

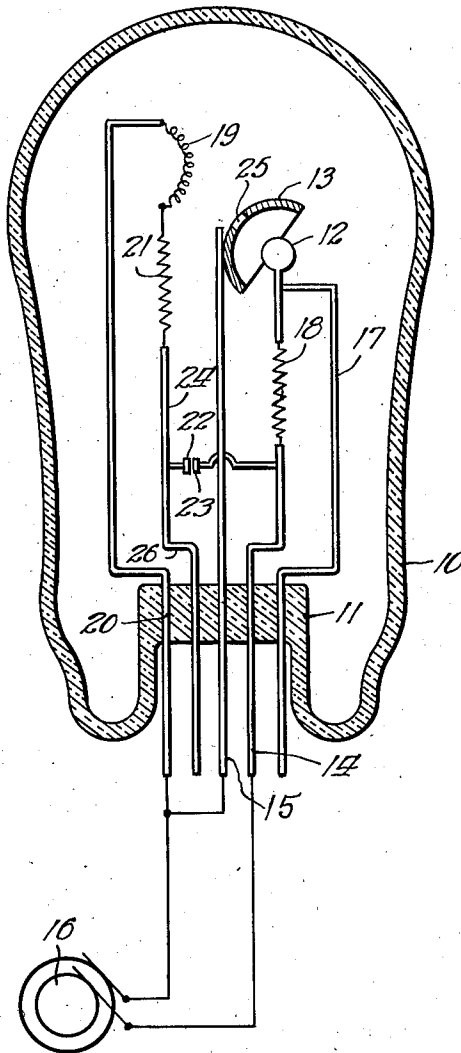
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PROJECTION LAMP

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UNITED STATES PATENT OFFICE

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PROJECTION LAMP

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My invention relates to projection lamps and has for its object the provision of an improved lamp of this character.

In the preferred embodiment of this invention I utilize a vacuous tube in which two electrodes are provided, one of which is preferably hollow and the other of which is placed at or near the focus of the hollow electrode. The path of the discharge takes place between these two electrodes.

I find it desirable, in the preferred form of the invention, to take auxiliary ionizing means to initially assist in the ionization of this discharge path.

I will describe one form of the invention more in detail by referring to the accompanying drawing which illustrates somewhat diagrammatically my invention, certain parts being drawn in section.

In the drawing I show a vacuous tube made of glass or similar material. I have not thought it necessary to show the base structure for this tube as any suitable form can be used. This glass tube is provided with an in-turned stem 11 which carries the supports for certain instrumentalities. Two instrumentalities which are carried by this base are the electrode 12 and the electrode 13. The electrode 12 consists preferably of a tungsten or tantalum ball about .060"—.070" diameter. The electrode 13 is preferably made of molybdenum or tantalum and is preferably shaped in a rounded or parabolic form, thus constituting what I might call a hollow electrode.

The electrode 12 is placed substantially at the focus of the hollow electrode 13. A discharge is adapted to be maintained between these electrodes when the device is normally operating. The device itself is adapted to be energized by the normal 110 volt circuit either alternating current or direct current.

The electrodes 12 and 13 are connected by lead-in wires 14 and 15 with a suitable source of current 16 as shown diagrammatically. A stem 17 serves rigidly to hold the electrode 12

in its proper relationship to the electrode 13, a resistance 18 serving to limit the current flow between the electrodes 12 and 13.

Now in order to secure a prompt and effective initial ionization of the path between the electrodes 12 and 13, I provide auxiliary ionizing means in the form of a filament 19, one terminal of which is connected by means of the lead-in wire 20 to the same terminal of the source of current to which the lead-in wire 15 is connected. The other terminal of the filament 19 is connected through a high resistance 21 to one terminal 22 of a thermal control device having a complementary element 23. The other terminal of the resistance 21 is mounted upon a stem 24 mounted in the stem 11 of the tube. The electrode 13 has a small cutaway portion shown herein as the hole 25, which is directly in the path between the electrode 12 and the filament 19.

The complementary thermal element 23 is rigidly supported on and electrically connected to the stem 14. When the device is not in operation, the elements 22 and 23 are in contact. The stem 24 has a horizontal portion 26 which is made of a metal having a high co-efficient of expansion. The elements 22 and 23 are preferably made of silver.

Now when the current is initially turned on to the device, a difference of potential is established across the electrodes 12 and 13 and current also passes through the filament 19. The filament is thus heated to incandescence. In the claims I use the words "heating the filament to incandescence", meaning of course, such heating as is required to cause the emission of electrons. The filament may be coated with an activating substance, thus lowering the temperature to which it must be heated in order to bring this about. The filament being thus heated throws off electrons which tend to travel toward the electrode 12 whereby the path between the electrodes 12 and 13 is ionized and a discharge takes place between these electrodes.

After the device has operated a predetermined initial period of time, the element 26 is sufficiently heated so that its expansion will separate the elements 22 and 23 whereupon the current to the filament is cut out, its
5 ionizing influence no longer being required as the arc once established between the electrodes 12 and 13 will continue and maintain itself. The heat of the device itself is then
10 sufficient to maintain the element 26 in its expanded condition.

One of the main purposes of this projection lamp device is to secure a light of comparatively great candle power concentrated over
15 a very small area. It will be clear from the illustration, that the tungsten ball operating at a white heat generates rays of great actinic power. With the parabolically shaped reflector behind it, an enormous concentration
20 of light rays can be obtained within a restricted small area.

Such a light would be serviceable for the projection of moving pictures, microscopic examination, stereoscopic slides, etc. Due to
25 the fact that there is a large emanation of ultra-violet and infra-red rays, this device would be useful in conjunction with therapeutic work. The device is small and can be readily manipulated. A quartz rod, for instance,
30 could be held against the glass directly in front of the glowing tungsten ball and the other end of the rod directed against the infected areas in the mouth, the throat and in the regions of the soft palate. Other uses will
35 readily suggest themselves.

From what has been thus described, the nature of my invention will be readily clear to those skilled in the art and it will also be clear that many modifications may be made
40 from the structure herein shown without departing from the spirit of the invention.

Having, however, thus described one of its forms, what I claim as new and desire to secure by Letters Patent is:

45 1. A device of the character described comprising a vacuum tube, electrodes therein adapted to be the terminals of a discharge, auxiliary ionizing means in said tube to assist
50 in preliminary ionization of said discharge path, and means in said tube adapted after the initial period of said discharge to render said auxiliary ionizing means inoperative, one of said electrodes being provided with a
55 concave parabolic reflecting surface and the other of said electrodes being at substantially the focus of said concave electrode.

2. A device of the character described comprising a vacuum tube, electrodes therein adapted to be the terminals of a discharge,
60 auxiliary ionizing means in said tube to assist in preliminary ionization of said discharge path, and means in said tube adapted after the initial period of said discharge to render said auxiliary ionizing means inoperative, one of
65 said electrodes being hollow and having a

parabolic shaped interior surface and the other of said electrodes being at substantially the focus of said hollow electrode, said hollow electrode having a cutaway portion in the path extending between the other electrode and said auxiliary ionizing means.

In witness whereof, I hereunto subscribe my name this 6th day of September A. D., 1928.

RICHARD E. MIESSE.