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[21] Appl. No. **889,600**

[22] Filed **Dec. 31, 1969**

[45] Patented **June 29, 1971**

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[32] Priority **Jan. 8, 1969**

[33] **Germany**

[31] **P 19 00 765.9**

[51] Int. Cl. **H01J 61/18**

[50] Field of Search..... **313/184,**
225, 229

[56] **References Cited**

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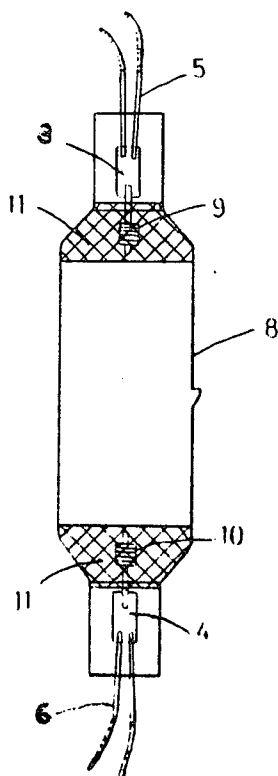
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[54] **ADDITIVE-TYPE HIGH-PRESSURE MERCURY-VAPOR DISCHARGE DEVICE HAVING GOOD ULTRAVIOLET OUTPUT**
4 Claims, 1 Drawing Fig.

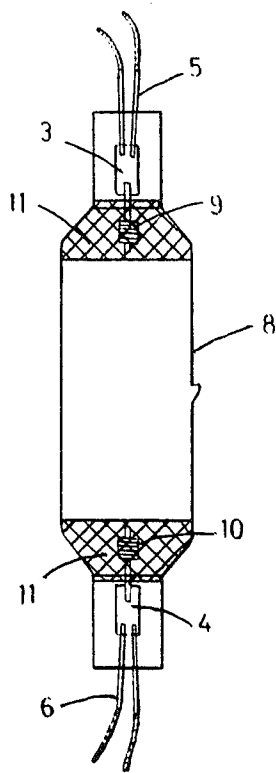
[52] U.S. Cl. **313/184,**
313/225, 313/229

ABSTRACT: A high-pressure mercury-vapor discharge device having improved ultraviolet output and maintenance of initial output during operation comprise a radiation-transmitting arc tube having a fill consisting of inert ionizable starting gas, a predetermined charge of mercury, iron, halogen (preferably iodine) as required to react with the iron to form ferrous halide, and stannic halide (preferably the iodide).



PATENTED JUN 29 1971

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ADDITIVE-TYPE HIGH-PRESSURE MERCURY-VAPOR DISCHARGE DEVICE HAVING GOOD ULTRAVIOLET OUTPUT

BACKGROUND OF THE INVENTION

The usual-high-pressure mercury-vapor discharge device comprises an arc tube which encloses an inert ionizable starting gas and a predetermined fill of mercury which is completely vaporized during operation of the device. It is known to incorporate additive halides in such a device to improve the output thereof. It is desirable for some applications, such as therapeutic use, to improve the ultraviolet output as well as the so-called maintenance of initial operation for such devices.

SUMMARY OF THE INVENTION

In accordance with the present invention in addition to the usual inert starting gas and mercury, the arc tube contains an additive of Fe and Sn-halide. Operation of the device is particularly good when the additive is composed of an amount of from 0.01 to 1 mgr./cc., preferably 0.03 mgr./cc. of metallic Fe, an amount of halogen equivalent to the Fe-(II)-halide, and from 0.006 to 0.06 mgr./cc., preferably 0.06 mgr./cc. of Sn-(IV)-halide, preferably Sn-iodide.

BRIEF DESCRIPTION OF THE DRAWING

Referring to the drawing which shows an exemplary embodiment of the present invention, the sole FIG. illustrates a discharge device fabricated in accordance with the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The FIG. shows an embodiment of the radiator according to the invention. Each end of the discharge tube 8 of quartz glass is provided with a vacuum-tight foil seal 3, 4 whereby the mandrel wires of electrodes 9, 10 of well-known activated refractory material are connected to the lead-in wires 5, 6. The ends of radiation transmitting tube 8 are provided with a reflecting coating 11 of ZrO_2 . The discharge tube 8 has an inner diameter of 20 mm., the electrode spacing is 48 mm., and the volume is about 16 cc. The discharge tube 8 is filled with

about 30 mgrs., of Hg., 0.5 mgr. of metallic Fe and an amount of iodine equivalent to the Fe-(II)-halide, 1 mgr. of Sn-(IV)-iodide, and with 20 Torr of argon as the basic inert ionizable starting gas. The arc tube is operated from 3.5 amps. and 125 v. and a loading of 400 w. The mercury is present in predetermined amount and completely vaporizes during operation of the device.

The spectrum of a radiator with an arc tube filled with Hg. and Fe-halide is hardly affected by the present addition of Sn-iodide. However, the substantial advantage resulting from the Sn-iodide is that the inevitable decrease of UV-radiation output during operational life of the radiator is considerably reduced. Thus the UV-radiation output is, for example, still constant after more than 100 hours of operation. Compared to a similar conventional mercury lamp without any halide additive, the overall output is increased and, moreover, the relative proportion of ultraviolet radiation in the range of wavelengths from 315 nm. and 380 nm. to the range of wavelengths from 280 nm. to 315 nm. is increased.

We claim as our invention:

1. A high-pressure mercury-vapor discharge lamp of the additive type and having improved ultraviolet output and improved maintenance, said device comprising a radiation-transmitting arc tube of predetermined volume and electrodes operatively disposed proximate the ends thereof, said arc tube having a fill consisting of inert ionizable starting gas, a charge of mercury in predetermined amount which is completely vaporized during operation of said device, a predetermined amount of iron, a predetermined amount of halogen as required to form ferrous halide with said iron, and a predetermined amount of stannic halide.

2. The device as specified in claim 1, wherein said iron is present in amount of from 0.01 to 1 milligram per cc. of arc tube volume, said halogen is present in amount as required to form ferrous halide with said iron, and said stannic halide is present in amount of from 0.006 to 0.6 milligram per cc. of arc tube volume.

3. The device as specified in claim 2, wherein said halogen is iodine and said stannic halide is stannic iodide.

4. The device as specified in claim 3, wherein said iron is present in amount of about 0.03 milligram per cc. of arc tube volume, said iodine is present in amount as required to form ferrous iodide with said iron, and said stannic iodide is present in amount of about 0.06 milligram per cc. of arc tube volume.

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