

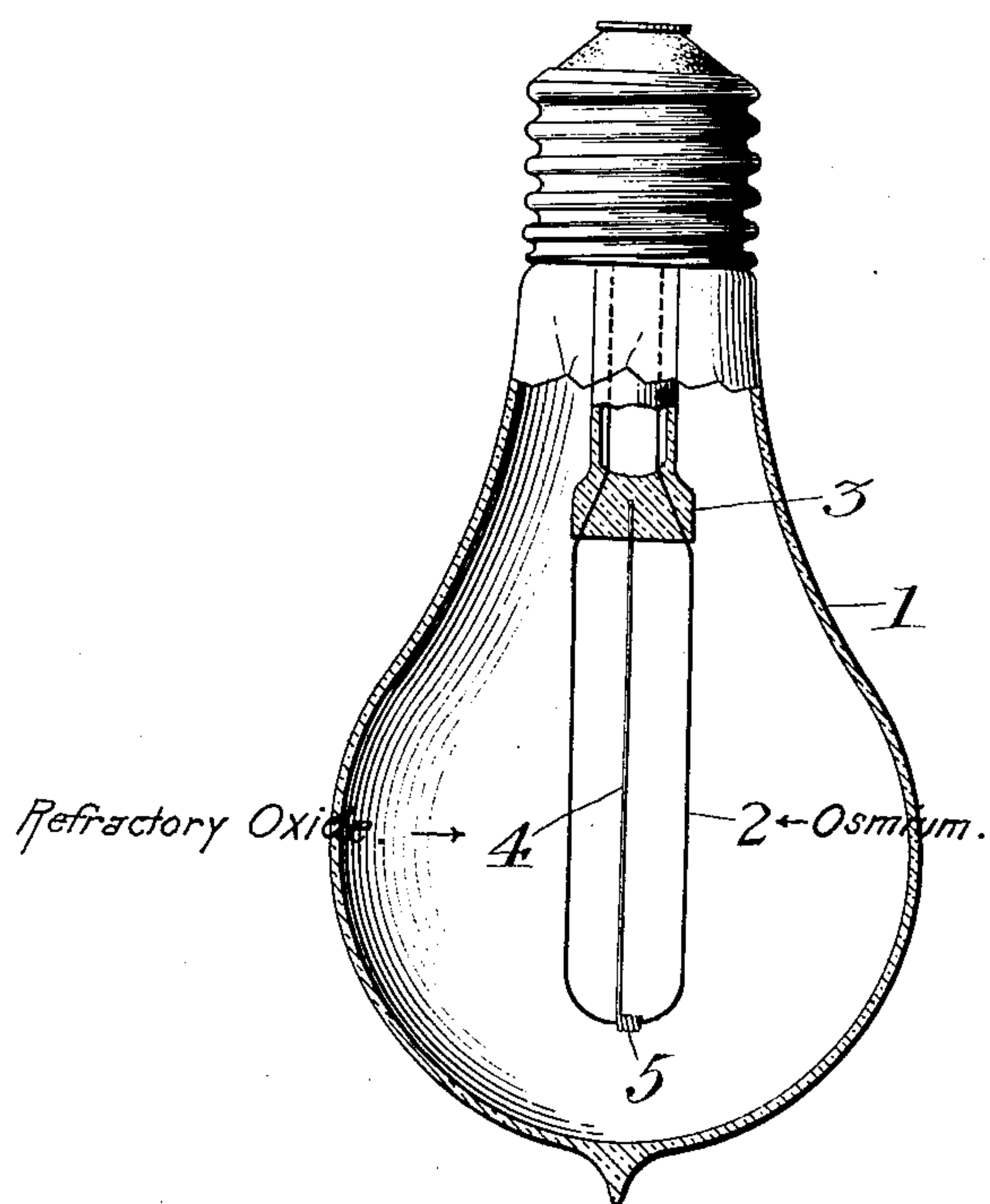
No. 814,632.

PATENTED MAR. 6, 1906.

C. A. VON WELSBACH.

SUPPORT FOR OSMIUM FILAMENTS.

APPLICATION FILED MAY 31, 1901. RENEWED JULY 31, 1905.



Witnesses:

Chas. J. O'Neill
J. E. Hutchison

Inventor:

Carl Auer von Welsbach,
by Lemuel H. Goldborough,
attorneys

UNITED STATES PATENT OFFICE.

CARL AUER VON WELSBACH, OF VIENNA, AUSTRIA-HUNGARY.

SUPPORT FOR OSMIUM FILAMENTS.

No. 814,632.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed May 31, 1901. Renewed July 31, 1905. Serial No. 271,965.

To all whom it may concern:

Be it known that I, CARL AUER VON WELSBACH, of IV Wiedener Hauptstrasse No. 69, Vienna, Austria-Hungary, have invented certain new and useful Improvements in Supports for Osmium Filaments, of which the following is a specification.

Osmium filaments for incandescing electric lamps when brought to a dazzling white heat are quite flexible, so that if brought into a horizontal or inclined position they tend to droop or sag by their own weight. Moreover, owing to the relatively high specific gravity of osmium and a certain degree of brittleness inherent in the filaments the latter are particularly liable to be broken during transportation, the lamps being of necessity frequently exposed to more or less violent shocks and jars. To obviate these disadvantages and dangers, it is desirable to provide the osmium filament with a suitable support or supports, suitably disposed within the lamp-bulb, so as to maintain the filament against excessive flexure or vibration under the varying conditions of use of the lamp and the vicissitudes of shipment and of handling. Prior to my present invention it has been proposed to support carbon filaments against vibration by the employment of wires of platinum or nickel, extending from some point of anchorage within the lamp-bulb and engaging at their free ends the carbon filament. The employment of metallic wires of this character would, however, be impracticable with osmium filaments, for the reason that when brought into contact with white-hot osmium the platinum or nickel at the point of contact would alloy therewith and would thereafter be vaporized, driven off, and deposited as a black coating upon the inner surface of the bulb. Moreover, a platinum or nickel support tends to adhere by fritting to the white-hot osmium filament, thereby interfering with the free expansion and contraction of the filament and subjecting it to corresponding liability of rupture. Supports of carbon would be likewise unsatisfactory for osmium filaments, because of the inevitable formation of osmium carbon compounds, which are more volatile than the pure osmium.

The purpose of my invention is the production of supports from a material, first, sufficiently rigid when in filamentary form to sustain the osmium filaments; second, so

highly refractory that it will not frit when the latter is brought to white incandescence, and, third, of such a character that it will not react chemically upon the incandescent osmium filament. I have discovered that it is feasible to make supports embodying these desirable characteristics from certain oxids, either separately or mixed, but preferably from an intimate mixture of about ten parts, by weight, of pure thoroxid and about one part, by weight, of magnesia. These oxids in a finely divided or powdered condition should be well ground to a paste by the addition of an organic viscous binding material—as, for instance, a solution of sugar. The paste thus produced is then shaped into flexible filaments of suitable length, and one end of the filament is bent or fashioned into the form of a small loop, hook, or spiral, designed subsequently to engage the osmium filament at the required point of support. The paste filaments are then dried and subsequently burned in free air until all the organic substance is consumed. Finally, they are subjected to the action of a very high temperature until the particles are sintered or fritted together. The resultant structure possesses the required stiffness and rigidity, and the straight end may thereupon be sealed by fusion or otherwise into a hollow glass stem of appropriate diameter, adapted to be subsequently mounted within the lamp-bulb in such relation to the osmium filament that the loop or hook of the support will engage and sustain the osmium filament against sagging or vibration.

One mode of applying my invention is illustrated in the accompanying drawings, in which the numeral 1 indicates an incandescent electric-light bulb provided with an osmium filament 2, which is sealed in the glass tube 3 in the manner usually employed in incandescent electric lamps.

The numeral 4 indicates my improved support, made in the manner hereinbefore described, which support is sealed in the glass tube 3 by its upper extremity and is provided at its lower end with a spiral 5, which surrounds the filament 2 at the bend or lowest point thereof.

It is obvious that the free end of the support (*i. e.*, the end engaging the osmium filament) may be given various forms appropriate to its supporting function—as, for instance, that of a small loop, a hook, a cork-

screw whirl, or the like—permitting ready engagement with the osmium filament at the point or points where the supporting or sustaining is desired. Moreover, while I prefer for most purposes the particular mixture of thoroxid and magnesia hereinbefore specified, the composition of the oxid mixture may be varied. For example, magnesia may be replaced, either wholly or in part, by other highly refractory oxids, which when heated do not give peroxid—as, for instance, most of the rare earths—or by zirconium oxid in various proportions by weight.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of an osmium filament and a support for the same, said support composed of sintered or fritted refractory oxid, non-adherent to incandescent osmium and chemically indifferent thereto; substantially as described.

2. The combination of an osmium filament and a support for the same, said support composed of a sintered or fritted mixture of refractory oxids, non-adherent to incandescent osmium and chemically indifferent thereto; substantially as described.

3. The combination of an osmium filament and a support for the same, said support composed of a sintered or fritted mixture of rare

metal oxid and other refractory oxid; substantially as described.

4. The combination of an osmium filament and a support for the same, said support composed of a sintered or fritted mixture of rare metal oxid and magnesia; substantially as described.

5. The combination of an osmium filament and a support for the same, said support composed of a sintered or fritted mixture of thorium oxid and other refractory oxid; substantially as described.

6. The combination of an osmium filament and a support for the same, said support composed of a sintered or fritted mixture of thorium oxid and magnesia; substantially as described.

7. The combination of an osmium filament and a support for the same, said support composed of a sintered or fritted mixture of ten parts by weight of thorium oxid and one part by weight of magnesia, substantially as described.

In witness whereof I have hereunto signed my name, this 13th day of May, 1901, in the presence of two subscribing witnesses.

CARL AUER VON WELSBACH.

Witnesses:

FELIX KUSCHENITZE,
JOHANN LUX.