Nov. 14, 1933. H. A. WAYRINGER 1,935,423

ELECTRIC DISCHARGE DEVICE

Filed Jan. 28, 1929

Fig. 1.

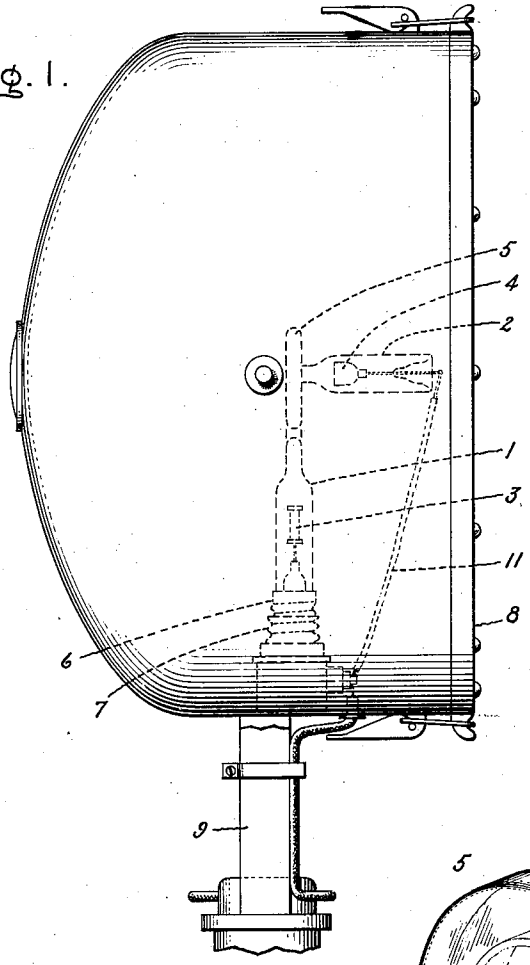


Fig. 2.

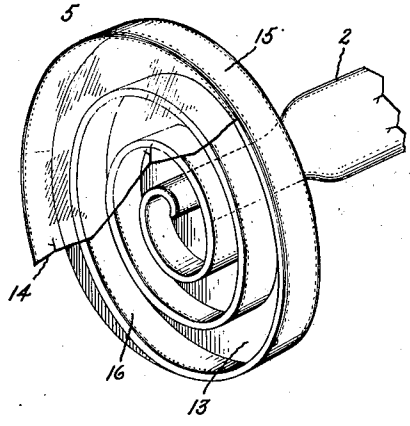
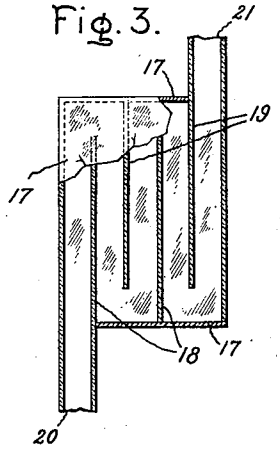


Fig. 3.



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ELECTRIC DISCHARGE DEVICE

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6 Claims. (Cl. 176—122)

The present invention relates to gaseous discharge devices, such, for example, as lamps containing neon, mercury vapor, or other gas, and its object is to provide a continuous tube coiled upon itself having a single wall thickness whereby a concentrated light source may be provided.

Heretofore, when concentrated gaseous discharge lamps have been desired, a tubular envelope has been coiled upon itself to form a compact body.

The coiling up of a tube, when consisting of a refractory glass, or fused quartz, is a tedious and difficult operation and the completed article has two wall thicknesses as well as idle space between adjacent turns or loops of the luminous discharge.

In accordance with my invention a more efficient construction is provided for a luminous unit which not only is more easily fabricated but which also is less bulky and has but a single wall between adjacent turns. The novel features of my improved construction are pointed out with particularity in the appended claims but in general my invention makes use of a container having partition walls forming sinuous passages therein.

The accompanying drawing shows in Fig. 1 in side elevation a projector containing a lamp embodying my invention; Fig. 2 is a perspective on a large scale of an improved lamp, part of the lamp structure being broken away, and Fig. 3 is a fragmental view of a modification.

Referring to the drawing, and in particular to Figs. 1 and 2, the lamp shown comprises electrode chambers 1 and 2 containing respectively a cathode 3, and an anode 4 of any approved type and an intermediate communicating, illuminating tube or chamber which is coiled upon itself to form a flat disc 5. The cathode end of the lamp is provided with a base 6 which may be screwed into a socket 7 within a projector 8, this forming no part of my invention.

The projector 8, carried by a pedestal 9, is provided wtih a mirror (not shown) opposite the lamp. It has been shown only to illustrate one particular use of a lamp embodying my invention. Current is conveyed to the anode by conductor 11 and to the cathode (which may be thermionic and of known construction) by conductors connected to the terminals of the socket 7 and not illustrated.

The novel features of my invention are particularly concerned with the construction of the illuminating portion of such a lamp, as illustrated in greater detail in Fig. 2. The illuminating chamber 5 comprises plates 13, 14 of fused quartz (or silica) which are united by a side wall 15 to form an enclosure which communicates with the electrode chamber 2 as indicated and with the electrode chamber 3 at a peripheral portion which has been broken away. Within this enclosure is a transverse partition 16 which forms within the chamber a sinuous or spiral passageway leading from one electrode chamber to another.

In the fabrication of this structure, the partition 16 first is formed by coiling a ribbon of the desired vitreous material, for example, fused quartz, upon itself into a spiral or other desired form. This ribbon is then fused to one of the plates 13 or 14 by means of a blow pipe, arc, or other suitable means. The plate 13 may be placed over the spiral 16 which rests on a suitable refractory support, such as graphite, and the flame is directed upon the plate at the line of contact of the plate and the partition to produce a fusion seal and firm union between the two. The remaining plate 14 then is joined similarly by fusion to the side wall 15 and the partition 16 to form a gas-tight enclosure or panel of transparent material.

It is not essential that the device comprising my invention should be formed of members of the particular shape illustrated in Fig. 2. In Fig. 3 there is illustrated an embodiment of my invention having flat angular enclosing walls 17 and flat partition plates, one set 18 of which is connected to one of the end plates, and another set 19 is connected to the opposite end plate, thereby leaving a sinuous passage or labyrinth communicating with the conduits 20, 21 leading to the electrode chambers at the ends of said passage, which have not been illustrated in this figure.

The luminous unit made as herein described when filled with a gas which becomes luminous while conducting an electric current forms a substantially continuous luminous field suitable for use in electric signs, in projectors or other illuminating devices.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. An electric discharge device comprising plates spaced apart, side walls sealed thereto to constitute an enclosure, one or more transverse partitions arranged between said plates to form a sinuous passage in said enclosure, the adjacent portions of which are separated by a single wall, and means for conducting an electric discharge through said passage.

2. An electric discharge device comprising plates of vitreous silica spaced apart, one or more side walls sealed thereto, a spiral partition sealed to said respective plates, chambers communicat-

ing with the passage formed by the convolutions of said partition and electrodes in said chambers adapted to conduct an electric discharge through said passage.

3. An electric lamp comprising a container, electrodes therein and a partition arranged therein to form a continuous, single-walled tube coiled upon itself.

4. An electric lamp comprising an envelope of vitreous material, a plurality of partitions sealed to opposite wall members of said envelope and being arranged to form therein a continuous single-walled sinuous passage, a gaseous material in said envelope and means for conducting an electric discharge through said passage.

5. A luminous unit for electric signs or the like, comprising a panel of transparent material having a single-walled, convolute partition therein arranged to define a passage forming a substantially continuous, uniformly luminous field when filled with a luminous gas, a conductive luminous gas in said passage and electrodes for said gas on the panel at the ends of said passage.

6. An electric lamp comprising an envelope of transparent material having a convolute partition therein which is arranged to form a compact passage the adjacent portions of which are separated by a single wall, a gaseous filling therefor, electrodes including a thermionic cathode spaced apart in said passage, and conductors sealed into said envelope and being connected to said electrodes.

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