

Jan. 31, 1933.

R. H. SINDEN

1,895,867

GETTER CAPSULE

Filed Nov. 30, 1929

FIG. 1

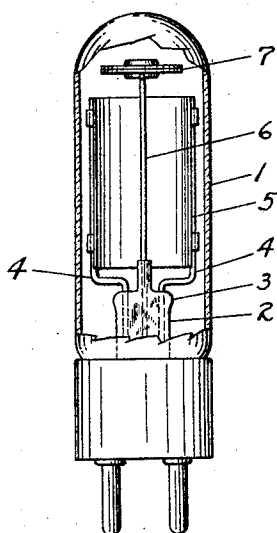


FIG. 2

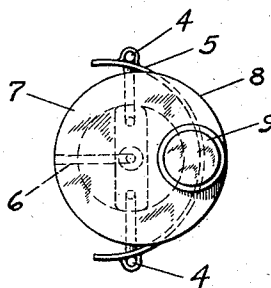


FIG. 4

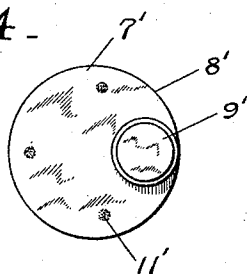
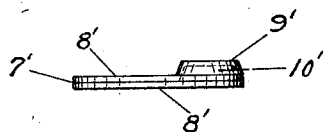


FIG. 5

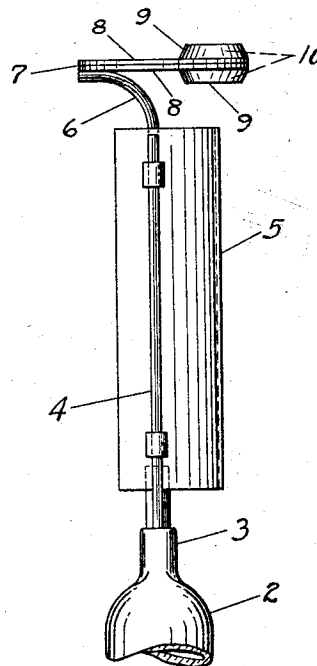


FIG. 3

INVENTOR
R. H. SINDEN

BY *M. F. Reyes*
ATTORNEY

UNITED STATES PATENT OFFICE

ROGER HULL SINDEN, OF CALDWELL, NEW JERSEY, ASSIGNOR TO WESTINGHOUSE LAMP COMPANY, A CORPORATION OF PENNSYLVANIA

GETTER CAPSULE

Application filed November 30, 1929. Serial No. 410,695.

The present invention relates to getter capsules for electrical discharge devices such as radio vacuum tubes, photo-electric cells and related devices.

5 Getter capsules are used extensively in connection with the above mentioned devices to enclose a getter material, or chemicals which will liberate the getter material under the action of heat, and dispense the material to the interior of the tube.

10 Getter capsules of the disc type in common use comprise two pieces of thin metal such as nickel secured together so as to enclose the material between the pieces, one piece having a struck-out portion to afford a container for the material. In the manufacture of the disc type capsules it is the practice to dispose the struck-out portion at the center of the pieces and spot weld the pieces together at spaced points around the margin thereof. The capsule is then mounted in the tube, the tube exhausted, and if desired the metal parts therein freed from occluded gases by high frequency induction heating means, the capsule heated by the same means to liberate the getter material into the interior of the tube to combine with the residual gases remaining in the tube and in some instances to regulate the cathode drop of the tube.

30 Considerable difficulty has been experienced, especially when a chemical compound of the getter and a reducing agent are employed, in heating the capsule sufficiently to effect the chemical action and liberate the getter from the capsule without heating other parts to undesirably high temperatures.

One object of my invention is to provide an improved construction of getter capsule which will enable the same to be manufactured readily and at the same time provide a capsule which may be heated to effect complete reduction of the chemicals therein and liberate the getter without the application of an excessive amount of heat.

A further object of my invention is to so construct a capsule that the material which liberates the getter will be disposed at the more strongly heated portion of the capsule.

According to my invention, I form my improved capsule from two metal pieces at least one of which has a struck-out portion adjacent its margin to form a container for the getter material or the chemical compound of the getter material and a reducing agent. The pieces are secured together over the getter material by spot welds at suitable points or by other desired fastening means. With this arrangement I am enabled to dispose the getter material in that portion of the capsule that will be heated more intensely than other parts of the capsule. This is due to the fact that a disc or any flat metal body heated by induction is heated unequally in different parts due to the eddy currents induced therein, the central portion being heated less than the margin portions. Placing the getter containing portion at the margin also provides for the control of the point at which the capsule will rupture so the getter may be liberated and deposited at desired portions of the tube, the rupture occurring at the point where the margin of the struck-out portion and discs coincide.

In the drawing Fig. 1 is a side elevational view of a disc capsule embodying my invention, applied to a photo-electric cell; Figs. 2 and 3 are a top, plan and side elevational views on an enlarged scale of parts shown in Fig. 1, the views being taken at 90° from the position shown in Fig. 1.

Figs. 4 and 5 are top, plan and side elevational views of a modified form of capsule embodying my invention.

Referring to Figs. 1, 2 and 3 an embodiment of my invention is shown applied to a photo-electric cell which comprises an envelope 1 having a reentrant stem 2, a press 3 of said stem sealing in leading-in and support wires 4 for a cathode 5 and a support and

leading-in wire 6 for an anode 7. The anode 7 also serves as a capsule for getter material and consists of two thin metal pieces 8 each having a struck-out portion 9 to afford a containing space 10 for the getter material.

The pieces may be nickel or other suitable metal and secured together as for example by welding. The struck-out portions 9 are disposed at the margins of the plates 8 rather than in the central portions for reasons above disclosed.

A getter material is placed in the spaces 10 and may consist of caesium dichromate and a reducing agent such as calcium or misch metal. Upon heating the anode 7 by high frequency induction, the marginal portion of the pieces 8 are heated to higher temperatures than other parts of the anode 7, thus affording sufficient heat to effect the reduction of the caesium compound with the consequent liberation of caesium to the interior of the envelope. By disposing the struck-out portion 9 adjacent the front of the envelope 1 the caesium may be deposited at that point on the envelope.

Referring to Figs. 4 and 5 of the drawing another embodiment of my invention is shown in which the capsule 7' comprises two plates 8', only one of which has a pressed out portion 9' to afford a getter material containing space 10'. The plates are spot welded at points 11' to secure the same over the getter material. Pressed out portion 9' is disposed at the margin of the plate for the same reasons stated relative to the capsule 7'.

By my invention, it will be seen that I am enabled to provide a getter capsule comprising only two metal pieces, a pressed out portion adjacent the margin of at least one of these affording a containing space for the getter material. By this arrangement, I am enabled to heat the getter material by the hottest portion of the disc and to select the point within the tube at which the getter is to be deposited.

Although I have disclosed my invention as applied to a photo-electric cell it is to be understood that the capsule constructed in accordance with my invention may be applied to radio vacuum tubes and related devices wherever it is desirable to liberate a getter or a material to lower the cathode drop of the tube.

What is claimed is:

1. A getter capsule comprising metal pieces at least one of said pieces having a struck-out portion to provide a containing space for a getter material said containing space being disposed eccentrically with respect to the center of said pieces.

2. A getter capsule comprising two metal pieces at least one of said pieces having an eccentrically disposed struck-out portion to afford a containing space for a getter material.

3. A getter capsule comprising two metal pieces at least one of said pieces having a struck-out portion for a getter material the struck-out portion being eccentrically disposed relative to the pieces so that said portion will be at the hottest portion of the pieces when the capsule is heated by induction currents.

In testimony whereof, I have hereunto subscribed my name this 29th day of November, 1929.

ROGER HULL SINDEN.

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