

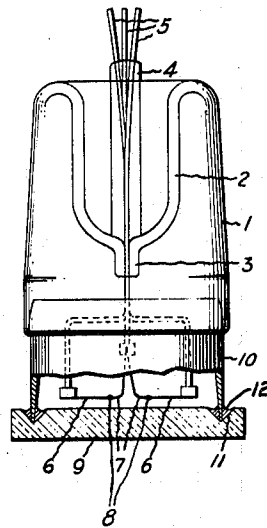
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EVACUATED RECEPTACLE

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EVACUATED RECEPTACLE

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4 Claims. (Cl. 136—4)

My invention relates to devices which are responsive to the reception of small amounts of radiation. More particularly it relates to the construction of an evacuated receptacle for enclosing such a device. It is the object of my invention to provide an improved receptacle for this purpose which will freely transmit radiation to the device, which will hold a high vacuum notwithstanding normal changes in temperatures, and which is of simple construction and inexpensive to manufacture.

My invention will be better understood from the following description taken in connection with the accompanying drawing, and its scope will be pointed out in the appended claims.

In the single figure of the drawing which illustrates the preferred embodiment of my invention, 1 represents the enclosing member, constructed for example of glass, having at one end thereof the stem 2 terminating in the press 3, as is common in lamp and electron tube structures. The stem and press support the tubulation 4 by which the completed receptacle is evacuated and also support the wires 5 by which the radiation responsive device within the receptacle may be connected to the outside circuit. The wires 5 at the inside of the press are shown supporting and connected with the terminals of the radiation responsive device which in the present case is shown comprising two similar thermo-junctions each of which comprises two thin strips 6 and 7 of dissimilar metals, such, for example, as copric and chromel. Strips 6 and 7 are firmly secured together, such as by welding, at the points 8.

Since the thermo-junctions are responsive to heat radiation or infra red rays, the open end of the enclosing member 1 is closed by a window which will readily transmit such radiation. Such a window is represented by the plate 9 which is composed of a fusible inorganic salt such as a halogen salt of sodium or potassium or calcium fluoride. By reason of its cheapness and availability I prefer to construct the plate 9 of rock salt.

Because of the brittleness of such material and the difficulty of making a reliable vacuum tight seal between a glass enclosing member and a window constructed of such material, I provide the enclosing member 1 with a terminal member or sleeve 10 constructed of a metal or alloy which will unite with but will not be corroded appreciably by the sealing material to be described below. For this sleeve I prefer to use silver. The sleeve has a tapered inner end forming a feather edge over which the glass is fused, thereby form-

ing a vacuum tight joint since the thin feather edge of the sleeve yields readily to differences in expansion of the glass and the sleeve. The sleeve 10 is similarly tapered at its outer end forming a feather edge by which a seal is made with the plate 9. In making this seal the plate 9 preferably is first provided with the groove 11 having a diameter suitable to receive the feather edge of the sleeve and the plate is then placed in a furnace with a small quantity of sealing material, preferably in the form of a wire, laid in the groove. The sealing material comprises a fusible inorganic salt which has a vapor pressure not greater than 1 micron of mercury at room temperature, which will adhere firmly to the sleeve and to the window and which does not appreciably corrode the metal of the sleeve. I have found that silver chloride is well adapted for this purpose. The plate and sealing material are then heated to a temperature of about 475 degrees C. at which temperature the sealing material, if silver chloride is used, will have melted and filled the groove in the plate.

The assembly comprising the enclosing member 1, Sleeve 10, and enclosed thermo-couples is then placed in an inverted position on the plate 9 with the feather edge of the sleeve resting in the groove containing the fused sealing material. The latter readily unites with both the plate 9 and the sleeve 10. The complete device is then removed to an oven of a somewhat lower temperature where it is allowed to cool slowly.

I have found that silver chloride is admirably well adapted for making a seal shown at 12 between the plate 9 and sleeve 10 particularly where a vacuum of the order of one-tenth to one micron is employed as in a device of this character since silver chloride has the necessary low vapor pressure and makes a firm joint between the plate 9 and the sleeve. Silver chloride furthermore being of a waxy, amorphous nature is of a yielding character which further facilitates relieving the joint of strains due to differences in expansion.

Under certain circumstances it may be found desirable to construct the member 1 of metal, for example, silver, in which case the present joint between the glass member and the sleeve would be avoided.

I have chosen the particular embodiment described above as illustrative of my invention and it will be apparent that various modifications may be made without departing from the spirit and scope of my invention which modifications I aim to cover by the appended claims.

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

1. An evacuated receptacle containing a device responsive to radiation comprising an enclosing member, a radiation transmitting end plate and a silver chloride seal therefor, said enclosing member having a flexible metallic edge portion against which one face of said plate is pressed and which is not corroded by silver chloride.
2. An evacuated receptacle containing a device responsive to radiation comprising an enclosing member having a silver terminal portion, an end plate composed of a radiation transmitting fusible salt and a silver chloride seal between said terminal portion and said end plate.
3. An evacuated receptacle containing a device

responsive to heat radiation comprising an enclosing member having a thin silver terminal edge, a rock salt end plate arranged to have one face thereof pressed against said edge and a seal between said edge and plate composed of silver chloride.

4. An evacuated receptacle containing a device responsive to heat radiation comprising an enclosing member having a terminal silver sleeve member provided with a thin, tapering edge, a rock salt end plate therefor arranged to have one face thereof pressed against said edge and having a groove for receiving said edge and a silver chloride seal in said groove.

AUGUST J. KLING.