

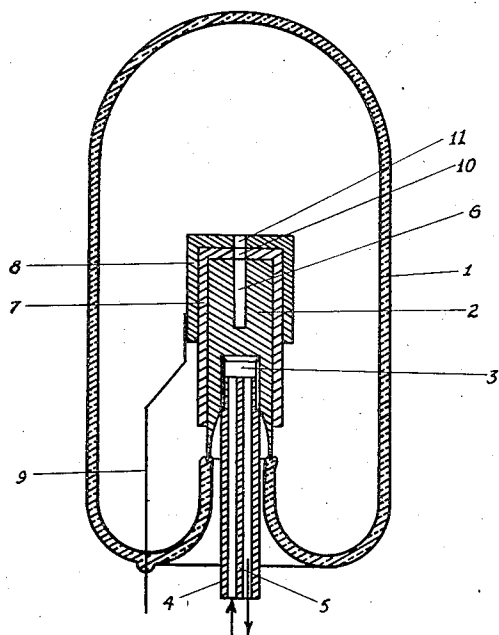
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ELECTRIC GLOW DISCHARGE TUBE

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ELECTRIC GLOW DISCHARGE TUBE

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This invention relates to an electric glow discharge tube adapted for translating electrical current variations into light variations. Glow discharge tubes of this type are frequently used in apparatus for receiving images which are transmitted by telegraphy or by wireless, for example, in television apparatus.

When using glow discharge tubes of this type often the difficulty is encountered, that they shine afterward, i. e., on variations of the current traversing a discharge tube the intensity of the emitted light cone does not directly vary to the same extent as the current. On weakening of the current the luminous intensity still conserves its former value for a short time.

The present invention has for its purpose to obviate this afterglow.

In a glow discharge tube according to the invention the cathode forms part of the wall of the discharge tube. The afterglow seems to be favourably affected by a good cooling of this cathode. Since the cathode forms part of the wall of the discharge tube it is rendered possible to cool the cathode artificially in a simple manner. To this effect preferably the outer wall of the cathode is provided with a cavity through which a cooling liquid may be passed. If the cavity is provided with a screw thread then a tube serving for the supply of the cooling liquid, which preferably by means of a partition is divided into two passages, may be screwed therein.

Due to the intensive cooling of the cathode the afterglow is reduced and in addition a strong current may be lead through the discharge tube, so that the intensity of the emitted light may be raised.

The invention will be more clearly understood by reference to the accompanying drawing, representing, by way of example, one embodiment thereof.

The discharge tube illustrated comprises a wall 1 consisting of glass or similar material to which a metal body 2 consisting, for example, of ferrochromium is sealed. The outer wall of this body 2 comprises a cavity 3 which is provided with a screw thread by

means of which the tube 4 may be fixed to the metal body 2. By means of a partition 5 this tube 4 is divided into two passages, so that the tube 4 may serve for supplying and carrying off a cooling liquid.

The metal body 2 constituting the cathode of the glow discharge tube is provided with a deep and narrow recess 6 and is surrounded by a cap 7 of insulating material, for example, quartz. This insulating envelope is surrounded in its turn by an electrically conducting cap 8 likewise consisting, for example, of ferrochromium and connected to the leading-in wire 9 which is taken out through the wall of the discharge tube. The current may be supplied to the cathode through the metal tube 4. The envelope 7 and the cap 8 are provided with bores 10 and 11 registering with the excavation 6 of the cathode.

The discharge tube is provided with a gaseous filling preferably consisting of one or more rare gases, for example helium at a pressure of 15 millimetres. One or more metal vapours may be added to the gaseous filling, which is often advisable in order to act upon the spectrum of the light emitted by the discharge tube. If the tube contains mercury vapour, for example, then ultraviolet rays will be generated by the discharge. If the wall of the discharge tube consists of a material which is transparent to ultraviolet rays, for example, uviol glass or quartz these rays will emerge from the wall of the discharge tube.

When applying a suitable tension between the cathode 2 and the anode 8 a negative glow discharge is produced between these electrodes. The luminous phenomena will be substantially concentrated in the recess 6 of the cathode. It has been found that the variations of the current passed through the tube is very quickly followed by the luminous intensity, so that the afterglow of the discharge which may be very annoying when using the discharge tube, is obviated. Moreover, since the heat produced by the discharge is quickly carried off, the intensity of the current, passed through the tube may be given a comparatively high value, due to

which the intensity of the emitted light cone is raised.

Having now described my invention, what I claim and desire to secure by Letters Patent is the following:

A glow discharge device comprising a gas filled envelope, a cathode member having at one end a cavity extending internally thereof, tubular members secured within the cavity through which cooling liquids are supplied to and carried away from the cathode, said cathode also having at its opposite end a tubular recess extending internally thereof for a substantial portion of its longitudinal length, a layer of insulating material surrounding the outer portion of said cathode for substantially the entire longitudinal length thereof and also having an aperture coinciding in location with the said tubular cathode recess, and an anode member provided as a cap portion surrounding said insulation layer and having a recess coinciding in location with both the cathode tubular recess and the insulation layer aperture whereby upon the application of a potential difference between the anode and cathode members a glow discharge is produced which is observable in the direction of the longitudinal recess in the said cathode member.

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