Feb. 28, 1950 W. T. POSEY 2,499,197

METAL ENVELOPE ELECTRIC DISCHARGE DEVICE

Filed Nov. 24, 1948

Fig. 1.

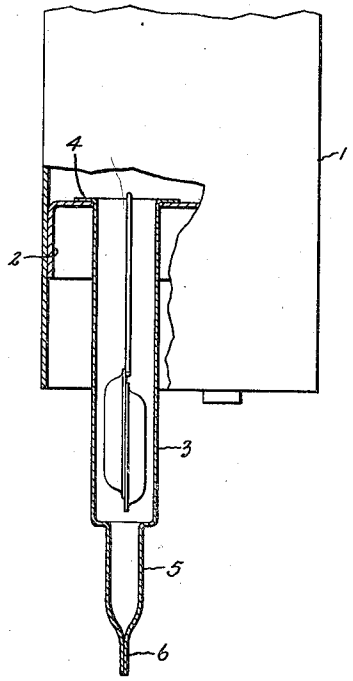


Fig. 2.

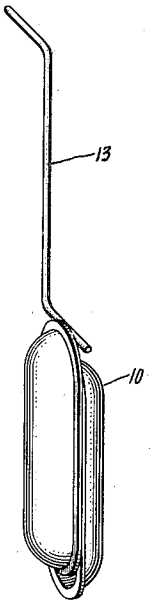


Fig. 3.

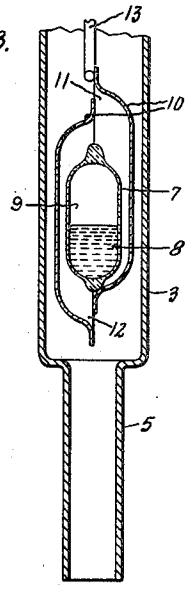
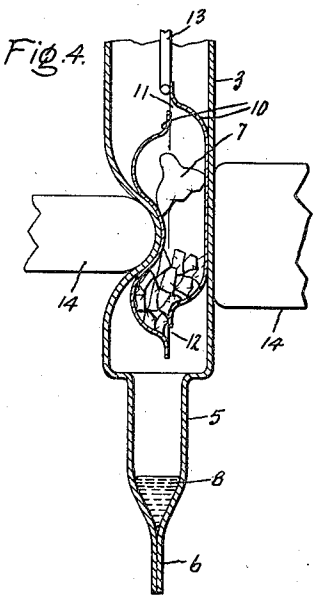


Fig. 4.



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UNITED STATES PATENT OFFICE

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METAL ENVELOPE ELECTRIC DISCHARGE DEVICE

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3 Claims. (Cl. 250—27.5)

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My invention relates to metal envelope electric discharge devices of the type employing an ionizable medium and, particularly, to an improved construction for facilitating the charging of such devices with a predetermined quantity of ionizable medium.

It has been customary to introduce an ionizable medium, such as mercury or a gas or a combination of the two, into discharge devices having a glass envelope by placing an ampule containing the medium within the envelope in such a position that it may be shattered by high frequency induction at a desired time in the processing of the device. It is not possible to do this for metal envelope discharge devices due to the complete shielding action of the metal envelope. Automatic injection apparatus has been provided on exhaust machines for supplying the ionizable medium to discharge devices of this type and, while this method has in general been satisfactory, it materially increases the cost of manufacture and the complication of the exhaust machines. In accordance with an important aspect of my invention, I provide a novel construction which permits charging of metal envelope devices with a predetermined quantity of ionizable medium by shattering an ampule containing the medium by mechanical deformation of a part of the envelope.

The objects and advantages that characterize my invention will become more apparent as the following description proceeds, reference being had to the accompanying drawing in which Fig. 1 is an elevational view, partially in section, of a metal envelope device embodying my invention; Fig. 2 is an enlarged perspective view of a supporting structure for the ampule as employed in the device of Fig. 1; Fig. 3 is an enlarged elevational view, in section, of the tubulation of the device of Fig. 1 prior to sealing off; and Fig. 4 is a similar enlarged elevational view after sealing off and after the ampule has been shattered by deformation of the tubulation.

Referring now to the drawing, I have shown my invention as employed in a metal envelope type discharge device including a generally cylindrical metal envelope 1 which is closed at its lower end by an inverted cup-shaped metal header 2 which is bonded, as by welding, to the lower end of the envelope 1. An elongated metal tubulation 3 communicates with the interior of the envelope 1 through the header 2 and is joined to the header by an outwardly extending flange 4 which is preferably welded to the inner surface of the header. The tubulation is provided at its lower extremity with a portion 5 of reduced cross section which, in the complete tube, is welded together at its lower end, as indicated at 6. As shown in Fig. 3, a glass ampule 7 containing a quantity of mercury 8 and, if desired, also a quantity of gas 9 is housed by and supported within the tubulation by a pair of opposed hollow metal members 10 which are joined together in longitudinally offset relationship to provide openings 11 and 12 through which the ionizable medium may readily escape upon shattering of the ampule 7. The support and enclosure thus formed are supported in that portion of the tubulation extending below the tube envelope 1 by a wire 13 which is bonded to one of the members 10 and to the flange 4 of the tubulation.

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The tubulation is in the form shown in Fig. 3 while exhaust of the device takes place. After exhaust is complete, the lower end of the tubulation is sealed off, as shown at 6 in Figs. 1 and 4. Subsequently, the tubulation is deformed by suitable dies 14 in the region of the ampule 7 to reduce the cross section of the tubulation sufficiently to shatter the ampule and release the ionizable medium. The openings 11 and 12 are sufficiently small to retain most of the glass within the casing formed by the metal parts 10.

In the interest of simplifying the drawing, the electrodes of the device have not been illustrated. It will be appreciated that when the invention is applied to a thyratron having a metal envelope that an anode, a control grid and a thermionic cathode will be supported within the envelope in mutually insulated relation.

It will be apparent from the foregoing description that the present invention provides a very simple structure making it possible to introduce the ionizable medium within metal envelope devices by means of an ampule and that the shattering of the ampule by a mechanical deformation of the tubulation is easily and positively accomplished.

While I have shown and described my invention by reference to a particular embodiment thereof, it will of course be understood that I do not wish to be limited thereto since various modifications may be made, and I contemplate by the appended claims to cover any such modifications as fall within the true spirit and scope of my invention.

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

1. An electric discharge device of the type utilizing an ionizable medium comprising a metal envelope, a metal tubulation extending from said envelope, a frangible ampule containing a quan-

tity of ionizable medium supported within said tubulation so that said ampule may be shattered and said medium liberated by deformation of said tubulation.

2. An electric discharge device of the type utilizing an ionizable medium comprising a metal envelope, a metal tubulation extending from said envelope, a perforated deformable support in said tubulation, a frangible ampule containing a quantity of ionizable medium within said support so that said ampule may be shattered and said medium liberated by deformation of said tubulation.

3. An electric discharge device of the type utilizing an ionizable medium comprising a metal envelope closed at one end by a header, a metal tubulation extending from said header and beyond the sidewall of said envelope, a deformable support positioned in said tubulation and having an opening therein, a frangible ampule containing a quantity of ionizable medium positioned within said support so that said ampule may be shattered and said medium liberated through said opening by deformation of said tubulation and said support.

WILLIAM T. POSEY.

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The following references are of record in the file of this patent:

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