

Fig. 1

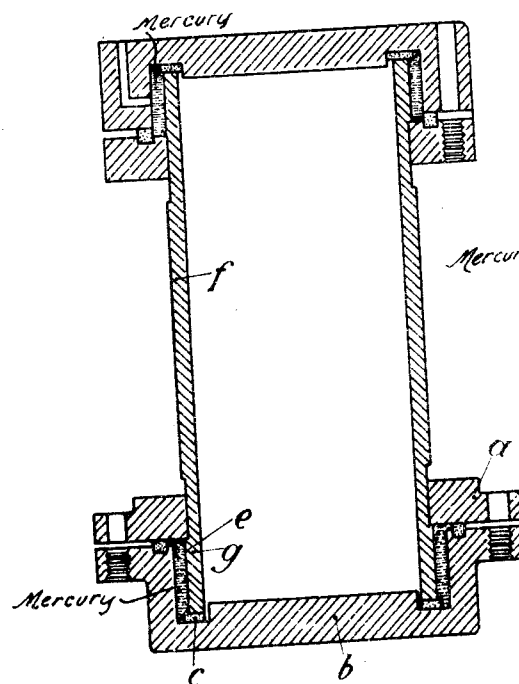
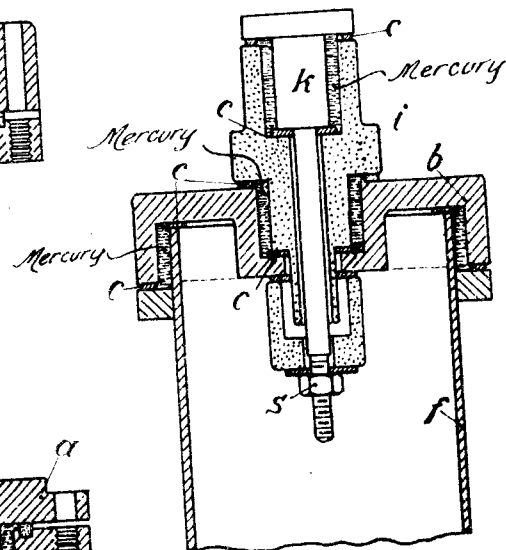


Fig. 2



WITNESSES

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HERMETICALLY SEALING METAL VAPOR APPARATUS WITH MERCURY PACKING.

1,048,592.

Specification of Letters Patent.

Patented Dec. 31, 1912.

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To all whom it may concern:

Be it known that I, BÉLA BENJAMIN SCHAEFER, a citizen of the German Empire, and residing at Frankfort-on-the-Main, in the Province of Hesse-Nassau, Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Hermetically Sealing Metal Vapor Apparatus with Mercury Packing, of which the following is a specification.

Metal-vapor apparatus require, as is well-known, a permanently high vacuum which renders the employment of absolutely hermetically closed vessels necessary. With the glass vessels still employed for low outputs, this condition is fully complied with; but for greater outputs, for example with mercury vapor-arc rectifiers for several hundred amperes, only metal vessels are suitable, the satisfactory hermetic closing of which entails considerable difficulty. Simple steel tubes, closed at both ends by means of disks have proved suitable for forming the vessels; while mercury packings of known form constitute a satisfactory hermetic sealing.

Metal vapor apparatus comprising vessels with mercury packings have already been described; but experience has shown that the known constructions are much more costly to manufacture, and, as regards the hermetic sealing, more liable to sources of error, than similar apparatus constructed according to the present invention.

Figure 1 is a vertical section of a vapor vessel embodying the present invention. Fig. 2 is a detail sectional view showing the invention used in connection with a vessel having an electrode.

One of the simple and practical embodiments of the invention is shown in Fig. 1 of the drawings. In this illustration of the invention, the flange *a* is shrunk upon the metal tube *f*. The lower flanged sealing head *b* is made cup-like and is pressed against the end *g* of the tube *f*. The packing ring *c* may be of asbestos, rubber or the like, and the chamber *e* is charged with mercury. The cup-like bottom at the same time serves

as a receptacle for the liquid cathode. The advantages of this arrangement are as follows:—No special air-tight connection of the flange *a* with the tube *f* is necessary. The pressure of the mercury against the walls of the chamber *e* increases toward the mouth of the tube; consequently, any penetration of air is rendered much more difficult. Finally, the quantity of mercury required for packing is reduced to a minimum, owing to the relatively small circumference of the chamber *e*. The upper end of the tube *f* is closed in a like manner.

The results obtained in practice show that, with the last described arrangement, a very reliable hermetic connection can be formed between the various parts of the vessels of metal-vapor apparatus.

The method proposed, when applied in packing large vacuum vessels, leads furthermore, as may be seen from Fig. 2, to a very convenient and reliable construction for introducing the electrodes. The insulator *i*, like the mouth of the tube *f*, is inserted in the end plate *b* and packed with mercury. In like manner, the head *k* of the electrode holder is inserted in the insulator *i* and similarly packed. The screw *s* enables the necessary pressure to be obtained for packing the asbestos ring *c*.

Now, what I claim is:

1. A hermetical seal for metal-vapor apparatus comprising, in combination, the vessel, a flange rigidly carried by the vessel at a distance from an open end thereof, a sealing head arranged over said open end, packing interposed between said head and the end of the vessel, packing interposed between said head and the flange, and a mercury filling confined about the external end portion of the vessel between the said packings.

2. A hermetical seal for metal-vapor apparatus comprising, in combination, the vessel, a flange rigidly carried by the vessel at a distance from an open end thereof, a flanged sealing head arranged over said open end and provided with a central depression, packing between the rigid flange and the

flanged head, packing between the end of
the vessel and the said head, a mercury fill-
ing confined about the external end portion
of the vessel and within the flange of the
5 head, an electrode insulator extending into
the central depression of the head, packing
between the insulator and the outer side and
bottom of the depression of the head, and

a mercury filling about the insulator within
said depression. 10

In testimony whereof I have affixed my
signature in presence of two witnesses.

BÉLA BENJAMIN SCHAEFER.

Witnesses:

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