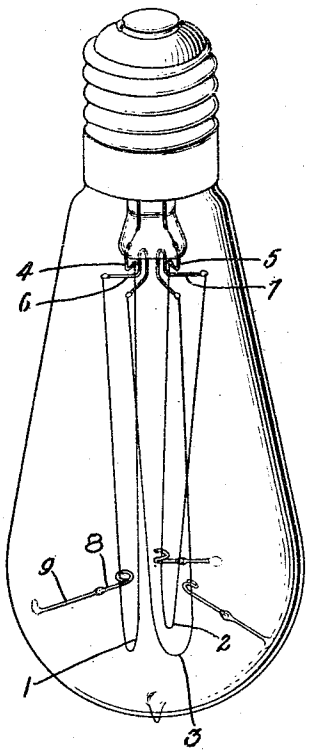
L. GLASER.

HOLDER FOR LAMP FILAMENTS.

APPLICATION FILED MAR. 13, 1907.

1,022,543. Patented Apr. 9, 1912.



Witnesses:

George A. Thornton.

J. Ellis Glen.

Inventor:

Ludwig Glaser,

By Allen Thornton Davis,

Att'y.

UNITED STATES PATENT OFFICE

LUDWIG GLASER, OF BERLIN, GERMANY, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

HOLDER FOR LAMP-FILAMENTS.

1,022,543. Specification of Letters Patent. Patented Apr. 9, 1912.

Application filed March 13, 1907. Serial No. 362,133.

To all whom it may concern:

Be it known that I, LUDWIG GLASER, a subject of the Grand Duke of Saxe-Coburg-Gotha, residing at Berlin, Germany, have invented certain new and useful Improvements in Holders for Lamp-Filaments, of which the following is a specification.

Incandescent lamps with filaments containing tungsten or tungsten-oxygen compounds are manufactured by mixing the filament material with a plastic means such as starch or gum solution and then shaping filaments of proper form therefrom. The plastic binding means is then removed and the filaments, rendered brittle by this treatment, are attached to current conducting wires.

Since a long filament path is necessary for the ordinary potentials of 110 or 220 volts, the individual filament loops must be protected by means of suitable holders or anchors. It is necessary to make these holders from non-conductors since otherwise they might easily cause short circuits. Such holders are made, for example, in osmium lamps, by mixing thoria or thorium oxid with 10 per cent. of magnesium oxid and then pressing the mixture in well known manner into sticks which after forming and firing are inserted as permanent holders in the lamps. Such holders have proven stable at the temperatures at which osmium burns. Since, however, the temperature of tungsten filaments is considerably higher than that of other filaments, the difficulty is encountered that the filament readily becomes fused to such holders or adheres thereto particularly with direct current; if the lamp is cut out of circuit the firmly adhering filament is broken by reason of the contraction caused by cooling.

The drawing accompanying this specification shows one method of using refractory holders in a lamp. The filament path includes the three loops 1, 2 and 3 supported and connected by the leading-in conductors 4 and 5 and the conducting wires 6 an 7. Each of these filaments or loops is held in place by a refractory holder 8 loosely engaging with one leg of the filament and held rigidly in place in any suitable manner as by a glass pedestal 9 fused to the globe of the lamp.

As I have discovered, it is necessary to raise the fusing point of the holders. Holders of pure thorium oxid or of magnesium oxid have proved best.

According to my present invention holders are formed of pure thorium oxid; but as holders made from ordinary thorium oxid are very brittle and have no real stability, the method of manufacture may advantageously be as follows:—Carefully prepared thorium oxid of extreme fineness of grain is employed and the holders are pressed into shape in the usual way. They are then brought to a temperature of at least 2000° C. in a suitable furnace, such for instance as that shown in United States Patent to Arsem, No. 785,535, March 21, 1905. The holders exhibit a brilliant luster on the surface after firing, the luster being apparently due to vaporized material in the furnace used for producing incandescence. This material formed on the surface of the thorium oxid holder is a glaze like compound. Such glazing is best removed by dipping the holder into a mixture of hydrofluoric and sulfuric acid whereby the impurity on the surface is dissolved and the pure thorium oxid remains behind. It is of course possible to proceed in the same manner with holders which are made from mixtures of oxids in order to obtain greater stability. In these likewise there is obtained a surface of pure thorium oxid which does not have the property of adhering to the filament. It is possible to utilize holders of other materials as a core and cover them with pure oxid. The holders may serve as carriers for the filaments in all lamps with high fusion lighting filaments.

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

1. The process of manufacturing holders for filaments, which consists in shaping the holders from refractory oxid, firing said holders to at least 2000° C. and then removing the glaze formed by the firing treatment.

2. The process of manufacturing holders for filaments, which consists in shaping the holders from refractory oxid, firing to at least 2000° C. and dissolving from the surface everything except thorium oxid.

3. The process of finishing oxid filament

holders which consists in firing to at least 2000° C. and then dipping in a strong acid mixture capable of removing from the surface of the holder everything but thorium oxid.

4. A holder of refractory oxid for lamp filaments composed mainly of mixed oxids but having a surface of a substantially pure oxid.

5. A refractory holder for lamp filaments composed of a body of mixed refractory material having a surface of substantially pure oxid more porous than the remainder of said body.

6. A holder for lamp filaments having a surface of substantially pure thorium oxid carried on an oxid core stronger than thorium oxid.

In witness whereof, I have hereunto set my hand this 21st day of February, 1906.

LUDWIG GLASER.

Witnesses:
HANS GELBES,
GUSTAV MATTHIS.