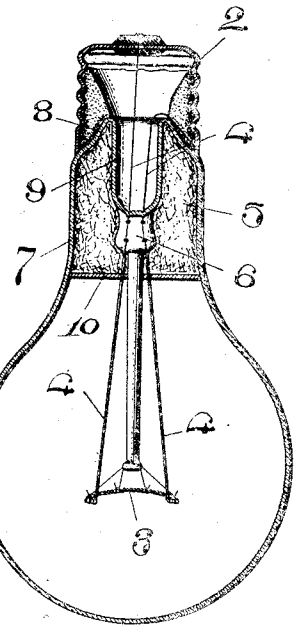
April 17, 1934. E. MUKASA 1,955,510

GAS SEALED INCANDESCENT LAMP OR THE LIKE

Filed Nov. 18, 1931

Fig. 1.



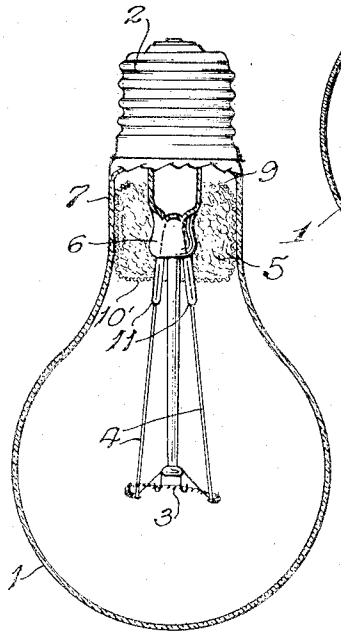




Fig. 2.

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## GAS SEALED INCANDESCENT LAMP OR THE LIKE

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5 Claims. (Cl. 176—16)

My invention relates in general to gas sealed incandescent lamps, and more particularly pertains to that type having inherent characteristic for protecting its base and sealed part against being overheated.

With gas sealed incandescent lamps, it has hitherto been proposed to protect the base against being overheated, for example by a vacuum wall around the neck of the bulb. This prevents the base but not the sealed part, from being overheated; moreover its manufacture is rendered difficult and troublesome.

It has also been proposed to provide a disk made of mica or like material closely fitted inside the neck of the bulb beneath the sealed part, so as to restrict the convection of gas in the lamp bulb below said disk. But inasmuch as the disk is heated by the gas circulating below it at high temperature, the gas above the disk becomes also heated and is caused to circulate above the disk, whereby the base and the sealed part are heated after all. This method, therefore, is not successful and experiments show that it is not practically useful.

According to the present invention said overheating of the base and the sealed part are entirely avoided and the manufacture of the incandescent lamp is rendered easy and economical.

Stated more specifically, it is proposed to fill glass wool or the like material in the space of the neck around the sealed part in the gas filled incandescent lamp, so that the base and the sealed part may be kept perfectly free from being overheated. By diminution of the surface area of the bulb at high temperature, from whence heat is dissipated into atmosphere, watt consumption of the incandescent lamp or other similar means is considerably economized.

In the accompanying drawing Fig. 1 shows a longitudinal sectional view of the incandescent lamp embodying the present invention, Fig. 2 shows a longitudinal sectional view of the modified form.

Referring to Fig. 1 the bulb (1) is provided inside with a filament (3) or electrodes of arc or any other electrically radiating means. Projecting inside the bulb (1) and passing hermetically through the sealed part (6) are the lead wires (4). The base (2) is attached at the top (8) of the neck (7) to which the upper end of the stem tube (9) is connected. Glass wool or the like non-conducting material (5) is filled in the space of the neck (7) around the sealed part (6) and the stem tube (9). A disk (10) made of glass or any other non-conducting material is provided for supporting the glass wool (5) in case of necessity.

Wool glass is a fine and flexible fibre of glass, and provides a highly non-conductive material. It contains no volatile matter, and does not disturb the glass for being fused together in the course of manufacture of the bulb, and even when a part of glass wool is fused together with the glass no harmful effect is brought on the nature of incandescent lamp. Glass wool is therefore, best adapted for the purpose as stated above.

The improved incandescent lamp of the present invention being provided with glass wool or like non-conductive stuffing material in the neck (7), hot gas heated by the filament or any other electrical heat producing means (3) and furiously circulating in the bulb (1) by convection is interrupted, and the base (8) and the sealed part (6) are perfectly protected against being overheated by means of said non-conductive stuffing material.

In the modified form shown in Fig. 2, glass wool (5) is received in a thin metal case or cage (10') in place of a disk (10), closely fitted inside the neck (7). The case (10') may be perforated or made of a fine wire netting. Lead wires (4) are insulated from said case by glass tubes (11). According to this modified form glass wool (5) may be filled into the casing (11') in order to protect the sealed part (6), and the metal case will thus prevent fragments of glass wool from falling into the bulb (1).

Losses of energy in gas sealed lamps are chiefly divided into two kinds. One of which is the heat loss directly radiating from the white heated filament, and the other the heat radiating into the atmosphere by the air coming in contact with the bulb wall heated by the sealed gas in the bulb. With a bulb of ordinary shape, the latter loss is nearly proportionate to the surface area of the bulb. According to the present invention the heated surface of the bulb being diminished by the area of the neck (7), the dissipating heat is saved, and the electric power for keeping the filament or other heat producing means at constant temperature, is considerably economized.

The incandescent lamp of the present invention is produced by merely filling wool glass in the space of the neck so that the manufacture of the lamp is rendered easy without need of a special machine.

Whether the disk (10) or the metal case or cage (10') is provided for supporting the glass wool, the lower side thereof may be a mirror

or be painted white in order to reflect the rays of the filament.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed I declare that what I claim is:—

1. The combination with an incandescent lamp having a gas-filled bulb with a sealed neck portion, leading in wires projecting into the bulb from said sealed neck and electric heat producing means at the inner ends of said wires; of a non-conducting stuffing material filled in the space of said neck surrounding the sealed portion.

2. In an incandescent lamp as described in claim 1, said stuffing material consisting of glass wool, and means supporting the glass wool in the neck space.

3. In an incandescent lamp as described in claim 1, said stuffing material consisting of glass wool, and means supporting the glass wool in the neck space, said means comprising a disk.

4. In an incandescent lamp as described in claim 1, said stuffing material consisting of glass wool, and means supporting the glass wool in the neck space, said means comprising a metal cage.

5. In an incandescent lamp as described in claim 1, said stuffing material consisting of glass wool, and means supporting the glass wool in the neck space, said means comprising a metal cage having a reflecting bottom surface.

EIZO MUKASA.