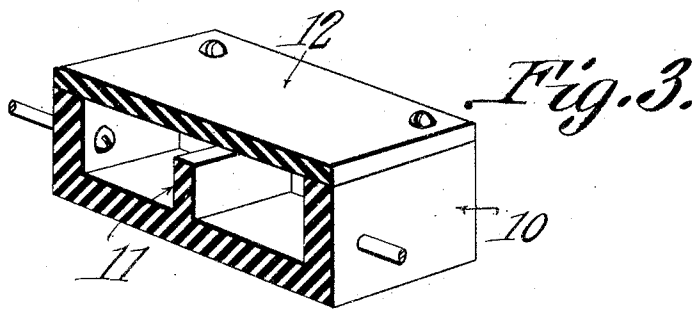
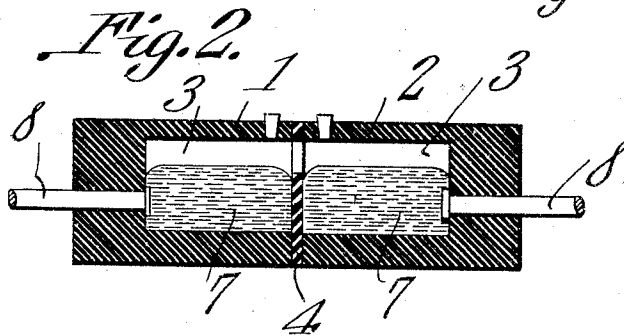
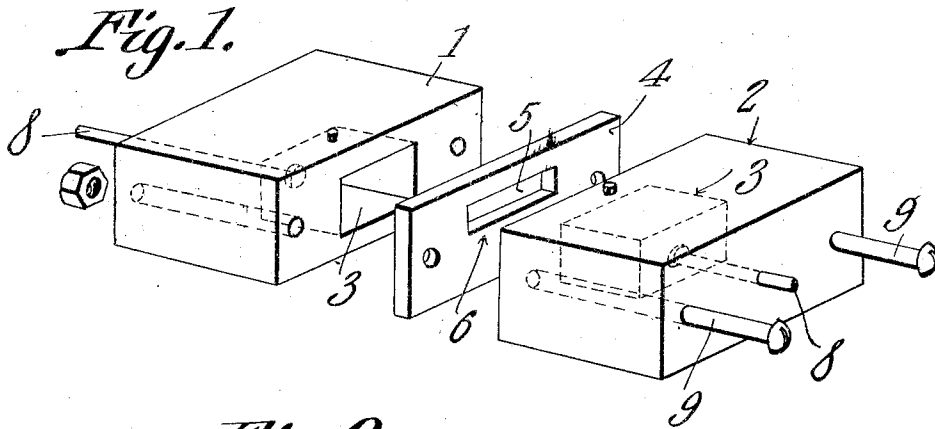


F. M. BUTLER.
LIGHTNING ARRESTER.
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969,336.

Patented Sept. 6, 1910.



Witnesses

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UNITED STATES PATENT OFFICE.

FABIUS M. BUTLER, OF DAVID CITY, NEBRASKA.

LIGHTNING-ARRESTER.

969,336.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FABIUS M. BUTLER, a citizen of the United States, residing at David City, in the county of Butler and State of Nebraska, have invented a new and useful Lightning-Arrester, of which the following is a specification.

This invention has reference to improvements in lightning arresters and its object is to provide a self adjusting lightning arrester which will not burn or get dirty and wherein the contact terminals will not corrode.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings, forming a part of this specification, in which drawings,

Figure 1 is a perspective view of the lightning arrester with the parts separated. Fig. 2 is a longitudinal section with the parts assembled. Fig. 3 is a perspective view of a slightly different form than that shown in Figs. 1 and 2.

In the structure shown in Figs. 1 and 2 there are provided two blocks 1 and 2 each having formed in one end a chamber 3. There is also provided a division plate 4 through which there is formed a slot 5 nearer to one edge of the plate than the other and matching the openings of the chambers 3 of the blocks 1 and 2. The slot 5 is so positioned in the plate 4 that when the parts are assembled the slot will match a portion only of the openings into the chambers while the remainder of the openings into the chambers is covered by a portion 6 of the plate 4 immediately adjacent to the slot 5.

When the parts are assembled as shown in Fig. 2 the plate 4 is confined between contiguous faces of the blocks 1 and 2 and the portion 6 of the plate 4 forms a division wall between the two chambers and projects from the bottom of the chamber, the blocks 1 and 2 being assumed to be horizontally disposed, to near the tops of the chambers so that only the upper portions of the chambers have communication by slot 5.

The blocks 1 and 2 and the plate 4 may be made of suitable insulating material, preferably refractory insulating material or the blocks 1 and 2 may be made of carbon or of suitable metal and the plate 4 be made of insulating material, and the chambers 3 in the

two blocks are partly filled with masses 7 of mercury.

It is a peculiarity of mercury that where brought into contact with certain surfaces there is surface repulsion so that the mercury rounds up away from such surfaces and its central portion is sensibly more elevated than where contacting with the said surfaces. This characteristic of mercury is utilized in connection with the present invention and the mercury masses 7 are made sufficiently deep so that the adjacent portions where engaging the surfaces of the portion 6 of plate 4 rise above the lower edge of slot 5 so that the mercury masses are separated by a direct air gap but slightly greater than the thickness of the plate 4.

Conductors 8 are introduced through the blocks 1 and 2 into the ends of the chambers 3 remote from the plates 4 although of course the particular location of the conductors as shown and described is not mandatory and these conductors may enter the chambers 3 in other directions. Of course the ends of the conductors 8 where engaging the mercury are made of a material to which mercury is inert.

The blocks 1 and 2 with the intervening plate 4 may be firmly clamped together by means of bolts or screws 9 indicated in Fig. 1, and these bolts or screws when the blocks are of conducting material are suitably insulated therefrom.

If one of the conductors 8 be connected to the instrument or circuit to be protected and the other conductor 8 be grounded, where the structure is used as a lightning arrester, or if the structure be introduced in a circuit in any other of the usual modes of protecting electrical instruments or lines, then on the passage of a current of sufficiently high potential the resistance of the air gap between the rounded up edges of the mercury masses 7 on the opposite sides of the plate 4 at the slot 5 will be broken down and current will pass from one mass of mercury to the other in a manner common to lightning arresters and instruments of such character.

When the discharge ceases the mercury on account of its extreme mobility will immediately return to the former condition and the apparatus is ready for the passage of another such discharge. Because of the large surface presented and because of the

character of mercury there is no danger of burning of the terminals since there is a constant presentation of new surfaces and for the same reason there is no corrosion of the terminal surfaces. Since the mercury masses return to their normal condition immediately on the cessation of a discharge over the air gap through the slot or passage 5, the device is self setting and will maintain its efficiency for a long period of time without attention.

In Fig. 3 there is shown another form of the invention where the blocks 1 and 2 and the plate 4 are replaced by a single block 10 having its interior formed into two chambers by an intermediate diaphragm 11 of less height than the outer walls of the container 10 and a suitable cover 12 may be applied although this cover is not necessary for the operation of the device and if desired may be omitted. The division wall 11 may be molded in one piece with the rest of the block if the block be made of moldable material.

The lightning arrester may be coupled up in electric circuits in any suitable manner.

What is claimed is:—

1. A lightning arrester comprising a receptacle having chambers or cavities separated by a wall of less height than the depth

of the cavities said cavities each containing mercury, and circuit terminals entering the cavities into electrical contact with the mercury.

2. A lightning arrester comprising a receptacle having chambers or cavities separated by a wall of less height than the depth of the cavities, each cavity containing mercury to a maximum depth greater than the height of the division wall, and circuit terminals entering the cavities into electrical contact with the mercury.

3. A lightning arrester comprising blocks of suitable material each with a chamber or cavity secured therein, a division plate of insulating material provided with a passage there-through and located between the chambered blocks with the passage constituting a communication between the chambers or cavities at the upper portions thereof, and mercury in the cavities to a maximum depth greater than the height of the division plate where separating the cavities.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FABIUS M. BUTLER.

Witnesses:

J. B. POSPESEL,

J. K. MASHEK.