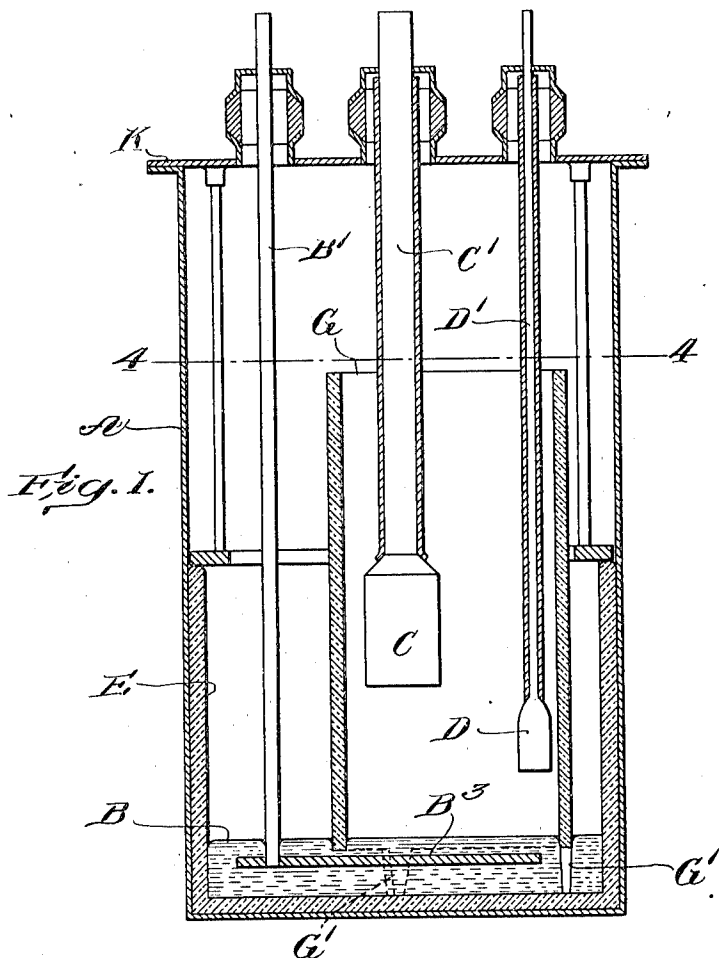
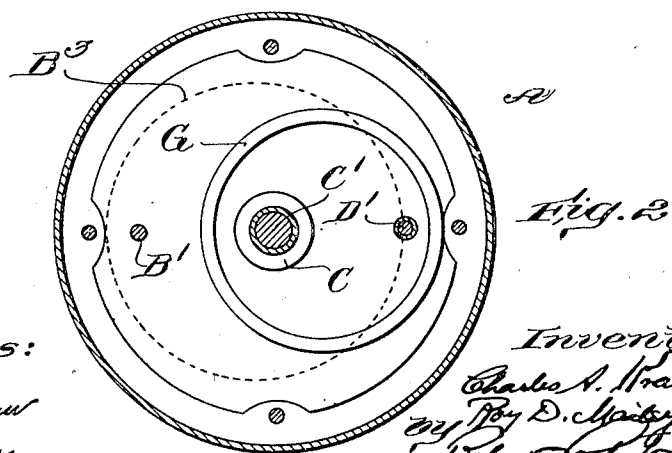


C. A. KRAUS & R. D. MAILEY.
ELECTRODE LEAD FOR VAPOR ELECTRIC APPARATUS.
APPLICATION FILED JUNE 30, 1910.

1,066,504.

Patented July 8, 1913.



Witnesses:

Josephine H. Ryan
Charles J. Woodbury

Inventors

Charles A. Kraus
Roy D. Mailey
By Robert W. Cushman
Attys.

UNITED STATES PATENT OFFICE.

CHARLES A. KRAUS, OF NEWTON HIGHLANDS, AND ROY D. MAILEY, OF LYNN,
MASSACHUSETTS.

ELECTRODE-LEAD FOR VAPOR ELECTRIC APPARATUS.

1,066,504.

Specification of Letters Patent.

Patented July 8, 1913.

Application filed June 30, 1910. Serial No. 569,700.

To all whom it may concern:

Be it known that we, CHARLES A. KRAUS and ROY D. MAILEY, both citizens of the United States, and residents, respectively, of Newton Highlands and Lynn, in the counties of Middlesex and Essex and State of Massachusetts, have invented new and useful Improvements in Electrode-Leads for Vapor Electric Apparatus, of which the following is a specification.

Our invention relates to the construction of vapor electric apparatus and has for its special object the provision of mercury cathode leads and connections which shall be efficient and durable under operative conditions which involve the transformation of currents of large capacity through the apparatus.

A well known type of vapor electric apparatus is found in the so-called mercury arc rectifier and our invention is therefore herein described in its application to such a rectifier.

In the design and construction of a mercury arc rectifier capable of rectifying alternating currents considerably exceeding 50 amperes, the requisite dimensions and proportions of the apparatus and the anode, and strains incident to handling and operation, render it necessary to construct the container wholly or largely of metal, such as sheet metal, and so far as our experience with such apparatus serves as a guide, it is practically necessary to introduce the electrode leads pertaining to such a metal contained apparatus through the upper portion, preferably the cover of the container, hermetically sealing the leads in hoods or extensions which comprise effective insulation. The general form and arrangement of such apparatus will be found shown and described in an application for United States Letters Patent heretofore filed by us on or about August 27th, 1909, Serial No. 514,908.

It is essential to the proper continuous operation of such a rectifier that the path of the arc be as directly as possible from the anode to the mercury cathode. The point of departure of the arc from the mercury cathode which is called the "cathode spot" moves about more or less upon the surface of the mercury. It is moreover a well known fact that if a solid metal is

placed in contact with the mercury cathode, there is a tendency for the cathode spot to form on the solid metal surface and remain there, and we have found that the cathode spot may, unless provisions are made to the contrary, leave the mercury surface entirely and run along a metallic cathode lead until it arrives at a point as near as possible to the anode. Such action is detrimental because it interferes with the normal, proper behavior of the rectifier and also endangers the integrity of the cathode lead. It is to this situation that the improvements herein described are addressed.

In the drawings hereto annexed which illustrate examples of our invention,—Figure 1 is a vertical section of a metal contained rectifier; and Fig. 2 is a cross section of the same along the line 4—4 in Fig. 1.

Referring to the figures, A represents a cylindrical metal container constructed preferably of sheet steel to which a lid K of the same material is hermetically joined as by welding. A cathode lead B' and anode leads C', D' communicate with the cathodes B and anodes C, D, respectively and are sealed through the cover K in the manner described in our application Serial No. 514,908. The mercury cathode B is contained in a cup or lining E made of refractory insulating material, and the cathode lead comprises a plate preferably of iron or steel and marked B³ which is secured to and supported by the riser portion B'. That portion of the cathode lead which extends upward from the mercury is of unprotected metal, the tendency as above described is for the cathode spot to creep up on the metal riser B' until it is close to the anode C.

In order to confine the cathode spot from which the arc proceeds, and to prevent wandering and creeping of this cathode spot, we provide a screen or cylinder G of insulating material, such as porcelain, the lower edge of which dips below the surface of the mercury cathode B, and which surrounds the anode or anodes of the apparatus extending upward to a point well above the active anode surface. This shield G thus acts as a barrier to the passage of an arc from an anode to any portion of the cathode except immediately below the anode or to any solid metal portion of the cathode lead.

This protective screen or cylinder may conveniently be mounted on legs G' which rest on the bottom of the cathode cup E.

What we claim and desire to secure by
5 Letters Patent is:

1. In a vapor electric apparatus, a closed
10 container, a mercury cathode in the bottom thereof, an anode, leads for the cathode and anode respectively, comprising risers extending upward and sealed in the container wall, and a screen of insulating material surrounding the anode and in contact with the mercury of which the cathode is composed.

2. In a vapor electric apparatus, a closed
15 container, a mercury cathode in the bottom thereof, an anode, and an inclosure of insulating material surrounding and confining the arc path between the anode and the mercury surface within said inclosure.

Signed by us at Boston, Massachusetts
20 this twentieth day of June 1910.

CHARLES A. KRAUS.
ROY D. MAILEY.

Witnesses:

CHARLES D. WOODBERRY,
JOSEPHINE H. RYAN.