

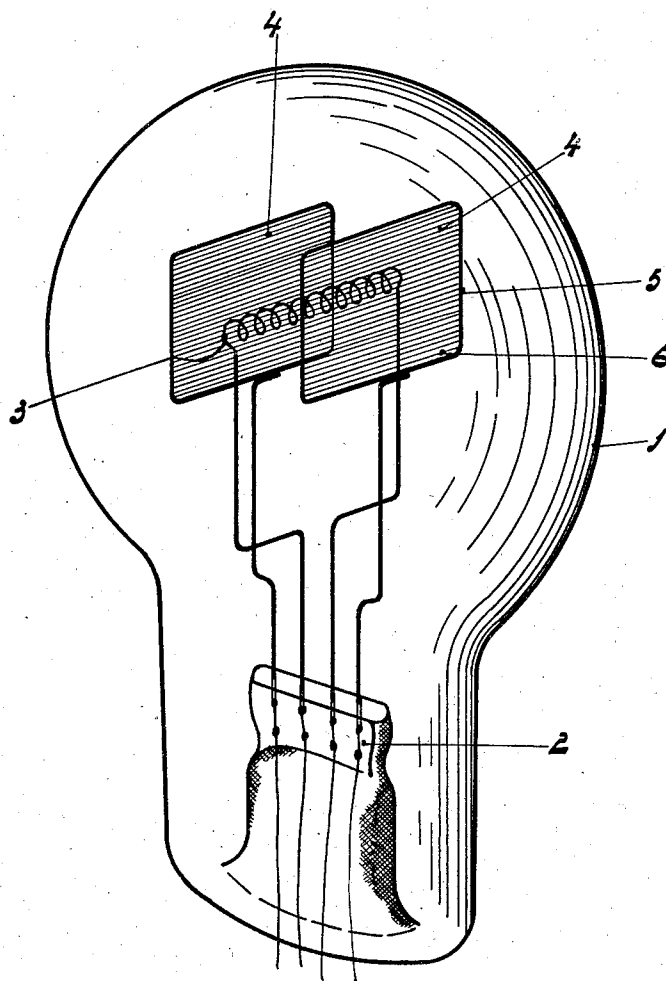
Nov. 12, 1935.

G. ZECHER

2,020,715

ELECTRIC ARC DISCHARGE TUBE CONTAINING A GAS OR A VAPOR

Filed Oct. 21, 1930



Inventor:
Gustav Zecher
by Lee B. Kewen
his Attorney

UNITED STATES PATENT OFFICE

2,020,715

ELECTRIC ARC DISCHARGE TUBE CONTAINING A GAS OR A VAPOR

Gustav Zecher, Eindhoven, Netherlands, assignor,
by mesne assignments, to General Electric
Company, a corporation of New York

Application October 21, 1930, Serial No. 490,262
In the Netherlands January 9, 1930

4 Claims. (Cl. 176—126)

This invention relates to an electric gas or vapor-filled arc discharge tube for the emission of rays comprising an incandescent cathode and one or more anodes. Discharge tubes of the kind are frequently used for the emission of ultra-violet rays and for this purpose the tubes generally comprise a mercury vapor atmosphere.

After long use these discharge tubes often have the disadvantage that the cathode partly disintegrates, the disintegrating particles of material being precipitated on the wall of the tube. The layer of disintegrating particles of material formed on the wall renders difficult the issue of the rays to be emitted and causes a considerable decrease in efficiency of the discharge tubes.

The invention has for its object to construct a discharge tube of the kind referred to so as to obviate the above mentioned disadvantages.

For this purpose, an electric arc discharge tube according to the invention for the emission of rays being filled with gas or vapor or a mixture thereof and comprising an incandescent cathode and one or more anodes has one or more anodes formed by grid-shaped members. It has been found that these grid-shaped anodes attract the disintegrating particles of material and prevent the blackening of the wall of the discharge tube so that the transparency of the wall of the tube to the rays to be emitted is not decreased during operation or only to a very slight extent. The discharge tube has the additional advantage that the anodes allow the passage of the luminous rays to be emitted and thus assist a uniform distribution of the light.

In order that the invention may be clearly understood and readily carried into effect one form of discharge tube according to the invention will be described with reference to the accompanying drawing.

The electric discharge tube shown in the figure is adapted for the emission of light, for example of ultra-violet rays, and for this purpose it is provided with a wall of material transparent to such rays, for example of uviole glass or quartz. The pinch 2 sealed to the wall of the tube carries three electrodes viz. an incandescent cathode 3 and two anodes 4. The incandescent cathode is formed by a helically wound wire, for example a wire of tungsten, which may be coated with a film of substances of high electron emission, for example thorium or oxides of alkaline earth metals. The anodes are constituted by a frame 5 on which a wire 6 is wound into the form of a grid. Obviously, the anodes may be constituted by grid shaped members built up in a different manner and may be made, for example, of pieces of gauze. Alternatively, they may have a bent shape,

The tube contains mercury vapor and for this purpose one or more drops of liquid mercury may have been inserted into the discharge tube. In addition to the mercury vapor the tube contains a supply of gas which may, preferably, be a rare gas, for example argon. The pressure of this gaseous filling may have various values and is preferably low, for example of the order of several millimeters, or less, of mercury pressure.

The particles disintegrating from the cathode during the operation of the tube are precipitated on the grid-shaped anode so that any blackening of the wall of the discharge tube and any decrease of the transparency of the wall to the rays generated in the tube are avoided.

What I claim is:

1. An electric discharge device comprising a container, electrodes sealed therein, a gaseous atmosphere therein, at least one of said electrodes being a cathode, other of said electrodes being grid-shaped anodes interposed between said container and said cathode to screen out of the path of the light radiations emanating from the electric discharge in said gaseous atmosphere the particles of light absorbing disintegrated cathode material in said light path.

2. An electric discharge device comprising a container, electrodes sealed therein, a gaseous atmosphere therein, at least one of said electrodes being a cathode, other of said electrodes being grid-shaped anodes interposed between said container and said cathode to collect the particles of light absorbing disintegrated cathode material passing in the direction of the glass wall of said container.

3. An electric discharge lamp comprising a container, electrodes sealed therein, a gaseous atmosphere therein, at least one of said electrodes being a cathode, other of said electrodes being parallel grid-shaped anodes interposed between said container and said cathode to intercept the particles of light absorbing disintegrated cathode material passing in the direction of the glass wall of said container.

4. An ultra-violet generator comprising a container, electrodes sealed therein, a gaseous atmosphere therein rich in ultra-violet and other light, at least one of said electrodes being a cathode, other of said electrodes being parallel grid-shaped anodes interposed between the walls of said container and said cathode to intercept the particles of light absorbing disintegrated cathode material passing in the direction of the wall of said container.

GUSTAV ZECHER.