

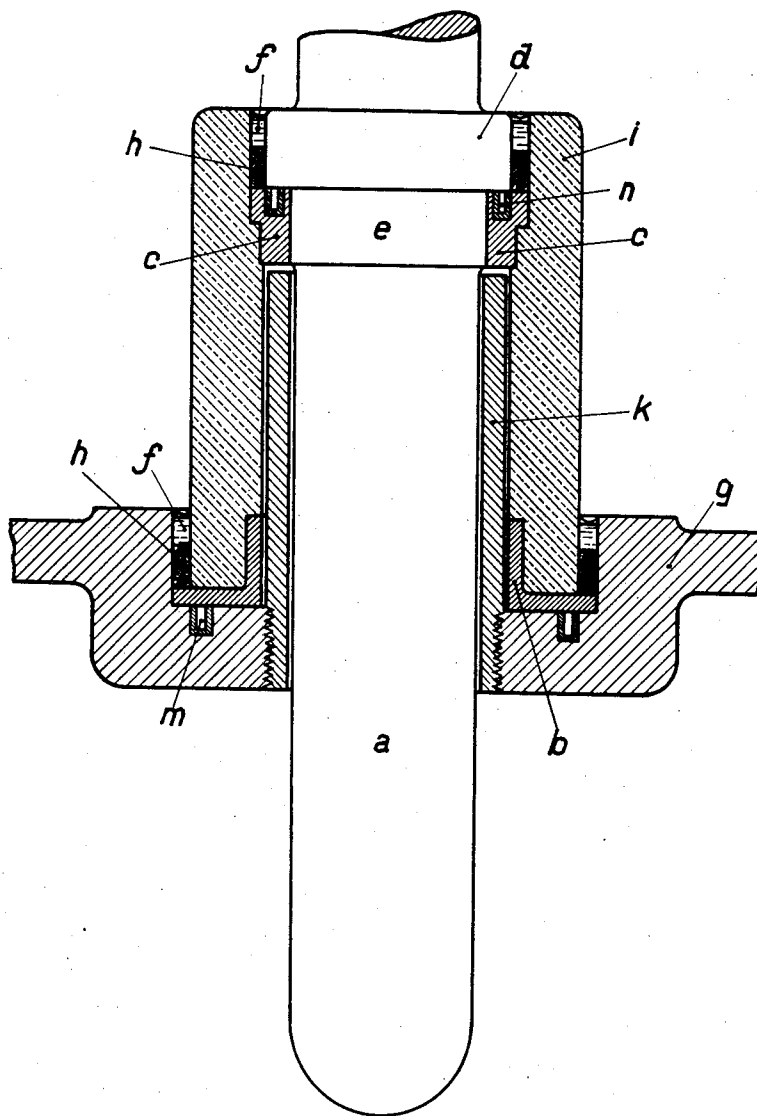
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VACUUM TIGHT SEAL

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UNITED STATES PATENT OFFICE.

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VACUUM-TIGHT SEAL.

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The most satisfactory packing for joints for sleeve-insulators for leading electrodes through the walls of metal vessels containing a vacuum (more particularly for leading-in the anodes in mercury vapour rectifiers) has been found to be a combination of a layer of asbestos with a mercury seal superposed on it: Various other packings have failed in practice for reasons which vary with the various materials used.

The present invention has for its object to provide an improved vacuum-tight joint which is at least equal in efficacy to the proved mercury and asbestos joint above referred to and attains various additional advantages. An essential feature of this improved joint for sleeve-insulators for electrodes is that suitably shaped metallic members are cemented to the sleeve insulator at the places where the packing material is introduced.

A constructional example of this invention is illustrated in the accompanying drawing which is an axial section of the improved joint applied to the case of an insulating and vacuum tight sleeve-insulator for an anode of a mercury vapour rectifier. According to this construction, as shown, the insulator *i* has cemented to it at the two jointing places, joint members in the form of metal rings *b* and *c* which serve as centering guides and supporting means for the insulator and the anode *a*. The arrangement is as follows:—The anode is fitted by means of a bearing fillet *e* and a fixed collar *d* into the ring *c*, whilst the ring *b* fits with its base and its outer edge exactly in an annular groove formed in the rectifier vessel or cover *g*. At both jointing places there is provided above the rings *b* and *c* respectively a narrow cylindrical annular space for the reception of the packing. This packing is composed of a pliable packing *h* of asbestos, lead wool, lead cord, or the like and a liquid seal *f*. This sealing liquid may be mercury, provided the packing *h* is a non-metal (for instance asbestos), and the rings *b* and *c* are made of a metal (for instance iron) that will not amalgamate. To avoid such limitations, the sealing liquid *f* may consist of viscous substances having low vapour pressure and such viscosity that even when heated to the ordinary working temperatures they will not exude through the pores or interstices of the packing, such as for instance a soft compound such as picein, oil varnish, &c.

The construction of the packings *h* and *f* is such as to ensure a vacuum-tight closure of the actual joint proper between the ring *c* and the anode *a* as well as between the ring *b* and the wall *g* of the vessel, and also the cemented joint between the ring *b* or the ring *c* and the insulator *i*.

For the purpose of catching any sealing liquid that may leak through or run off in the dismantling of the apparatus, gutters *m* and *n* are provided underneath the packed joints, which gutters can be removed and emptied and also cleaned out when the electrode is dismantled.

With the object of cooling and protecting the anode *a* from silent discharges, the said anode is enclosed, so as to leave a narrow space between the two, in a metal jacket *k* which may be screwed in the wall of the vessel.

What I claim is:—

1. An insulating joint for electrical apparatus comprising the combination with a vessel provided with a seat portion, of an insulator for accommodating an element to be insulated from the vessel, and metallic joint members affixed to the insulator and formed for contact respectively with the seat portion and said element, said joint members forming the sole connections between the insulator and said other parts.

2. Electrical apparatus comprising the combination with a vessel affording a seat portion and an element to be insulated therefrom, of an insulator for accommodating passage of said element into the vessel, and metallic joint members affixed to the insulator, one of said joint members being formed to fit the seat portion and the other to fit the element.

3. An insulating joint for electrical apparatus comprising the combination with a sealed vessel affording a seat portion and an element to be insulated therefrom, of an insulator formed to accommodate passage of said element into the vessel, a metallic joint member affixed to the insulator and formed for fitting contact with said element, whereby the latter is supported on the insulator, and another metallic joint member affixed to the insulator and formed for fitting contact with the seat portion, whereby the insulator is supported on the latter.

4. An insulating joint for electrical apparatus comprising the combination with a sealed vessel having a seat portion and an ele-

ment to be insulated therefrom, of an insulator formed to accommodate passage of the element into the vessel, a metallic joint member affixed to the insulator and formed to make a centering fit on the element, and another metallic joint member affixed to the insulator and formed to make a centering fit on the seat portion.

5. An insulating joint for electrical apparatus comprising the combination with a sealed vessel having a seat portion and an element to be insulated therefrom, of an insulating bushing having a longitudinal bore for accommodating said element, a metallic joint member affixed to the bushing and extending into its bore, said joint member being formed to make a supporting and encompassing fit on the element, and a second joint member affixed to the bushing and formed to make a centering fit on the seat portion.

6. An insulating seal for electrical apparatus comprising the combination with a sealed vessel and an element to be insulated therefrom, of an insulator formed to accommodate passage of the element into the vessel, a metallic joint member affixed to the insulator and having a close fit against the element, a second joint member affixed to the insulator and having a close fit against a portion of the vessel, and sealing material cover-

ing the joints between said joint members and the other aforementioned parts.

7. An insulating seal for electrical apparatus comprising the combination with a sealed vessel and an element to be insulated therefrom, of an insulator formed to accommodate passage of the element into the vessel, a metallic joint member carried on the insulator and having close fit with peripheral and overhanging surface portions of the element, a second metallic joint member connected to the insulator and having close fit with angularly related surface portions of the vessel, and liquid material covering the joints between the contacting portions of the joint members and said other parts.

8. Electrical apparatus as specified in claim 2, together with sealing liquid covering the joints between said joint members and the parts in contact therewith, and gutters arranged to receive sealing liquid seeping through said joints.

9. Electrical apparatus as specified in claim 2, together with sealing liquid covering the joints between said joint members and the parts in contact therewith, and gutters communicating with said joints.

In testimony whereof I have signed my name to this specification.

WALTER DALLENBACH.