

[54] **ELECTRIC GAS-DISCHARGE LAMP**

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[56] **References Cited**

**UNITED STATES PATENTS**

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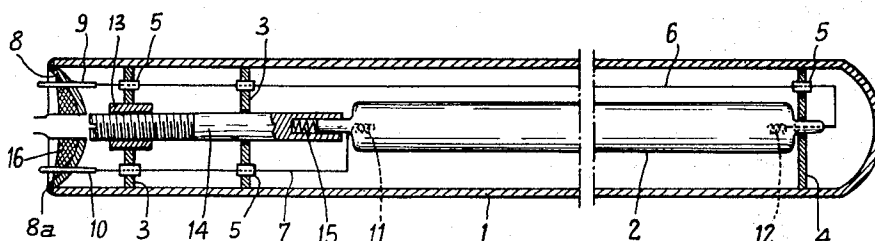
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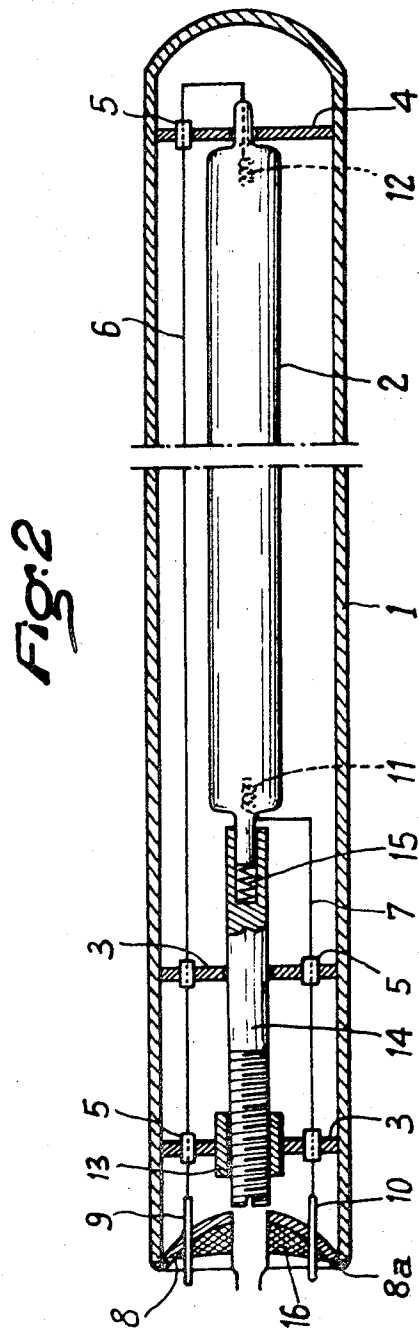
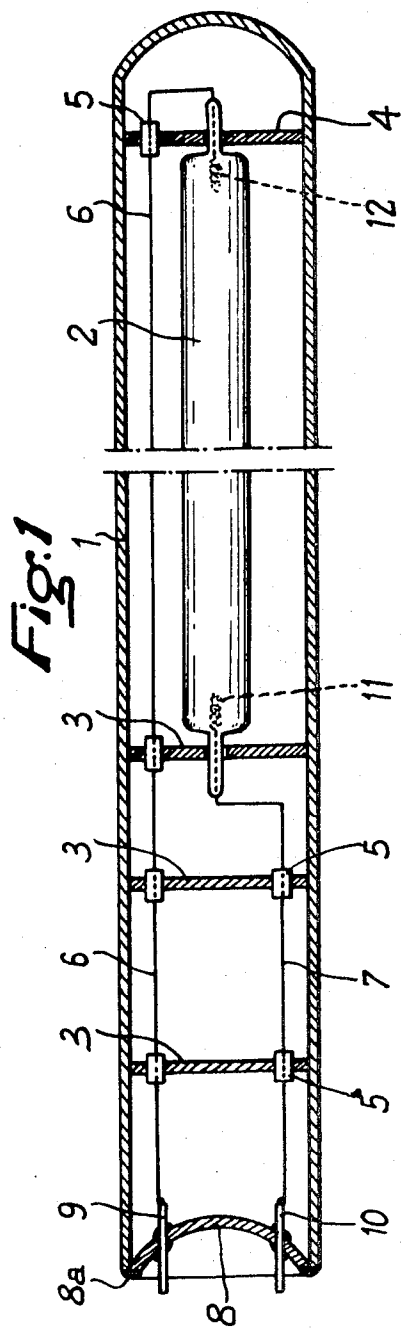
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**ABSTRACT**

An electric gas-discharge lamp consisting of an elongated burner filled with a volatilizable substance and with an electrode at each end, and a tube surrounding this burner, characterized in that the elongated tube has at least one concave end section, this lamp, when it is excited, emitting light the wavelength of which depends of the substance with which the burner is filled.

**2 Claims, 2 Drawing Figures**





## ELECTRIC GAS-DISCHARGE LAMP

The present invention concerns new gas-discharge lamps.

Existing electric gas-discharge lamps make use of a burner consisting of a transparent container into which a quantity of a volatilizable substance is introduced, with two electrodes projecting into it, conveying electric voltage from an outside source; this burner being enclosed in a tube, also transparent, through which pass the conductors connecting the electrodes and the voltage source. The annular space between the tube and burner contains either a primary vacuum or a neutral gas, such as nitrogen, under some pressure. The burner is held inside the tube by cross-struts, so that it has some play along its axis, causing mechanical stresses in the tube which can break it. A glazier's lathe is needed to repair the tube, which means that the lamp is out of service for several days.

The present invention allows manual fitting of the tube and moderate lengthwise tightening of the burner, allowing it to expand, but holding it in place and thus preventing stress on the tube.

The electric gas-discharge lamp according to the present invention consists of an elongated burner, filled with a volatilizable substance and with an electrode at each end, and a tube surrounding it, and is characterized by the fact that the elongated tube has at least one concave end section.

In one embodiment, this concave section includes an evacuation tube (a glass tube used to create a vacuum inside a lamp before closing it), and a rod of adjustable length rests on the struts supporting the burner, holding it steady inside the tube and thus preventing mechanical damage to the lamp.

In one recommended embodiment, the burner is held in position lengthwise by a fixed strut and by the rod, which is adjustable lengthwise, and which carries a spring at the end in contact with the burner.

It will be easier to understand the invention from the description below of one embodiment, illustrated by the accompanying figures.

FIG. 1 shows a cross-sectional view of a lamp according to the invention.

FIG. 2 shows the same lamp, equipped with an attachment rod.

In FIG. 1, the tube 1 encloses the burner 2, which is a quartz cylinder, greater in length than in diameter. This cylinder is supported by struts such as 3 and 4, which hold it in the center of the tube 1. These struts contain insulating passages such as 5, through which pass electrical conductors 6 and 7. These are connected to the electrodes 11 and 12, at opposite ends of the burner. The tube 1 is closed at one end by a concave surface 8, made from the same material as the tube, and containing two tungsten-pyrex, tungsten-

quartz or molybdenum-quartz passages 9 and 10 connected to the conductor wires 6 and 7. This concave surface replaces the convex section normally used, and it has the advantage, for assembly of the lamp, of being able to be fitted into the end of the tube, with the edges of the tube and of the concave part being positioned together in such a way as to make manual welding of the two parts possible.

This has the very important advantage of making a glazier's lathe unnecessary for the welding operation. Centring is done automatically, and the two parts can be joined together along juncture 8a with a conventional blow-lamp.

FIG. 2 shows a more highly perfected embodiment. Components common to FIGS. 1 and 2 carry the same references.

In this embodiment, the concave section 8 contains a central glass tube, opposite which inside the tube is a rod 14, with a threaded section which passes through a nut 13 on one of the struts 3. At the end of the rod facing the glass tube there is a slot, allowing it to be turned with a screwdriver. At the other end of the rod is a socket in which can be fitted a spring 15, which also presses against the end of the burner 2. The rod and the nut holding it are inserted before the concave section 8 is fitted, and they wedge the burner inside the tube 1. When the concave section has been welded in place, the rod 14 can be tightened with a screwdriver so as to block the burner properly. The spring 15 at the end of the rod presses against the burner and allows for its thermal expansion. Once this has been adjusted, the annular space is either emptied to create a vacuum, or filled with nitrogen, and the evacuation tube at the end is welded to close it. The concave section of the lamp is also filled with resin 16, to cement the quartz-metal or pyrex-metal electrical passages 9 and 10.

What we claim is:

1. An electric gas-discharge lamp consisting of an elongated burner, filled with a volatilizable substance and with an electrode at either end, struts supporting said burner, an elongated tube surrounding said burner and having at least one concave end section, the concave section including an evacuation tube, and a rod of adjustable length resting on the struts supporting the burner, holding it steady inside the tube and thus preventing mechanical damage to the lamp.

2. An electric gas-discharge lamp consisting of an elongated burner, filled with a volatilizable substance and with an electrode at either end, struts supporting said burner, an elongated tube surrounding said burner and having at least one concave end section, the burner being held in a fixed position by one of the struts which is fixed and by a rod, which is adjustable lengthwise, which is supported by another strut, and which has a spring at the end in contact with the burner.

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