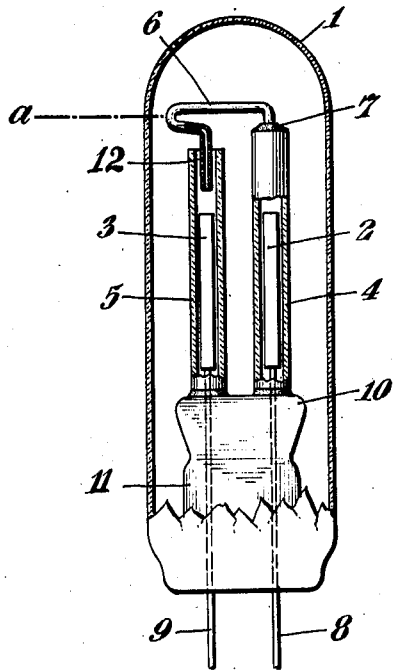
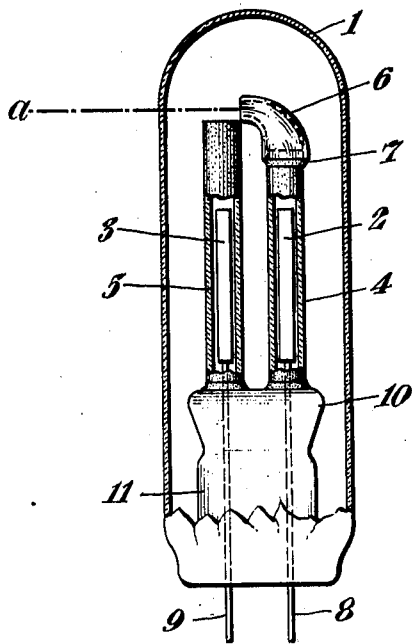


NEON LAMP FOR TELEVISION

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Fig. 1.

Fig. 2.



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NEON LAMP FOR TELEVISION

Application filed November 26, 1929. Serial No. 403,805.

My invention relates to luminescent tubes and more particularly to devices of this type which are adaptable for use as television lamps and in sound reproduction in connection with motion pictures.

In the copending application of Zons and Albert, Serial No. 367,690, there is described and claimed a type of luminescent tube in which a discharge tube of small diameter is enclosed within a larger tube containing a quantity of neon, argon or other gas which becomes luminescent when a charge of electricity is passed through it. In the tube mentioned the small enclosed discharge tube is perforated permitting the gas contained in the large enclosing reservoir tube free access thereto; but when the current is passed between the electrodes, which are within the smaller tube, the luminescence is confined to the channel of the smaller tube.

The present invention employs some of the instrumentalities of the invention of the aforesaid application but applies them in such a manner as to utilize the quick conduction of the neon gas and the brilliancy of the arc to the end that a very brilliant beam may be directed in a desired direction. The invention will be more clearly understood from the drawings in which:

Fig. I represents the preferred form of the invention; and

Fig. II represents an alternative form.

Referring now to Fig. I, 1 is an envelope such as a glass bulb, 2 and 3 are electrodes preferably of a type described and claimed in my copending application Serial No. 367,690. These electrodes are insulated from each other by sleeves, 4 and 5, made of silica, quartz, porcelain or other suitable insulating material. In Fig. I, these sleeves are broken away to show the electrodes, 2 and 3, within them and it will be noted that the sleeves are much longer than their enclosed electrodes. It will also be observed that the sleeve, 4, is somewhat shorter than the sleeve 5. Sleeve, 4, is, however, surmounted by an elbow member, 6, which may be of quartz, pyrex or the like, cemented to it by the cement joint, 7. The elbow, 6, bends at right angles towards and preferably touching the lip of sleeve, 5. Lead

wires, 8 and 9, sealed through a press, 10, of a stem 11, as in an ordinary incandescent lamp connected with an external source of electrical current not shown.

The bulb, 1, is filled with one of the rare gases such as neon, helium, argon, krypton or xenon, or with mixtures of these highly conductive gases at a suitable pressure. Where certain color effects are desired mercury vapor may also be mixed by adding a drop of mercury within the bulb. When current is turned on, a discharge takes place from electrode, 2, through sleeve, 4, and bending through the elbow, 6, passes into sleeve, 5, to electrode, 3. Accordingly when the beam is thrown from the opening of the elbow in the direction of the dotted line to the eye of an observer at *a* is of very great intensity for at that position the eye is looking lengthwise of the arc.

Fig. II utilizes the same principle of presenting this longitudinal beam to the desired spot but less perfectly than Fig. I. The indicating numbers in the drawings show the same arrangement of electrodes, 2 and 3, in their sleeves, 4 and 5, and connected with an external source of electrical current by the leads, 8 and 9, sealed through the press 10 of the stem, 11. A very important difference lies, however, in that for the elbow, 6, of Fig. I, a capillary tubing, 6, of pyrex, silica, or the like, bent into the form of a rather sharp V is substituted. This capillary tube, 6, is sealed to the sleeve, 4, by the cement, 7, but is merely inserted into the upper end of sleeve, 5, at 12, and not sealed there. The gas enclosed within the bulb, 1, has, therefore, free access to both electrodes through the opening at 12 in the manner described in the application of Zons and Albert, Serial No. 367,690, hereinabove referred to.

Accordingly in the form of the device shown in Fig. II the discharge passes from one electrode to the other through the capillary, 6, and the eye positioned at *a* looking along the dotted line to the point of V shaped capillary, 6, perceives a very brilliant point of light. The beam so thrown from the capillary, 6, of Fig. II, is somewhat less brilliant than that thrown from the elbow, 6, of Fig. I.

I, for the reason that the V shaped capillary does not present the arc in exactly a longitudinal beam along the line *a*.

5 In using the device for a television lamp the beam along the line *a* should be directed to the televisior and the glass bulb of the lamp may be mirrored or otherwise obscured except at the point where this beam passes through the glass. At this point a window
10 may be left open.

Having thus described my invention what I claim is:—

1. A glow discharge vacuum tube comprising an envelope; electrodes operatively supported therein; and means for guiding the
15 glow discharge comprising tubes, one for each electrode, said tubes containing the electrodes at one end and being open-mouthed at the other end, the mouths of said tubes being
20 juxtaposed to deliver into each other, one of said tubes having a portion thereof adjacent its mouth directed endwise to the wall of the container so that the glow discharge therein is viewable end-on through said wall.

2. A glow discharge vacuum tube comprising an envelope; electrodes operatively supported therein; and means for guiding the
25 glow discharge comprising tubes, one for each electrode, said tubes containing the electrodes at one end and being open-mouthed at the other end, the mouths of said tubes being
30 juxtaposed to deliver at right angles into each other, the mouth of one of said tubes being directed to the wall of the container so that the glow discharge therein is viewable end-on
35 through said wall.

3. A glow discharge vacuum tube comprising an envelope; electrodes operatively supported therein; and means for guiding the
40 glow discharge comprising adjacent tubes, one for each electrode, said tubes containing the electrodes at one end and being open-mouthed at the other end, the free end of one of said tubes consisting of a straight length
45 of tubing extending transversely over to the other tube with the mouths of said tubes brought into juxtaposition to deliver into each other, said transversely extending straight
50 length of tube being directed endwise toward the wall of the container so that the glow discharge therein is viewable end-on through said wall.

4. The glow discharge vacuum tube of any of the preceding claims further characterized
55 by the envelope being non-transparent to the glow discharge except for a transparent spot in line with said discharge when viewed end-on as aforesaid.

In witness whereof, I have subscribed my
60 name hereto this 30th day of October, 1929.

FREDERICK W. ZONS.