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GAS-FILLED ELECTRIC LAMP WITH A GAS-DIRECTING SCREEN

Filed March 20, 1961

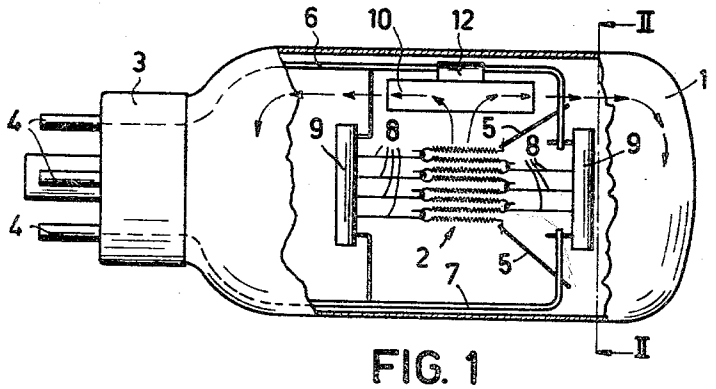

FIG. 1

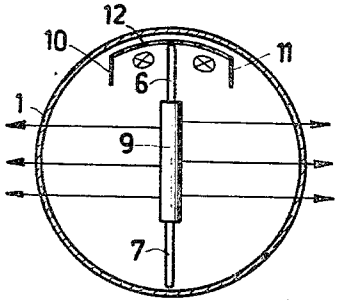

FIG. 2

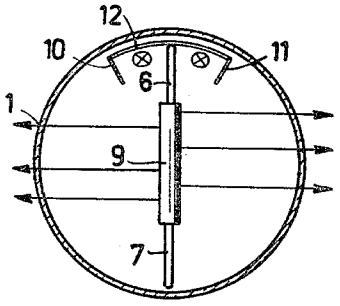

FIG. 3

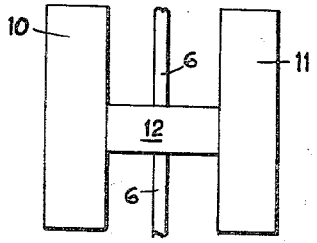

FIG. 4

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GAS-FILLED ELECTRIC LAMP WITH A GAS-DIRECTING SCREEN

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3 Claims. (Cl. 313—33)

The invention relates to a gas-filled electric incandescent lamp which is used in a burning position in which the longitudinal axis of the substantially cylindrical bulb is arranged horizontally, and a screen system for guiding the gas current occurring in the lamp bulb during operation is provided in a zone which lies higher than the filament.

Hitherto, this screen system has been arranged above the filament at a given distance from the upper bulb wall and shaped in a form such that the gas ascending along the filament flows downwards along the side walls substantially in planes at right angles to the longitudinal axis of the bulb.

These side walls extend in the direction of the optimum emission of light and radiation of the incandescent lamp. Consequently, they are thermally loaded very heavily.

The invention is characterized by a screen system guiding the gas flow parallel to the longitudinal axis and along the upper side of the bulb. The flow of gas heated by the filament then comes into contact with only part of the bulb wall, which part is loaded least by the light emission and the radiation emission.

The screen system may comprise at least two strips extending in the longitudinal direction of the bulb and being located on both sides of the vertical plane passing through the longitudinal axis, the upper sides of which strips are situated at a small distance from the adjacent bulb parts, the arrangement being so that the passage through the screen strips has a considerably smaller gas resistance than the passage through the gaps adjacent the upper sides of the screen strips.

In this case, the planes through the screen strips may intersect each other in a line lying in or below the longitudinal axis and extending parallel to the latter.

The invention will be described more fully with reference to the accompanying drawing, in which are shown a few embodiments of the invention.

FIGS. 1 and 2 show a view and a cross-section of a projection lamp according to the invention.

FIG. 3 shows a modification of the screen system of this lamp.

FIG. 4 is a top plan view of the screen system.

The lamp shown in a horizontal burning position according to FIGS. 1 and 2 comprises a gas-filled horizontally arranged and substantially cylindrical bulb 1 fabricated of a transparent material which surrounds a filament 2 and is provided with a conventional lamp cap 3 having axial current supply pins 4.

The filament consists of horizontal pieces of wire arranged above each other and wound bihelically, which pieces are electrically connected in series with each other and through conductors 5 and stay wires 6 and 7 to two of the pins 4. The transition areas between the pieces of wire are connected through wires 8 on both sides of the filament with glass rods 9 which are supported by the stay rods 6 and 7. The direction of the optimum emission of light and radiation is in the center of the filament at right angles to the plane of FIG. 1.

On both sides of the vertical plane of symmetry of the lamp (see in particular FIG. 2), screen strips 10 and 11 are arranged close to the upper part of the bulb and extending in the longitudinal direction of the bulb. These strips prevent the heated gases ascending along the filament, after they have arrived at the upper part of the bulb, from flowing back laterally and in planes at right angles to the longitudinal axis of the bulb along its cylindrical side walls.

Between the strips 10 and 11, there is a passage having a very low resistance to the gases so that the latter, after having arrived at the upper side of the bulb, start flowing along the upper generatrices of the cylindrical bulb part in a horizontal direction and do not descend until they have reached the ends of the bulb. Consequently, the gases circulate in planes at right angles to the direction of the optimum emission along bulb parts which are least loaded by the radiation.

The screen strips 10 and 11 may be connected with each other and with the stay wire 6 by means of a strip 12 bent over parallel to the upper bulb wall. A suitable material for the screen system is, for example, nickel having a thickness of about 0.25 mm. The screen strips 10 and 11, which should make the gas flow very resistive to circulation in planes parallel to the direction of the optimum emission, or in other words: in planes at right angles to the longitudinal axis of the bulb, therefore have to be rather compact, that is to say, they should show relatively few apertures or openings. This consideration does not hold for the connecting strip 12 so that the latter may show more apertures or may be replaced by a few wires.

According to FIG. 2, the screen strips 10 and 11 are in a vertical position. They may, however, also be arranged diverging upwards, as is illustrated in FIG. 3, the planes of these strips intersecting each other approximately in the longitudinal axis of the cylindrical bulb.

By way of example, it may be stated that the bulb of the lamp shown in FIGS. 1 and 2 filled at room temperature with argon having a pressure of about 700 mms. has a diameter of about 40 mms. and a length of about 70 mms. The filament 2 was proportioned for a consumption of energy of about 500 W at an operational temperature of about 3200° K. The screen strips 10 and 11 consisted of nickel gauze of about 25 x 5 mms. They were arranged at a distance of 17 mms. from each other and about 0.5 mm. from the bulb wall. The connecting strip 12 was constituted of nickel gauze and its dimensions were approximately 17 x 17 mms.

With this lamp, a lifetime of about 25 operational hours, which is normal for projection lamps of this type, was reached without disturbing blistering of the bulb wall occurring.

What is claimed is:

1. A gas-filled incandescent lamp which in its operating position is located with its longitudinal axis substantially horizontal; comprising a bulb, a filament in said bulb, electrically conducting stay wires supporting said filament, and a screen system for said filament having depending, solid screen strips at opposite sides thereof and a solid connecting part therebetween, said screen strips extending axially in said bulb and located on opposite sides of a vertical plane passing through said longitudinal axis of said lamp and said connecting part extending substantially parallel to the upper bulb wall, the upper ends of said screen strips being a relatively small distance from the adjacent bulb and forming a gap therebetween whereby the passage between the screen strips has a considerably smaller gas resistance than the passage through said gap adjacent to the upper ends of the screen strips.

2. A gas-filled incandescent lamp which in its operating position is located with its longitudinal axis substantially horizontal; comprising a bulb, a filament in said bulb,

electrically conducting stay wires supporting said filament, and a screen system for said filament having depending, solid screen strips at opposite sides thereof and a solid connecting part therebetween, said screen strips being angularly displaced relative to said screen to thereby converge inwardly, said screen strips extending axially in said bulb and located on opposite sides of a vertical plane passing through said longitudinal axis of said lamp and said connecting part extending substantially parallel to the upper bulb wall, the upper ends of said screen strips being a relatively small distance from the adjacent bulb and forming a gap therebetween whereby the passage between the screen strips has a considerably smaller gas

resistance than the passage through said gap adjacent to the upper end of the screen strips.

3. A gas-filled incandescent lamp as claimed in claim 1 wherein said screen strips are parallel to said longitudinal axis of said lamp.

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