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 ANODE SHIELD FOR VAPOR ELECTRIC APPARATUS.
 APPLICATION FILED APR. 5, 1912.

1,066,505.

Patented July 8, 1913.

Fig. 1.

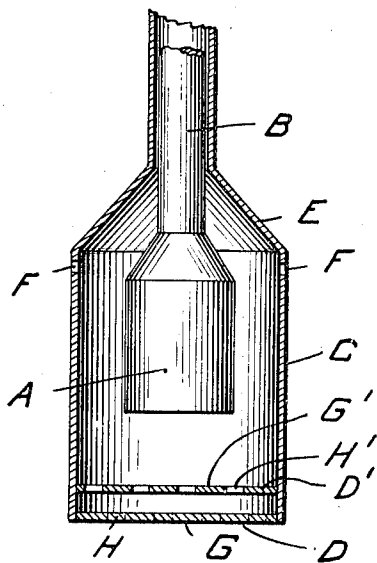


Fig. 3.

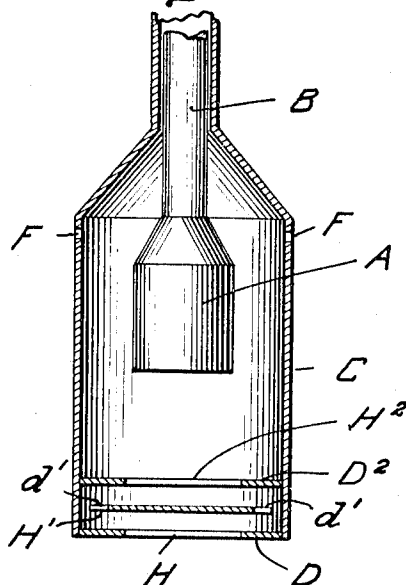


Fig. 2.

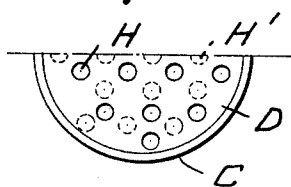
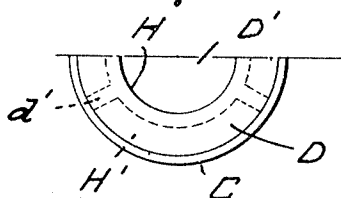


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE,

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ANODE-SHIELD FOR VAPOR ELECTRIC APPARATUS.

1,066,505.

Specification of Letters Patent.

Patented July 8, 1913.

Application filed April 5, 1912. Serial No. 688,613.

To all whom it may concern:

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

Our invention consists in an improved shield for anodes of vapor electric apparatus, and has for its object the prevention of short-circuit arcing, which too frequently has impaired the operation and damaged the structure of vapor electric apparatus.

The construction of anode shield which characterizes this invention is the result of trial and elimination of sundry other contrivances which were designed to meet the conditions supposed to be responsible for short-circuit arcing but which failed to operate in the manner expected, and gave rise to the suspicion that the hypotheses concerning short-circuit arcing and its causes were at fault. For instance, it has been suggested that the phenomenon of arcing is due to the presence of mercury on the anode surface, and on this theory it seemed reasonable to suppose that several screens of wire gauze interposed between the anode and mercury cathode would prevent conveyance of mercury to the anode and thus preclude short-circuit arcing. But we have found that this method is not effective, even though the arc is made to pass through several fine mesh screens in succession. Possibly the explanation of short-circuit arcing by reason of the presence of mercury at the anode is correct, or at least correctly accounts for one cause among several, and it may be that wire mesh screens allow small bodies of mercury to pass from the cathode to the anode, although one would suppose that several such screens would prevent it.

While we do not deny the plausibility of such explanations of short-circuit arcing, neither do we assert or advance any theory of our own; we believe the matter still rests in doubt.

Ignoring hypothetical explanations, we have contrived and used an anode shield which, under conditions which have proved the futility of other forms of shield, adequately prevents short-circuit arcing even in

apparatus of high energy-capacity. Why this form of shield is effective we do not pretend to explain; that it is effective our tests have demonstrated.

In the drawings hereto annexed which show examples of our invention,—Figure 1 is a vertical section of an anode and shield; Fig. 2 is a bottom plan half view; Fig. 3 is a vertical section of a modified arrangement; and Fig. 4 is a bottom plan half view of Fig. 3.

The anode is lettered A, its lead B. A box or inclosure C, with top E, preferably made of insulating material, such as porcelain or fused silica, is secured to and suspended from the lead B. This box forms an inclosure for the anode A. Should conducting material be used for the box C, it should be insulated from the anode.

At the bottom of the box C two partitions, D and D', are provided. These may be of metal. Apertures H are made in partition D, apertures H' in partition D'. These apertures are non-registering, that is to say, the apertures H in partition D stand opposite the solid or unperforated portions G' of the partition D', and vice versa, the apertures H' are blanked by solid portions G. As many such partitions as are desired may be interposed below the anode A.

Another form is shown in Figs. 3 and 4, where the partition D has a single large circular aperture H, and the partition D' is joined to and supported by the walls of the box C, by means of spider arms d' so that the aperture H' is annular around the central plate or partition D'. A third partition D² has a central aperture H².

For the sake of maintaining a slow circulation of mercury vapor through the box C, small apertures F are provided. Circulation of mercury vapor is considered desirable as a vehicle to carry away gases emitted from metal parts.

As above stated, why the arrangement of a plurality of or multiple partitions with staggered or non-registering apertures is effective to prevent short-circuit arcing where wire mesh screens are futile, we do not pretend to explain, but merely state the fact, and regard the improvement as a discovery arrived at by purely empirical methods.

We claim:

1. The combination with the anode of a vapor electric apparatus, of a box inclosing

the anode, a plurality of partitions at that end of the box which lies toward the cathode, said partitions perforated with non-registering openings.

- b 2. The combination with the anode of a vapor electric apparatus, of a box inclosing the anode, a plurality of partitions at that end of the box which lies toward the cathode, said partitions perforated with non-

registering openings and said box provided 10 with upper apertures for vapor circulation.

Signed by us at Boston, Massachusetts,
this 18th day of March 1912.

CHARLES A. KRAUS.
ROY D. MAILEY.

Witnesses:

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