July 7, 1931. F. SCHAEFER ET AL 1,813,320

GASEOUS CONDUCTION LAMP ELECTRODE

Filed Nov. 24, 1928

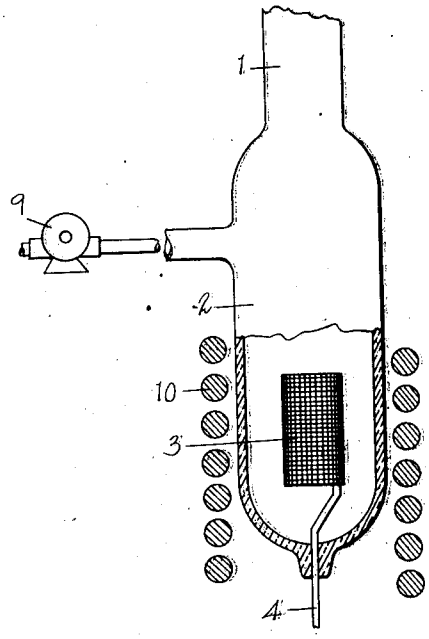


Fig. 1

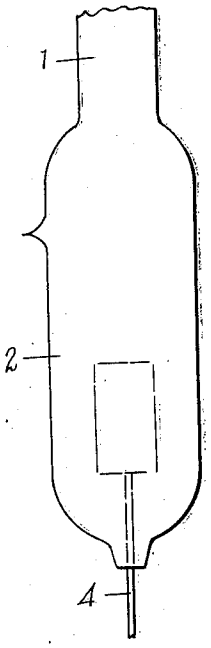


Fig. 4

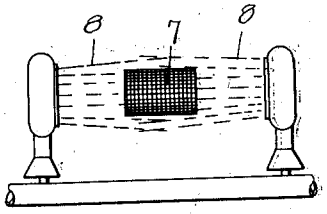


Fig. 3

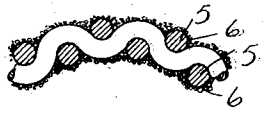


Fig. 2

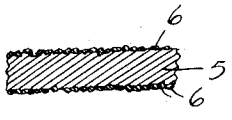


Fig. 5

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UNITED STATES PATENT OFFICE

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GASEOUS CONDUCTION LAMP ELECTRODE

Application filed November 24, 1928. Serial No. 321,606.

The main objects of this invention are:

First, to provide a method of making electrodes for gaseous conduction lamps which are not subject to "sputtering" or "disintegration" in use, even when of relatively small size.

Second, to provide a method of making electrodes for gaseous tube lamps by means of which uniformity of results may be had.

Third, to provide a method of making gaseous conduction lamps by means of which the parts may be very efficiently freed of occluded gases.

Objects pertaining to details and economies of our improvements will appear from the description to follow. The invention is defined in the claims.

The manner of carrying out our improvements is illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary view of a gaseous tube lamp embodying our improvements.

Fig. 2 is a detail section illustrating one of the steps of our improved method.

Fig. 3 is an illustration of a succeeding step, the parts being shown mainly conventionally.

Fig. 4 is a detail view of still another step, the parts also here being mainly shown conventionally.

Fig. 5 is an enlarged fragmentary view of the completed electrode.

Referring to the drawings, 1 represents a gaseous tube lamp and 2 one of the electrode chambers thereof. The electrode 3 is arranged in this chamber and connected to the conduction wire 4.

The electrode 3, which is made in accordance with our improvements, consists of a body or base element 5, preferably a tubular foraminate screen formed of nickel. This screen is coated with or has incorporated therewith a metal of the alkali or alkaline earth groups such as barium, calcium and magnesium, preferably barium, which we have found very highly satisfactory both from the manufacturing standpoint and the standpoint of the resulting product.

When barium is used barium carbonate is suspended in alcohol or melted paraffin and applied to the base 5 in the form of a coating shown at 6, Fig. 2. Either alcohol or paraffin may be employed as a vehicle but in any event it should be such as is capable of elimination by the application of heat, being either evaporated or consumed by the heat.

We preferably eliminate the vehicle by applying to the coated electrode as indicated at 7, Fig. 3, gas flames 8 which are played directly upon the coated electrode. This consumes or evaporates the vehicle and at least partially converts the barium carbonate to barium oxide and metallic barium. In the event the first coating is insufficient for the desired result, successive coatings are applied and subjected to the heat, until the electrode or such portion thereof as is desired, is completely covered with the barium oxide and barium, a portion of the barium being intimately united with the base element.

It will be understood that Figs. 2 and 5 are not intended as accurate illustrations and that no attempt has been made to show the parts in proportions but it is believed these figures will be helpful.

The electrodes thus formed are then sealed within the tube 1 as shown by Fig. 4, the tube being connected to an exhausting pump 9. Heat is applied as by means of the induction heater 10 or other suitable means to further heat the electrodes in vacuo, further converting the barium carbonate into barium oxide and barium and eliminating the gases occluded in the electrodes.

The tube is also heated at this or a later stage to remove the occluded gases therefrom, after which operation the tube is ready to receive such gas or gases as are desired for its operation.

The barium oxide-barium mixture adheres to the surface of the base metal in the form of a porous or spongy or granular layer. The composition and structure of this layer when formed as described above is such that it is not subject to serious disintegration when used as an electrode in gaseous conduction lamps even when the electrodes are of relatively small area.

We are able to produce electrodes of very

uniform quality and to effectively remove the occluded gases therefrom.

Lamps made in accordance with our improved method and embodying our improved electrodes are economical to produce and are of long life.

Having thus described our invention what we claim as new and desire to secure by Letters Patent, is:

1. The method of making electrodes for gaseous conduction lamps consisting of applying barium carbonate to a nickel base element, and heating in an oxidizing atmosphere by subjecting to an impinging flame until a substantial portion of the barium carbonate is converted to barium oxide and fused with a portion of the base element into a homogeneous substance.

2. The method of making electrodes for gaseous conduction lamps consisting of applying an alkaline metal compound to a base element, and heating in an oxidizing atmosphere until a portion of the base element is oxidized and fused with the alkaline earth metal into a homogeneous substance.

3. The method of making electrodes for gaseous conduction lamps consisting of applying an alkaline earth metal compound to a base element, and heating in an oxidizing atmosphere until a portion of the base element and the alkaline earth metal compound is oxidized and fused into a homogeneous substance.

4. The method of making electrodes for gaseous conduction lamps consisting of applying an alkaline earth metal compound to a metal base element, and heating in an oxidizing atmosphere by subjecting to an impinging flame until a portion of the base element and the alkaline earth metal compound is oxidized and fused into a homogeneous substance.

In witness whereof we have hereunto set our hands.

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