

No. 637,794.

Patented Nov. 28, 1899.

T. B. HUGHES.  
LIGHTNING ARRESTER.

(Application filed June 22, 1899.)

(No Model.)

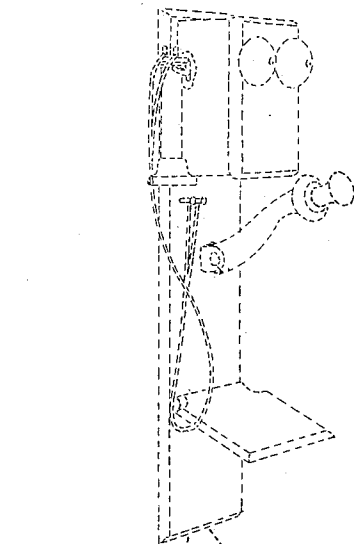


Fig. 1.

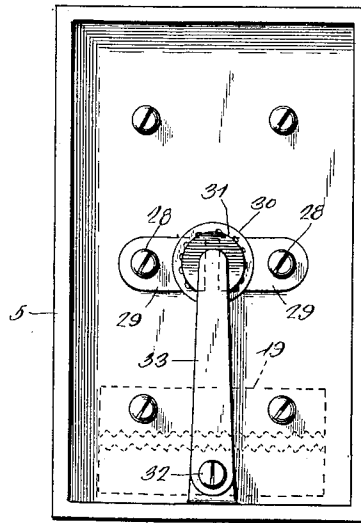


Fig. 3.

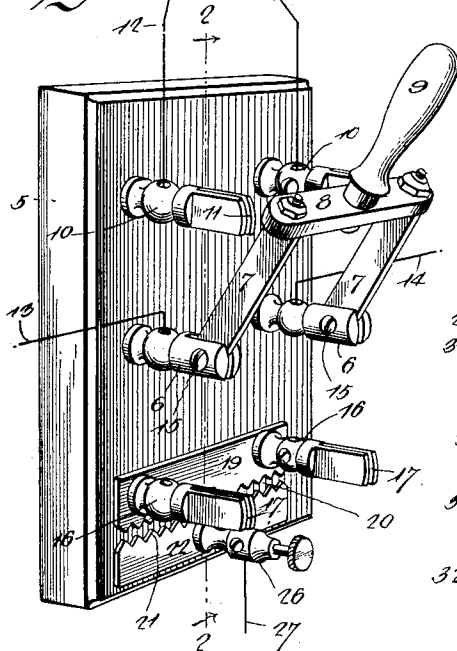


Fig. 2.

Witnesses  
J. Frank Culverwell. By his Attorneys,  
Geo. H. Chanale.

T. B. Hughes, Inventor  
C. A. Snow & Co.

# UNITED STATES PATENT OFFICE.

TALBERT BENSON HUGHES, OF HAWES CROSS-ROADS, TENNESSEE.

## LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 637,794, dated November 28, 1899.

Application filed June 22, 1899. Serial No. 721,485. (No model.)

*To all whom it may concern:*

Be it known that I, TALBERT BENSON HUGHES, a citizen of the United States, residing at Hawes Cross-Roads, in the county of Washington and State of Tennessee, have invented a new and useful Lightning-Arrester, of which the following is a specification.

This invention relates to lightning-arresters, and more particularly to that class employed in connection with a telephone or other delicate instrument susceptible to injury from overcharging of its circuit; and it has for its object to provide means not only for grounding the circuit at times when the line is overcharged directly by lightning, but also to provide means for grounding the sneak-currents.

The invention consists of a base upon which are arranged three pairs of terminals, of which the intermediate pair is connected one with each terminal of the line and carries a knife-switch adapted to alternately engage the terminals of the other pairs. One end pair has each of its elements connected with one end of the local circuit including the instrument to be protected, the elements of the other end pair being mounted upon a conductive plate, one edge of which is separated by a slight interspace from the saw edge of a second plate, which is grounded. Thus the instrument to be protected may be cut into or out of the line, and when the instrument is out of the line the line may be closed through the conductive plate upon which the second pair of end terminals are mounted. When in the last-named position, the lightning-arrester, comprising the mutually adjacent plates mentioned, will act to discharge the excess of current in the usual manner.

In order to guard against sneak-currents, I bridge the lower ends of the line-terminals by means of a carbon disk which is separated from said terminals by means of a very thin perforated disk of mica, the carbon disk having direct connection with the saw-edged plate above mentioned through the medium of a spring-finger connected with said plate and bearing directly against the outer surface of the carbon disk, thus grounding the disk.

In the drawings forming a portion of this

specification and in which like numerals of reference designate corresponding parts in the several views, Figure 1 is a perspective view showing my lightning-arrester and its connections. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a view of the under side of the arrester, certain parts carried by the upper side of the base being shown in dotted lines.

Referring now to the drawings, 5 represents a base, of porcelain or other suitable insulating material, intermediate the ends of which is fixed a pair of binding-posts 6, having vertical slots in their upper ends, in which are journaled the knives 7 of a knife-switch comprising a cross-piece 8, of insulating material, and a handle 9, and which knives are adapted to enter slots in the corresponding terminals represented by binding-posts arranged at either side of the posts 6. At one side of the posts 6 is a pair of terminals comprising binding-posts 10, the upper ends of which are bifurcated, as shown at 11, for the reception of their respective knives 7, said binding-posts 10 having direct connection with the wires 12 of a local circuit including the instrument to be protected. The posts 6 form terminals of a line comprising wires 13 and 14, connected therewith and held in place through the medium of set-screws 15 in the usual manner, and thus when the knives 7 are in engagement with posts 10 the instrument to be protected is in circuit in the line. At the opposite sides of the posts 6 is arranged a pair of terminals 16, having their upper ends serrated, as shown at 17, to receive their respective knives 7 when the latter are moved into engagement therewith. The posts 16 are mounted directly upon and are in electrical connection with a plate 19, secured to the base 5 and separated by an interspace 20 from the saw edge 21 of a plate 22, secured directly to the base 5. This plate 22 has a binding-post 26 in electrical connection therewith and from which binding-post leads a ground-wire 27. Thus when the knives 7 are in engagement with the posts or terminals 16 the line will be closed through the plate 19, and upon the line receiving an excessive charge a discharge will be made across the interspace 20 to the plate 22 and thence through the wire 27 to the ground.

The mechanism above described is intended for operation in the presence of a heavy storm; but it is of course desirable to provide means for discharging the line while the instrument to be protected is in circuit with the line.

As shown in Figs. 2 and 3, the posts 6 are secured upon the base 5 through the medium of screws 28, passed upwardly through the base, and through the medium of these screws I attach to the under side of the base two plates 29, the adjacent ends of which are separated. Upon the lower faces of plates 29 I arrange a thin mica disk 30, which is perforated, and directly upon said disk I arrange a carbon disk 31, the periphery of which overlaps the adjacent ends of the plates 29, the perforations in the mica disk being closed at one end by the plates 29 and at the other end by the disk 31.

As shown, the binding-post 26 and plate 22 are held upon the base 5 by means of a screw 32, passed upwardly through the base and drawing the binding-post downwardly upon the plate. Upon the screw 32 and intermediate its headed lower end and the under surface of the base 5 is the end of a spring finger or plate 33, of conductive material, the free end of said plate or finger bearing directly upon the under surface of the carbon disk 31 and holding it and the mica disk firmly in position.

It is of course understood that all parts of this device are of brass or other suitable conductive material with the exception of the parts otherwise specified and the handle 9. Thus in an overcharge of the line, while the instrument is in circuit, there will be a discharge from plates 29 to the disk 31 and plate 33 to screw 32 and binding-post 26 through the wire 27 to the ground. This path will also be accessible when the switch is in connection with the posts or terminals 16, as will be readily understood. It will be, furthermore, understood that I may vary the position and location of the different parts of the construction and that I may vary the specific forms herein shown and described without departing in any way from the spirit of the invention.

Having thus described the invention, what is claimed is—

1. A lightning-arrester, comprising a base, line-terminals carried by the base, a switch element carried by each line-terminal, local terminals carried by the base and adapted for

engagement by the switch elements, additional terminals carried by the base and in mutual electrical connection and adapted to receive the switch elements when disengaged from the local terminals, to close the line-circuit, a ground-plate carried by the base and separated from the connection of said additional terminals by an interspace, a plate connected with each line-terminal below the base, a perforated mica disk in contact with both plates, a conductor in contact with the disk, bridging the plates and isolated therefrom, a spring-finger engaging the conductor and adapted to hold it and the disk in position, and a ground connection with the finger.

2. A lightning-arrester comprising a base, line-terminals carried by the base, a switch element carried by each line-terminal, local terminals carried by the base and adapted for engagement by the switch elements, additional terminals carried by the base and in mutual electrical connection and adapted to receive the switch elements when disengaged from the local terminals, a conducting-plate arranged to bridge the line-terminals and separated therefrom at intervals by an insulating medium, and a ground connection for said conducting-plate.

3. A lightning-arrester comprising a base, line-terminals carried by the base, a switch element carried by each line-terminal, local terminals carried by the base and adapted for engagement by the switch elements, additional terminals carried by the base and in mutual electrical connection and adapted to receive the switch element when disengaged from the local terminals, a ground-plate carried by the base and separated from the connection of said additional terminals by an interspace, a ground connection for said ground-plate, plates connected with the line-terminals and lying mutually adjacent, a conductor bridging the last-named plates and separated therefrom at intervals by an insulating medium, and a ground connection for said conductor.

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

TALBERT BENSON HUGHES.

Witnesses:

E. R. ALLEN,  
T. P. PERSINGER.