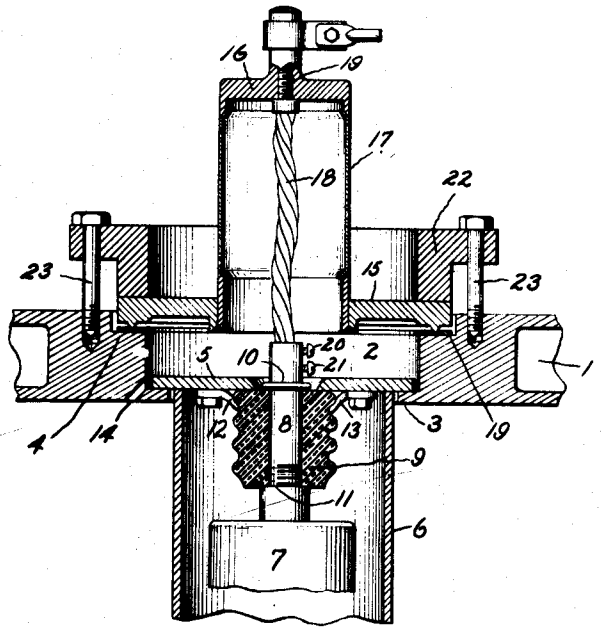
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SEAL FOR MERCURY ARC RECTIFIERS

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SEAL FOR MERCURY ARC RECTIFIERS

Application filed February 28, 1925. Serial No. 12,440.

My invention relates to vapor electric devices, and more particularly to high power mercury rectifiers having metal walled envelopes.

In devices of the type described considerable difficulty is experienced in providing a proper seal for the rectifier since it is not only necessary that the seal should be gas-tight, but that it should also be able to withstand high temperatures, and contraction and expansion changes.

It is the object of my invention to provide a seal which will overcome the above difficulty.

In accordance with my invention I have provided an anode seal comprising a hood having upper and lower flanged metallic portions, and an intermediate glass or vitreous portion. The anode is supported in an opening in the rectifier tank. To allow for expansion and contraction of the lead-in member connected to the anode I have connected the upper flanged member of the hood to the lead-in member by means of a yielding or flexible conductor. With this arrangement I am enabled to use a seal which will be vacuum-tight, give excellent insulation, and at the same time be unaffected by temperature changes.

The novel features which I believe to be characteristic of my invention are set forth with particularity in the appended claims. My invention itself, however, both as to its organization and method of operation will best be understood by reference to the following description taken in connection with the following drawing in which the figure shows a cross section of a portion of a vapor rectifier.

I have indicated on the drawing a portion of one of the walls of a metal rectifier 1, the greater portion of the rectifier, including the cathode, having been omitted in the interest of clearness. The rectifier is provided with an opening 2, having flanges 3 and 4 at the lower and upper ends thereof. A closure member 5, which may be of metal, is associated with the opening and has integral therewith a shield 6 which is substantially concentric with an anode member 7. The anode is provided with screw threads whereby it may be detachably connected to a lead-in conductor 8 which extends through an opening in the closure member 5. A porcelain insulator 9 is mounted on the lead-in conductor between shoulders 10 and 11, and cooperates with flanged members 12 and 13 to support the anode on the closure member.

None of the connections thus far described are made vacuum tight, in fact the space above the closure member 5 is vented by means of an opening 14 so that any mercury which might get into this space will escape into the body of the rectifier, and will not be forced into the anode chamber.

The vacuum seal is obtained by means of a hood which comprises lower and upper flanged metallic portions 15 and 16, and an intermediate glass sleeve portion 17. The metal portions of the seal may be composed of chrome iron or any other alloy having an expansion coefficient similar to that of the glass used and a surface oxide which combines readily with the glass. The upper flanged portion or cap 16 is provided on its inner side with screw threads, and on its outer side with a solid projecting portion, whereby conductors may be detachably connected both to the inner and outer sides.

In order that the seal shall not have to support the weight of the anode parts and in order that the expansion or contraction of the lead-in conductor 8 may not affect the glass portion of the seal I provide a flexible or yielding conductor 18 which may be detachably connected to the upper member 16 by means of the screw threads 19, and to the anode 7 by means of screws 20 and 21. The lower flanged member 15 engages the flange 4 surrounding opening 2. Any suitable form of gasket may be employed to make a tight joint at the junction of member 15 with flange 4. In the present instance I have employed an aluminum ring 19.

In assembling the device the flexible connector 18 is attached to the upper member 16 by means of a screw threaded portion, and to the lead-in conductor 8 by means of the screws 20 and 21 after which the closure member, anode and seal may be lowered into place

and clamped in position by means of the clamping ring 22, which is retained by cap screws 23.

Although I have shown but one modification of my invention it will be apparent that many modifications thereof may be employed without departing from the scope of my invention as set forth in the appended claims.

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

1. In a combination, a vapor electric device provided with an opening, an electrode, means for supporting said electrode, sealing means for said opening, said sealing means including a vitreous sleeve interposed between a pair of metal members, and a flexible cable extending between one of said metal members and said electrode.

2. In a vapor electric device, a casing provided with an opening, a flange surrounding said opening, a closure member associated with said flange, and an anode supported by said member, said casing being further provided with a vent connecting said opening and the interior of said casing.

3. A vapor electric device including a casing having an opening, a hood provided with upper and lower metallic members interconnected by an insulation member and arranged to seal said opening, a metallic closure member for said opening, an electrode, a refractory insulating member interposed between said anode and closure, a shield integral with said closure member and surrounding said electrode, and a flexible conductor connected between said electrode and one of said metallic members.

In witness whereof, I have hereunto set my hand this 27th day of February, 1925.

DAVID C. PRINCE.