Nov. 12, 1935. C. BOL ET AL 2,020,718

ELECTRIC DEVICE

Filed Sept. 28, 1934

313-317

Fig. 1

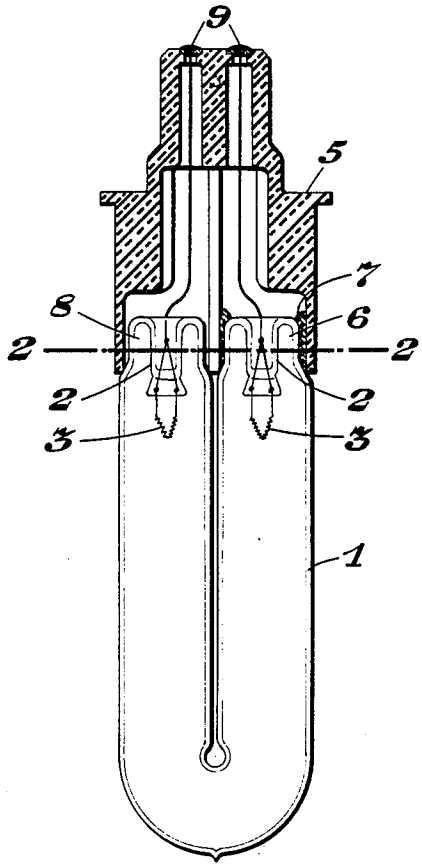
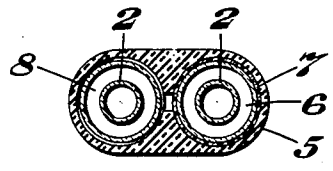


Fig. 2



INVENTORS
Adrianus Linnemans,
Cornelis Bol
BY Harry E. Dunham
ATTORNEY

Patented Nov. 12, 1935

2,020,718

UNITED STATES PATENT OFFICE

2,020,718

ELECTRIC DEVICE

Cornelis Bol and Adrianus Linnemans, Eindhoven, Netherlands, assignors to General Electric Company, a corporation of New York

Application September 28, 1934, Serial No. 746,003
In the Netherlands October 4, 1933

4 Claims. (Cl. 176—122)

The present invention relates to electric devices generally and more particularly the invention relates to electric lamp devices the containers of which are at an elevated temperature during the operation of the lamp, such as gaseous electric discharge lamps.

Bases made of rolled and pressed materials, such as mixtures comprising a condensate of phenol-formaldehyde, are unsuitable for use in connection with lamps operating at an elevated temperature as the material of the base dissociates rapidly under the high temperature operating conditions of the lamp. Bases made of a highly heat resistant material which is easily formed into desired shape, such as asbestos cement, are unsuitable for this purpose because bases made of such materials lack the requisite mechanical strength and absorb moisture at the parts thereof adjacent the electrical contacts which are the coolest parts of the base, being the most remote from the lamp container, during the operation of the lamp. Bases made of intimate mixtures (made by rolling, for example) of the above different materials and formed by pressing the mixture into desired shape, in accordance with the practice when making articles of synthetic resins, are unsuitable as the heat from the lamp causes the base to disintegrate.

The object of the invention is to provide a mechanically strong, high heat resisting, electrically insulating, moisture proof base for electric lamp devices. Another object of the invention is to provide a method of manufacturing such a base for such devices. Still further objects of the invention will be apparent from the following detailed description thereof.

In accordance with these objects the new and novel base comprises a formed body of heat resisting material impregnated with a hardening resin. The new and novel method comprises the steps of first forming a mass of heat-resisting, electrically insulating material of the type used generally in plastics, such as asbestos cement, gypsum cement, burned brick or chamotte, into desired shape and then impregnating the formed body with a hardening resin, such as the products of phenol-formaldehyde; the condensates of urea-formaldehyde or thio urea formaldehyde; glyptals, or shellac. I have demonstrated that the dissociation, if any, of the organic material at the part of the base heated intensively by the lamp does not reduce the mechanical strength of the base below the strength required to support the lamp and that the organic material shielded from the direct heat from the lamp, particularly adjacent the part of the base whereat the electrical contacts are mounted, does not dissociate during the operation of the lamp and prevents the absorption of moisture by the porous, heat resisting material adjacent said contacts and this prevents electrical leakage between said contacts.

Bases having the above structure and made by the above method are particularly useful in connection with gaseous electric discharge vapor lamps the containers of which are maintained at an elevated temperature during the operation of the device in order to maintain the vapor at an effective pressure. This is characteristic of discharge lamps the gaseous atmosphere of which comprises the vapor of a difficultly vaporizable material, such as sodium, magnesium, cadmium, zinc, thallium, rhubidium and caesium.

In the drawing accompanying and forming part of this specification a gaseous electric discharge lamp device having a base made in accordance with the invention is illustrated, in which

Fig. 1 is a front elevational view of the lamp device, the base thereof being shown in section, and

Fig. 2 is a sectional view thereof along the line 2—2 of Fig. 1.

Like numbers denote like parts in both the figures.

Referring to the drawing the gaseous electric discharge lamp device comprises a U-shaped container having a stem 2 at each end thereof and a thermionic electrode 3 mounted on said stem 2. Said container 1 has a gaseous atmosphere therein comprising a mixture of a starting, rare gas, such as neon, at a pressure of 1 to 10 mm. and the vapor of a difficultly vaporizable material, such as sodium. The container 1 is at an elevated temperature during the operation of the device and the vapor therein at an effective pressure at which pressure the light emitted by the lamp is rich in the yellow rays characteristic of sodium vapor.

A base 5 having two cylindrical depressions therein to accommodate the ends 6 and 8 of the container 1 is mounted on said container 1. Said base 5 is fastened on said end 6 by a body 7 of cement or gypsum, the end 8 being left free to move with respect to said base 5 to allow for expansion and contraction of said container 1 under service conditions of the lamp. Said base 5 has two electrical contacts 9 thereon each of which are connected to one of the electrodes 3. The base 5 is of the bayonet type though it will

be understood, of course, that said base 5 is provided with screw threads, when desired. The electrodes 3 are heated by the discharge although, when desired, the number of contacts 9 is increased and a separate heating current is used to heat said electrodes 3.

The base 5 is made as follows: a mixture of one part asbestos, one part of cement and two parts talcum is moistened with water and pressed into the desired shape. The formed article is dried for an appreciable time, preferably four or five days, and is then heated to a temperature of 300° C. to dry it thoroughly. The article in its dried condition is then immersed for approximately 12 hours in an approximately 50% solution of a condensate of a phenol-formaldehyde in alcohol. The article after impregnation, or saturation, is then rinsed superficially with alcohol and placed in a furnace wherein the temperature is raised gradually to 180° C. This heating period is about one and one-half hours. The furnace is then allowed to cool and when cooled the finished article is removed therefrom.

While we have shown and described and have pointed out in the annexed claims certain novel features of the invention, it will be understood that various omissions, substitutions and changes in the forms and details of the device illustrated and in the steps in the method of manufacture thereof may be made by those skilled in the art without departing from the broad spirit and scope of the invention.

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

1. A new article of manufacture comprising a moisture proof formed body of asbestos, cement and talc whose pores are filled with a hardening resin.

2. In combination, an electric discharge device of a type which is adapted to operate at an elevated temperature, and an insulating base therefor which comprises a body of asbestos, cement and talc whose pores are filled with a hardening resin.

3. A method of manufacturing an electrically insulating, heat resisting, moisture proof article which comprises the steps of forming a mass of cement, asbestos and talc, drying the formed article, immersing said formed article in a bath comprising a moisture proof hardening resin to fill the pores in said article, and then baking said article.

4. A method of manufacturing an electrically insulating, heat resisting, moisture proof base for electric lamp devices which comprises the steps of mixing one part of asbestos and one part of cement with two parts talcum, moistening this mixture with water, pressing the mass into desired shape, drying the shaped article, immersing the article in a solution of a condensate of phenol-formaldehyde in alcohol and then baking the article.

CORNELIS BOL.
ADRIANUS LINNEMANS.