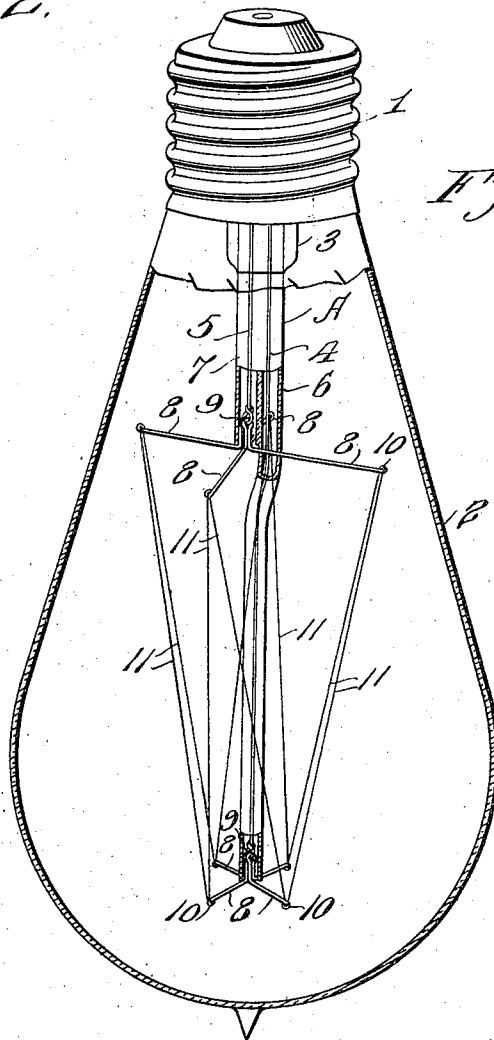
987,483.

Patented Mar. 21, 1911.

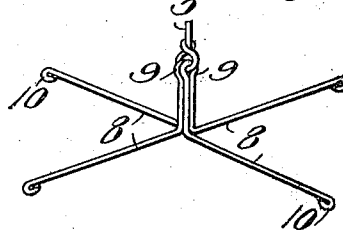
*Fig. 2.*



*Fig. 1.*



*Fig. 3.*



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN J. O'BRIEN, OF SHAMOKIN, PENNSYLVANIA.

## TUNGSTEN INCANDESCENT LAMP.

987,483.

Specification of Letters Patent.

Patented Mar. 21, 1911.

Application filed June 1, 1910. Serial No. 564,466

*To all whom it may concern:*

Be it known that I, JOHN J. O'BRIEN, a citizen of the United States, residing at Shamokin, in the county of Northumberland and State of Pennsylvania, have invented new and useful Improvements in Tungsten Incandescent Lamps, of which the following is a specification.

This invention relates to incandescent electric lamps of the tungsten filament type, and it has to do more particularly with means for supporting the filament and for supplying current thereto in such a manner that a break in the filament will not render the entire lamp useless since remaining portions of the filament will continue intact and carry current.

The invention has for one of its objects to provide an extremely simple, practical and effective lamp of this character which is comparatively simple and inexpensive to manufacture and possesses long life.

Another object of the invention is the provision of an improved support through which lead-in wires pass to connect with the filament at various points so that substantially the entire filament would have to be destroyed before light would fail to be emitted.

Another object of the invention is the employment of a novelly constructed lead-in wire whereby the filament is not only connected in circuit but is supported in proper position.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawing, which illustrates one embodiment of the invention, Figure 1 is a sectional perspective view of an incandescent lamp. Fig. 2 is a perspective view of the support of the filament. Fig. 3 is a perspective view of one of the lead-in wires connected with the filament.

Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawing, 1 designates the base of the lamp, and 2, the evacuated globe or bulb, and in the base portion of the bulb is the usual sealing-in tube 3 through which the lead-in wires 4 and 5 extend to supply current to the filament. On the sealing-in

tube is a filament support A which has a base portion provided with a double bore formed in any suitable manner, as for instance by welding two pieces of glass tube 6 and 7 together, the tube 7 being shorter than the tube 6 which extends close to the outer end of the bulb. The lead-in wires extend longitudinally through the bores in the supporting member, and attached to the extremity of each lead-in wire is a plurality of copper or other conductor filament-supporting arms 8. These arms are doubled strips of wire which are fastened to the lead-in wire by bending the latter into a hook 9. The doubled portions of the wire arms extend partially into the support A and the projecting portions of the wires are bent into radially-disposed outstanding arms that terminate in hooks 10. A series of these arms is arranged on the extremity of the support A and at an intermediate point thereon, and strung on these arms is a continuous filament 11 of tungsten or the like. Since the supporting arms for the filaments are conductors and connected with the lead-in wires, it is obvious that current will flow through each loop of the filament, and hence if any loop should break, the remaining loop or loops would continue to carry current and glow, and it is only when all the loops are broken that the filament is useless.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. An incandescent lamp including a bulb, lead-in wires terminating within the bulb at different points, a plurality of branches on the inner end of each lead-in wire, said branches radiating from a common point and one set of branches being of different length than the other set, and an endless filament formed into loops and at-

tached alternately to the successive branches of the lead-in wires.

2. An incandescent lamp including a bulb, a sealing-in tube, an insulating support attached to the tube and having separate bores of different lengths, lead-in wires passing through the bores and sealed in the said sealing-in tube, the inner ends of the said wires terminating within the bores, conductors attached to the free ends of the lead-in wires and having portions extending into the bores of the support to be steadied by the latter, and a filament extending successively from the conductors attached to one lead-in wire to those attached to the other.

3. An incandescent lamp including a bulb, a filament support having a double bore base portion, wires leading longitudinally through the support, one of the wires terminating at the end of the support and the other at an intermediate point in the support, a plurality of branches connected with the extremity of each wire, hooks on the extremities of the branches, and a filament engaged successively with the branches of both wires.

4. In a lamp of the class described, the combination of a lead-in wire, a tubular insulator therefor, a plurality of branches

formed of wires having their middle portions looped and connected with the lead-in wire at a point within the support, said branches being bent laterally in outstanding relation to the support.

5. In a lamp of the class described, the combination of a tubular insulating support, a wire leading through the support, and a plurality of branches formed of looped wires connected with the first-mentioned wire at a point within the support, the said branches being bent laterally in radial relation to the support.

6. In a lamp of the class described, the combination of a tubular insulating support, a wire leading through the support, a plurality of branches formed of looped wires connected with the first-mentioned wire at a point within the support, the said branches being bent laterally in radial relation to the support, and devices on the ends of the branches to engage with and support a filament.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN J. O'BRIEN.

Witnesses:

E. O. FARLEY,  
JOHN JORDAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."