

March 18, 1924.

E. J. HUNT

1,487,657

GAS FILLED ELECTRIC LAMP

Filed July 10, 1920

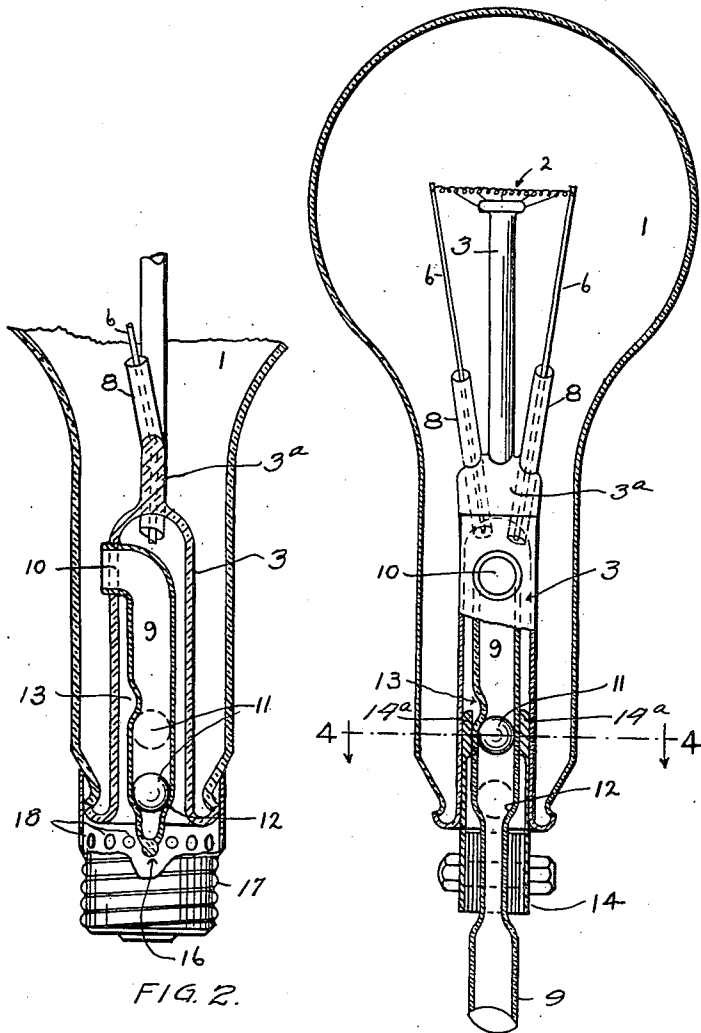


FIG. 2.

FIG. 1.

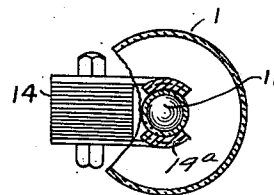


FIG. 4.

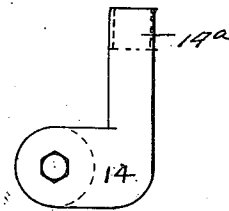
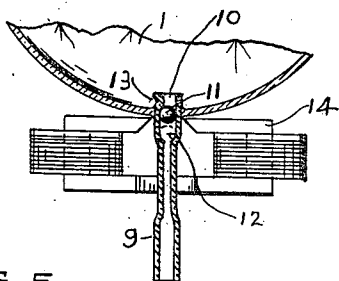


FIG. 3.



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UNITED STATES PATENT OFFICE.

EDWARD JARVIS HUNT, OF NEWARK, NEW JERSEY.

GAS-FILLED ELECTRIC LAMP.

Application filed July 10, 1920. Serial No. 395,255.

To all whom it may concern:

Be it known that I, EDWARD J. HUNT, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Gas-Filled Electric Lamps, of which the following is a specification.

This invention relates to the manufacture and structure of incandescent electric lamps and particularly to a type in which a refractory filament is surrounded by an inert gas.

The main purpose of my invention is to prolong the life of the lamp filament by reducing the evaporation of the filament effected by an increased gas pressure within the lamp bulb. A further object is to provide a simple and effective method of maintaining the pressure in the bulb as the lamp is being filled and finally sealed. Another object is to provide means for preventing short-circuiting between two main leads from a deposit on the glass stem adjacent thereto.

The manner in which these purposes are accomplished is set forth in the following description in connection with the accompanying drawings in which—Figure 1 is a longitudinal sectional view of an incandescent electric lamp embodying my invention; Fig. 2 is a fragmentary longitudinal section of the same taken in a plane at right angles thereto; Fig. 3 is a side elevation of one form of the electro-magnet for holding the ball check valve in the gas inlet; Fig. 4 is a cross sectional view on the line 4—4 of Fig. 1; and Fig. 5 is a fragmentary sectional view showing the tip of the lamp bulb tubulated and provided with a magnetically controlled ball check valve.

The lamp bulb or envelope 1 is provided with a filament 2, mounted as usual upon a glass stem 3 projecting inwardly from the base of the lamp. I surround the inner ends of the lead wires 6 with tubular glass sleeves or sheaths 8 which are sealed in the flattened portion 3^a of the stem. These glass sleeves greatly increase the linear glass surface between the leads on which a deposit must accumulate before an arc-over from one lead to the other can occur.

The gas inlet tube 9, in the form illustrated in Figs. 1 and 2, passes inwardly from the base through the recess or cavity in the stem and terminates in a port 10 opening into the lamp bulb chamber. The outer

portion is contracted to form a seat at 12 for a metal ball check valve 11, which is confined in its upward travel by an indentation in the tube at 13.

When the outer end of the tube 9 has been connected to an exhausting apparatus, the check valve 11 may be unseated and lifted into the position shown in Fig. 1 and in dotted lines in Fig. 2, by means of an electro-magnet 14 which may be supported upon the tube 9 or in any suitable manner, the poles 14^a being located adjacent the indentation 13 which serves as a stop for the ball. In this position the ball does not completely close the bore of the tube and the air may be exhausted from the bulb. Thereafter, when it is desired to introduce gas into the bulb, the magnet is deenergized to permit the ball valve to drop down upon the seat 12. Gas under pressure may then be forced through the tube lifting the valve slightly during its passage, but cannot escape outwardly since the seating of the valve completely closes the tube.

After the bulb has been filled with an inert gas, such as nitrogen or argon, to the desired pressure, the magnet is removed and the tube is sealed off as indicated at 16, in Fig. 2, the escape of gas during the sealing operation being substantially prevented by the ball check and there being no pressure beyond the valve to interfere with making the seal.

The walls of the stem are preferably made of heavy glass capable of withstanding great gas pressure while the walls of the gas inlet tube or windpipe 9 are made of glass which is thinner than that of the stem and of the walls of the bulb so that any break which might perchance occur would take place at this weakest point, thereby relieving the pressure in the direction of the screw shell 17, which may be provided with a plurality of openings 18 to afford a free escape for the gas.

Instead of exhausting the bulb and introducing the inert gas through the base of the lamp, the tip of the bulb may be provided with an exhaust and gas inlet tube 9, as indicated in Fig. 5.

I claim:—

1. An incandescent electric lamp, comprising an envelope or bulb, a filament mounted therein, a gas-filling tubulure adapted to be sealed within the lamp structure, and a check-valve of magnetic material,

permanently enclosed in the sealed tubulure adjacent the sealing point and adapted to automatically close the bore of said tubulure.

2. An incandescent lamp, comprising an
5 envelope or bulb, a filament mounted therein, said envelope being filled with an inert gas under pressure and hermetically sealed, and a check-valve of magnetic material
10 mounted within the envelope and positioned to seat over the sealing point.

3. An incandescent electric lamp, comprising an envelope or bulb, a stem extending inwardly from the lamp base, a filament mounted upon said stem, a gas-filling tube

extending through a portion of said stem 1
and opening into the lamp chamber, a check-valve of magnetic material mounted within
said tube and adapted to close the bore
thereof when seated, said tube projecting
outside of the lamp base to form a connec- 2
tion for exhausting the filament chamber
and for filling it with an inert gas, and
means for holding the valve open during the
exhausting operation and permitting it to
seat while the tube is being sealed. 2

In testimony whereof I affix my signature.

EDWARD JARVIS HUNT.