

No. 783,388.

PATENTED FEB. 21, 1905.

C. A. ROLFE.
ELECTRICAL CIRCUIT PROTECTOR.
APPLICATION FILED JAN. 2, 1902.

Fig. 1.

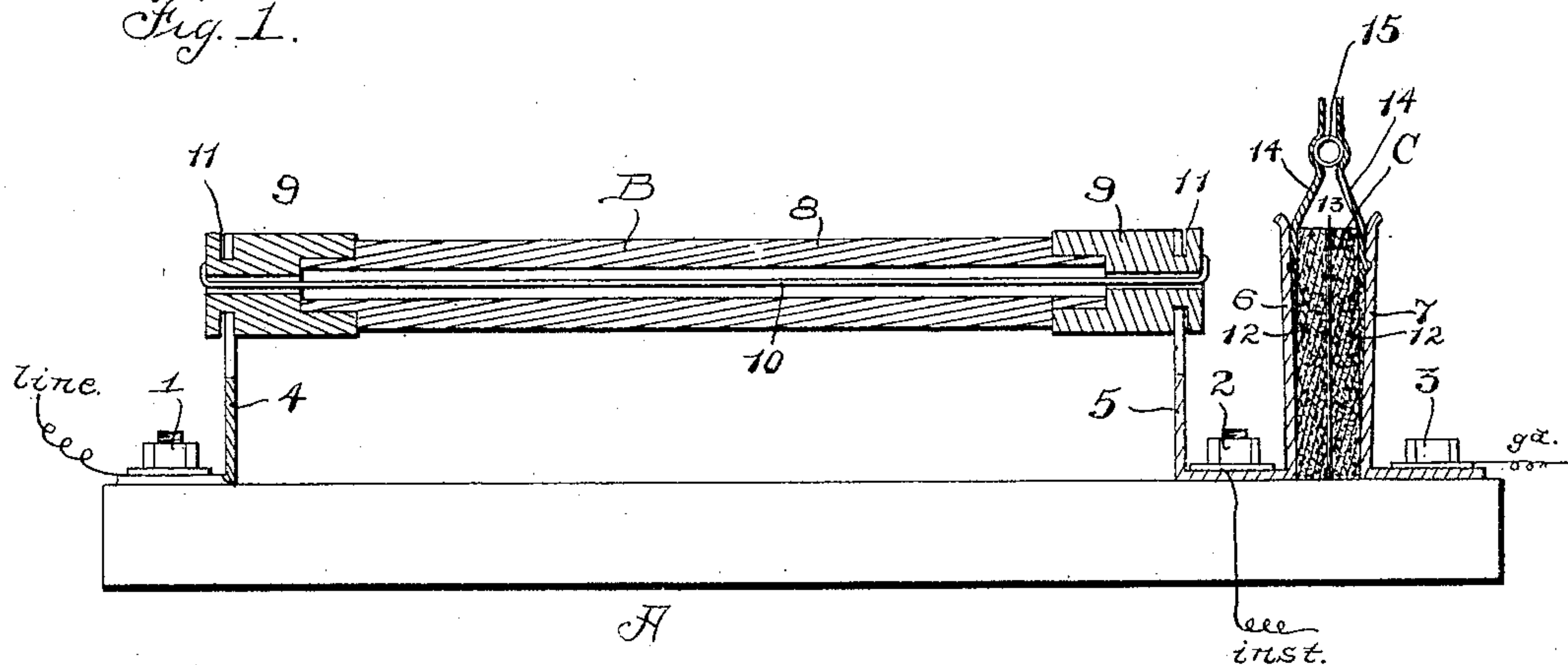


Fig. 2.

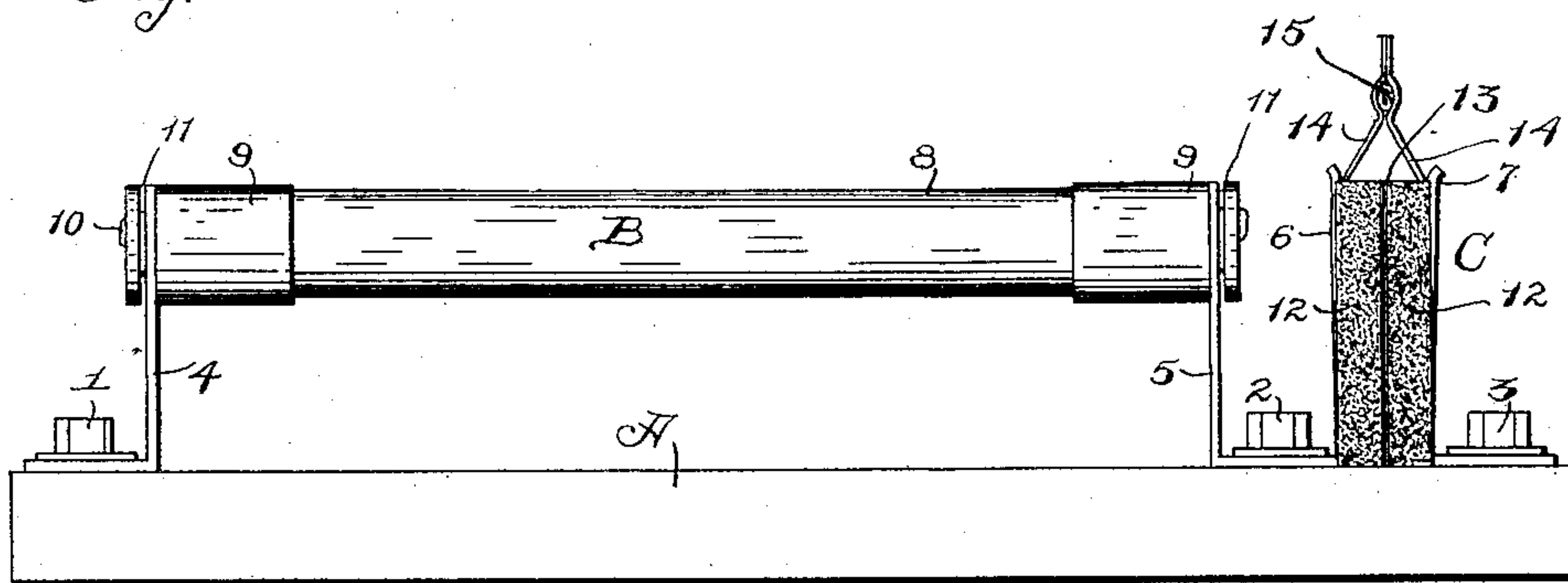
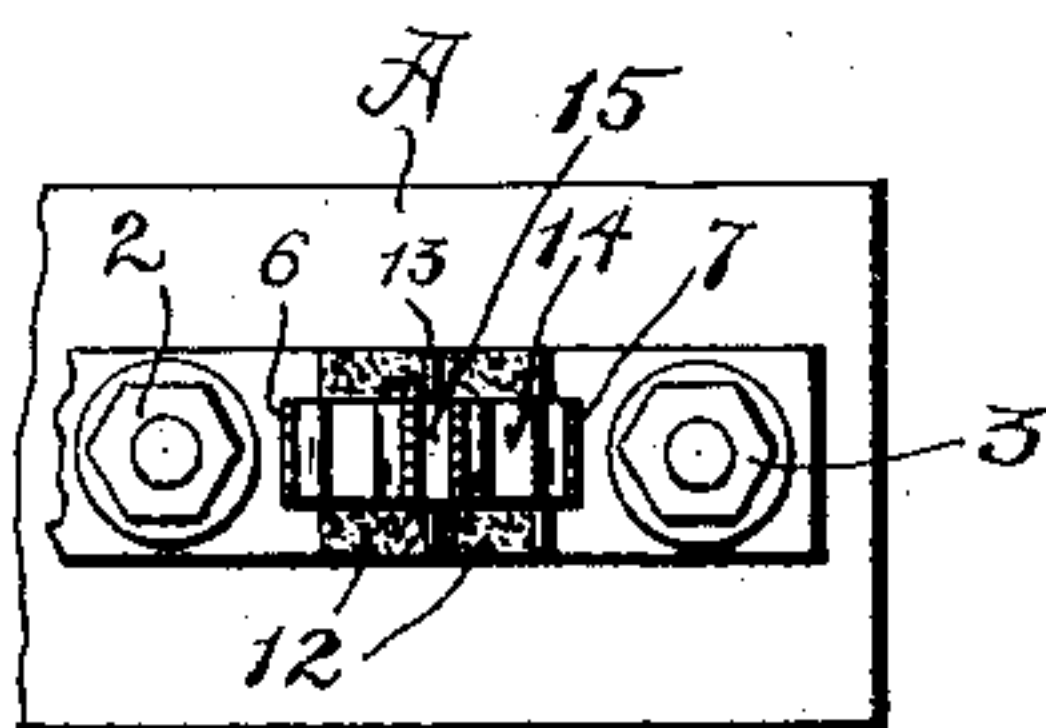


Fig. 3.



Witnesses:
Max H. Zabel.
Harvey L. Hanson.

Inventor.
Charles A. Rolfe,
By Charles A. Brown, Cragg & Regfield
Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES A. ROLFE, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ROLFE ELECTRIC CO., OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

ELECTRICAL-CIRCUIT PROTECTOR.

SPECIFICATION forming part of Letters Patent No. 783,388, dated February 21, 1905.

Application filed January 2, 1902. Serial No. 88,036.

To all whom it may concern:

Be it known that I, CHARLES A. ROLFE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electrical-Circuit Protectors, (Case No. 9,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates in general to apparatus for protecting electrical instruments and circuits from the injurious effects of high potentials and unduly strong currents.

My invention contemplates arranging, as usual, for the breaking or opening of the circuit under ordinary circumstances by the passage of an unduly strong current, and also for the discharge of lightning from the line to ground, and in addition to these two usual results it contemplates the automatic connection of the line with the ground-circuit upon the continuance of a discharge from a high-potential circuit, such as a trolley or an electric-light circuit, so that instead of a persisting high-potential discharge accompanied probably by an arc the line will be positively closed, so that the high-potential circuit will produce an unduly strong current, which will result in the opening of the circuit in the usual way. By this new result it will be seen that the very objectionable feature of a continuous high-potential discharge from an electric light or power circuit is avoided and an unduly strong current which will open circuit is produced.

In the accompanying drawings, Figure 1 is a vertical section of a protective device embodying my present invention in its normal or unoperated condition. Fig. 2 is a side elevation of the same in an operated condition, and Fig. 3 is a plan view of an end portion of the device.

The protective device illustrated in the drawings for carrying out my invention is constructed with an insulating-base A, provided with terminals 1, 2, and 3. The terminal 1 is understood to be connected with the line, the terminal 2 to the instrument, and the terminal

3 to ground, it being understood that the device shown is for but one side of the circuit. The base A is also provided with metallic supports 4 and 5, which are secured to the base by means of the terminal screws 1 and 2 and serve to support a circuit-opening device B. The base is also provided with metallic supports 6 and 7, which are secured to the base by the terminal screws 2 and 3 and serve to support the lightning-arrester C. The circuit-breaking device B could be of any suitable or desired construction; but as a matter of further and specific improvement it consists of a long tubular structure 8, having its ends provided with metallic caps 9 9, and a fuse 10, extended through the tubular structure 8 and also through the caps 9 9, to whose outer ends it is soldered. The caps 9 9 are provided with annular grooves 11 11, which permit them to fit within the bifurcated ends of the supports 4 and 5, thus providing both a solid and substantial connection between the circuit-breaking device and the supporting-contacts 4 and 5, both electrically and mechanically, and also permitting the circuit-breaking device to be easily removed from its supporting-contacts.

The lightning-arrester C desirably comprises a pair of carbon blocks 12 12, disposed between the metallic contacts 6 and 7, and a strip 13 of insulating material, such as paraffin, paper, interposed between the carbon blocks 12 12. In accordance with the manner of carrying out my invention herein shown I provide a couple of metallic spring-clips 14 14, which have their lower ends fitted in between the supporting-contacts 6 and 7 and the outer surfaces of the carbon blocks 12 12 and are so bent as to tend to have their upper ends spring together and make good connection with one another. The upper portions of these spring-clips 14 14 are provided with concave or bent portions forming together a socket, and in this socket is arranged a device susceptible to a moderate degree of heat—such, for example, as a small section 15 of rubber or vulcanite tubing.

The operation of the device is as follows: Upon the passage of an unduly strong cur-

rent the fuse 10 will melt, thereby opening the circuit and preventing trouble to the instrument. When this happens, the fuse can be easily replaced by replacing the circuit-opening device B. When lightning intrudes upon the line, it discharges from the line-carbon 12 to the ground-carbon 12 and passes to ground. In case the line becomes crossed by or connected accidentally with a high-potential circuit, such as a trolley or arc-light circuit, the high potential may pass between the carbon terminals 12 12 to ground, and thus maintain a continuous discharge between these terminals. This of course is exceedingly objectionable. These discharges often persist for a considerable length of time, thereby rendering the line dangerous, especially in the case of telephone-circuits, for in such case a person taking up a telephone instrument is likely to receive a discharge therefrom. In accordance with my invention, however, this continuous discharge between the carbon terminals 12 12 heats them and the metallic contacts 6 7, and thereby heats the spring-clips 14 14 to an extent to soften or melt the rubber tube 15, whereupon the clips 14 14 spring together and make a closed circuit between the supporting-terminals 6 and 7. The line is thereby closed to ground through the lightning-arrester and there immediately develops a sufficiently strong current to operate or blow the fuse 10, and thereby open the circuit. It will thus be seen that provision is made for preventing injury to the line and also for preventing it from remaining in a dangerous condition by reason of a cross or connection with a high-potential circuit, which cross or connection does not itself allow sufficient current to pass to operate the circuit-opening device. It will also

be seen that by my invention spring clips or terminals, such as the clips 14 14, can be readily applied to lightning-arresters now in use, so as to permit the same to be equipped to secure the result of the invention. These clips can be provided for almost any form of lightning-arrester now in use by slightly modifying their shape or construction.

It will be understood that the device herein shown and described is merely set forth as being illustrative of one form of device which can be constructed to carry out my invention. The general arrangement of the device can of course be varied, as can also its various operating parts.

What I claim as my invention is—

1. The combination with a pair of electrodes, of a pair of spring-clips arranged face to face and adapted to spring toward one another, each of said clips being bent so that the two bent portions form a recess between the clips, and a hollow body made of softenable insulating material confined in said recess, substantially as described.

2. The combination with side supports 6 and 7, of electrodes 12, 12, confined between said supports, detachable spring-clips 14, 14, adapted to have their lower ends inserted between the supports 6 and 7, and electrodes 12, 12, said clips 14, 14, being arranged face to face and tending to spring toward one another and being bent so that a recess is formed between them, and a tube-section 15 arranged in said recess, substantially as described.

In witness whereof I hereunto subscribe my name this 25th day of July, A. D. 1901.

CHARLES A. ROLFE.

Witnesses:

A. MILLER BELFIELD,
HERBERT F. OBERGFELL.