(No Model.)

J. P. CULGAN.

LIGHTNING ARRESTER.

No. 571,109. Patented Nov. 10, 1896.

Fig. 1.

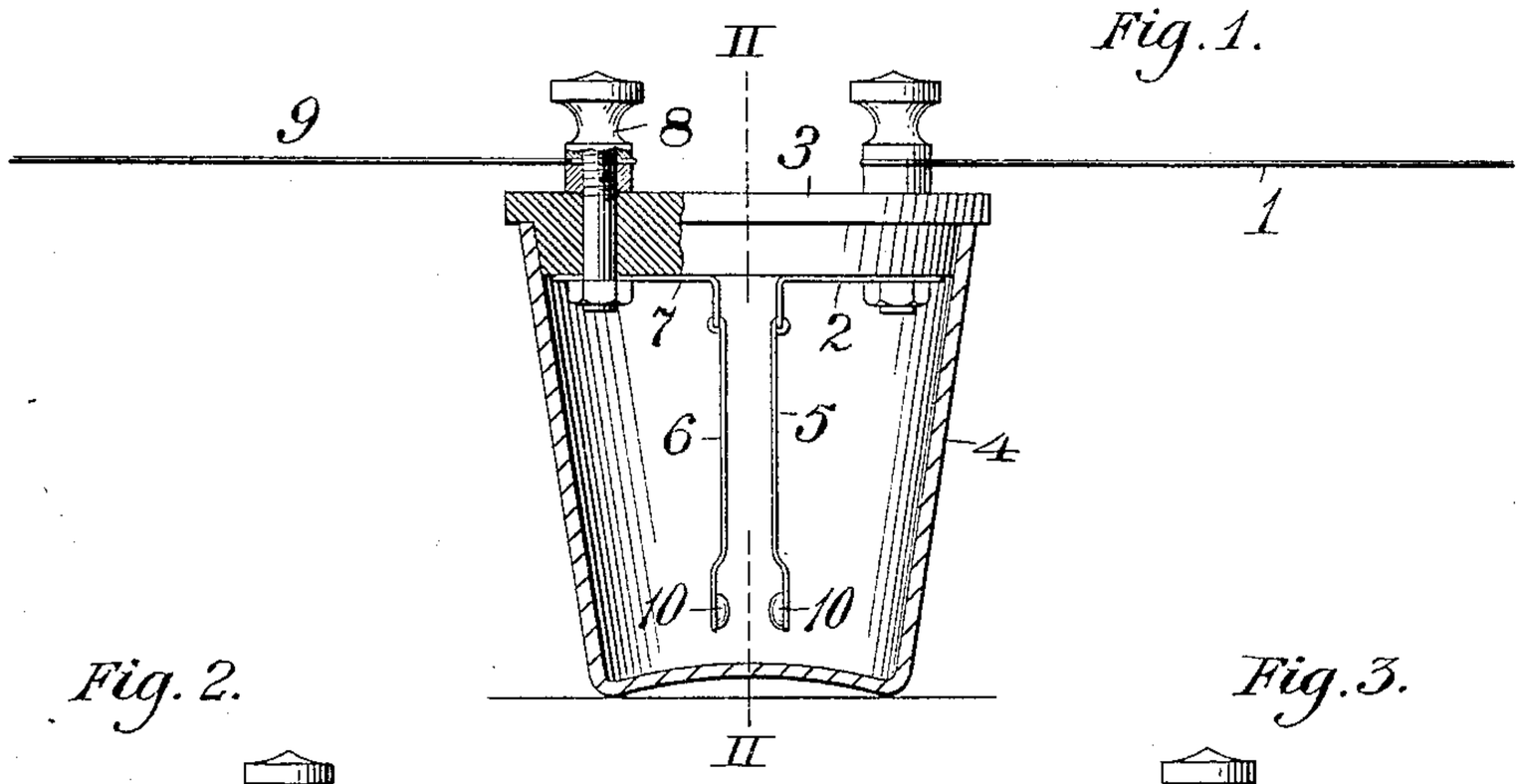


Fig. 2.

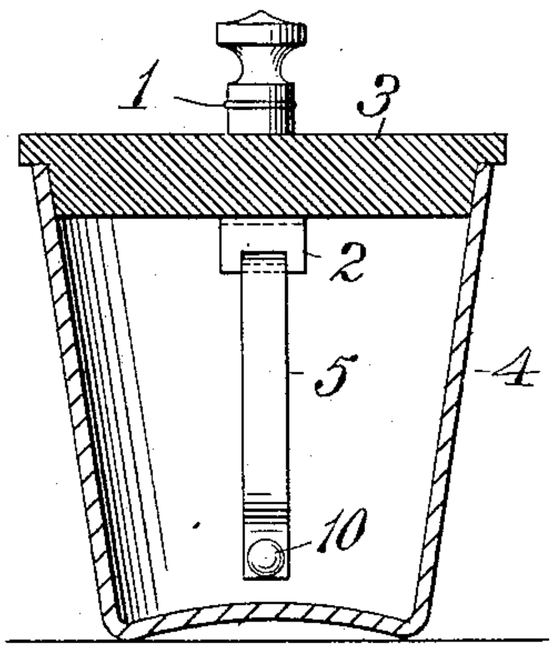


Fig. 3.

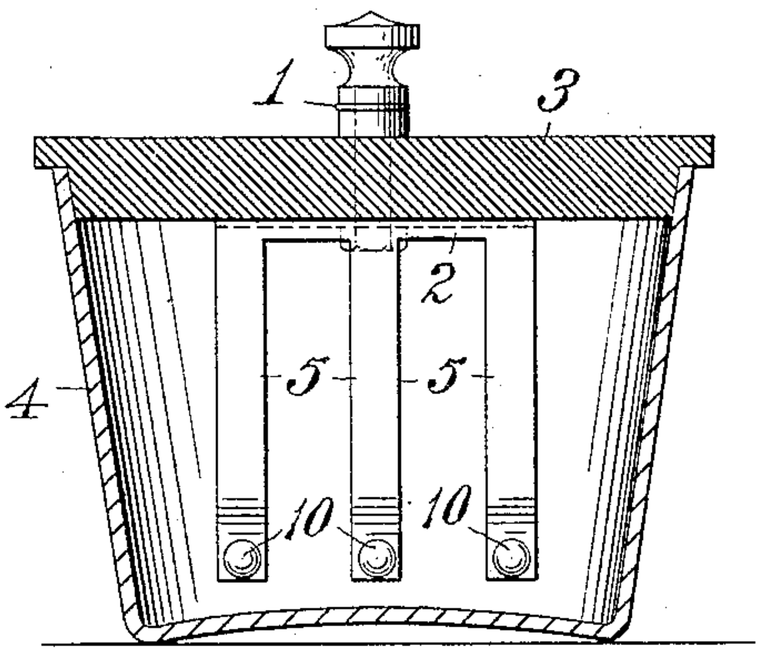


Fig. 4.

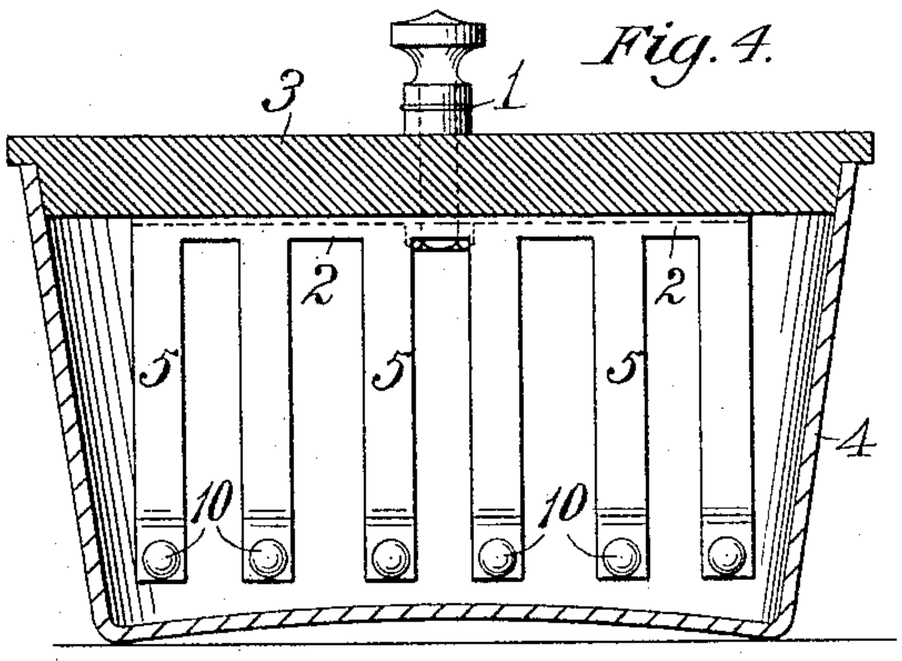


Fig. 5.

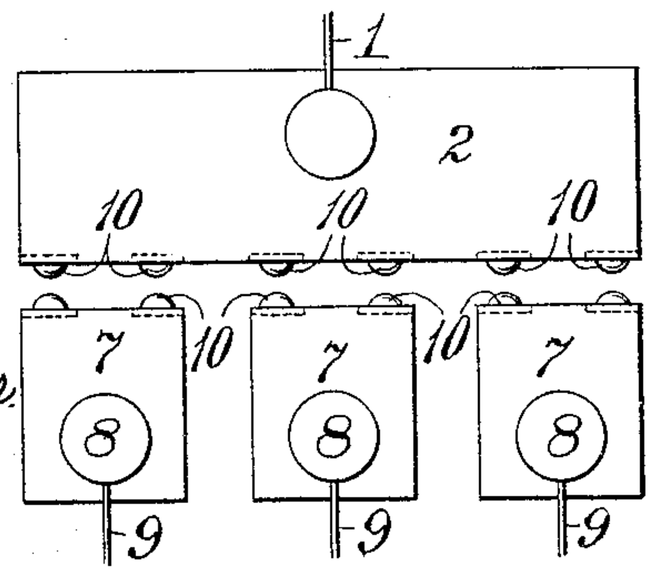


Fig. 6.

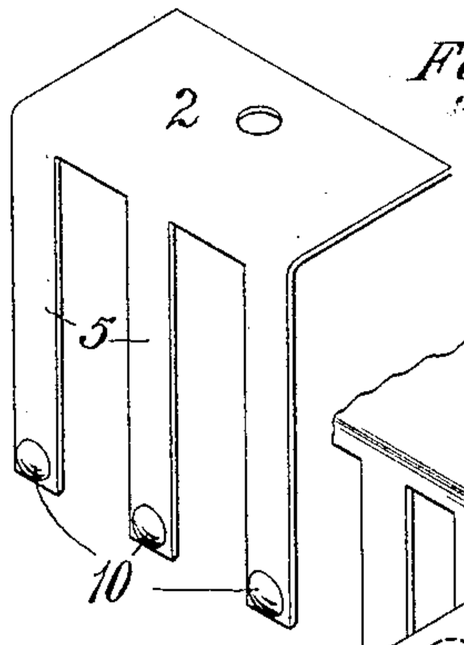
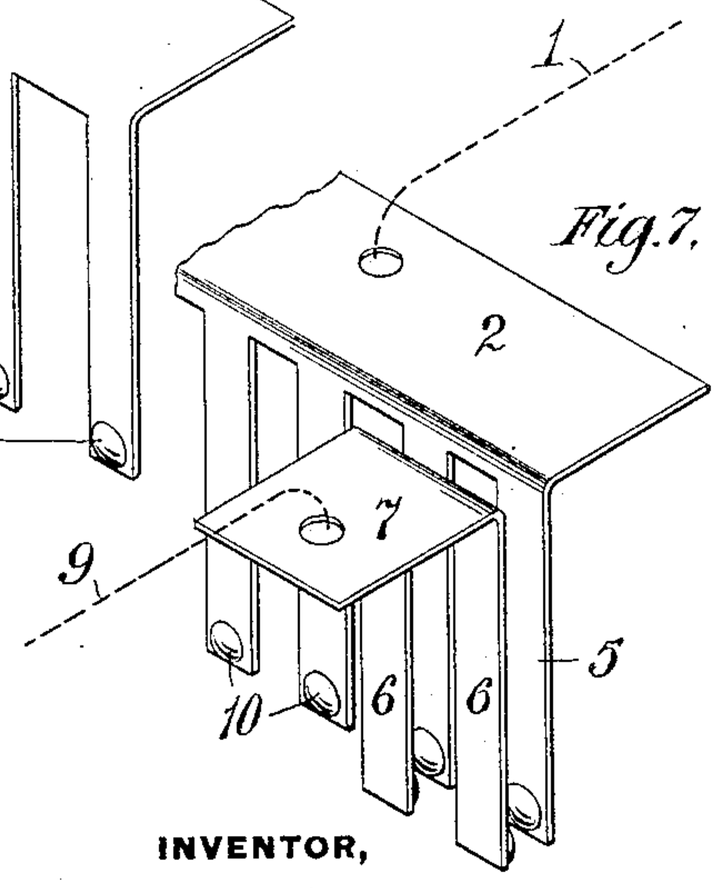


Fig. 7.



WITNESSES:

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F. E. Gaither.

INVENTOR,

John P. Culgan

by Darwin S. Wolcott

Att'y.

UNITED STATES PATENT OFFICE.

JOHN P. CULGAN, OF SWISSVALE, PENNSYLVANIA, ASSIGNOR TO THE UNION SWITCH AND SIGNAL COMPANY, OF SAME PLACE.

LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 571,109, dated November 10, 1896.

Application filed June 1, 1896. Serial No. 593,760. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. CULGAN, a citizen of the United States, residing at Swissvale, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Lightning-Arresters, of which improvements the following is a specification.

The invention described herein has for its object a construction of lightning-arrester for the protection of aerial electric wires of such character that it will afford efficient protection against heavy charges of electricity and will not affect the ordinary working of the lines.

In general terms the invention consists in the provision of a swinging member which shall be attracted to another member in such manner as to form a path for an electric current to ground, and on the change of polarity due to the formation of such electric by-pass a quick separation of the two members will be effected.

The invention is more fully hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation of a form of lightning-arrester embodying my improvement. Fig. 2 is a similar view, the plane of section being taken on the line II II, Fig. 1. Figs. 3 and 4 are sectional elevations illustrating other forms or modifications of my improvement. Fig. 5 is a plan view of the contact-plates of the construction shown in Fig. 4. Figs. 6 and 7 are perspective views of contact-plates.

In the practice of my invention the line-wire 1 is connected by a suitable binding-post to a plate 2, secured to the under side of a lid or cover 3 (preferably formed of insulating material) of the inclosing case or shell 4. To the plate 2 is hinged a pending tongue 5, formed of metal, the hinge connection between the tongue and the plate 2 being such as to present no material resistance to the passage of an electric current. This tongue 5 is so hung within the case or shell that on a slight vibration thereof it will come into contact with another conducting-body, which is connected to the ground. In the construction shown in Fig. 1 this conducting body or member is formed by a metal tongue 6, hinged to a metal plate 7, also secured to the under side of the cap or cover 3 of the shell, but insulated from the plate 2 and its tongue, and is electrically connected by the binding-post 8 to the ground-wire 9. Under normal conditions the tongue 5, being connected to the line-wire, will be positively charged, and the tongue 6, being connected to the ground, will be negatively charged, so that said tongues will be attracted toward each other. These tongues, however, are hung such a distance apart that under a normal charge in the line-wire they will not be drawn into contact with each other, but in case of an abnormal charge in the line-wire the tongues will be sufficiently attracted to be brought into contact or in such proximity to each other that the current will pass from the tongue 5 to the tongue 6 and thence to ground. This passage of the current from one tongue to the other will impart like polarites to said tongues, which will be immediately repelled one from the other, thereby restoring the break between the line-wire and ground. In order to prevent the tongues from being fused together, it is preferred to secure carbon buttons 10 on the ends of the tongues or such parts thereof as will come in contact with each other in the normal operation of the device.

Under ordinary conditions two single tongues 5 and 6 will be ample to protect a single line-wire, but in order to protect a larger number thereof or to insure greater protection a series of two, three, or more tongues may be formed upon the plates 2 and 7, as shown in Fig. 3, and in lieu of hinging the tongues to the plates the former may be formed of resilient metal, so that in case of a strong attraction between two tongues they can move into contact and then spring away when similarly charged. As shown in Figs. 4, 5, 6, and 7, a number of such tongues may be arranged on a ground-plate 7 and a series of line-wires may be connected to independent line-plates 2, said plates 2 and 7 being provided with one or more tongues, as hereinbefore described. It is not necessary that the tongues on both plates should be made of resilient metal, as contact can be formed between the two

tongues if one is rigid, so as to be incapable of swinging movement, while the other has sufficient resiliency or freedom of movement to be drawn into contact with the other stationary tongue.

It is characteristic of my improvement that a constant arc cannot be formed between the two members of the device for the reason that as soon as a current is established between the two members they will be charged with a like polarity and will thereupon repel each other sufficiently far to break any arc which might be formed. In practice it is found desirable to so arrange and construct the tongues that even when they are attracted toward each other they will not come into direct contact with each other, and hence the line-wire will not be entirely grounded, but will continue to receive a portion of the current, thereby preventing an interruption of the working of the line-wire.

I do not limit myself herein to any particular construction or arrangement of the parts of the arrester, as I consider within my invention any construction embodying at least one movable member, which is adapted to be attracted toward or repelled from the other member, one of the members being connected to the line-wire and the other member being connected to the ground.

I claim herein as my invention—

1. In a lightning-arrester, the combination of two members, each provided with a carbon contact face or point, one of which is movable, one member being adapted to be connected to the ground, and the other to the line-wire, said members being arranged in such relation to each other that when the line-wire is normally charged, they will be separated one from the other, but will be drawn toward each other when the line-wire is abnormally charged, substantially as set forth.

2. In a lightning-arrester, the combination of two tongues movable toward and from each other and provided with carbon buttons, said tongues being insulated from each other, and adapted to be connected to ground, and to a line-wire, respectively, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN P. CULGAN.

Witnesses:

DARWIN S. WOLCOTT,

F. E. GAITHER.