No. 721,939. PATENTED MAR. 3, 1903.

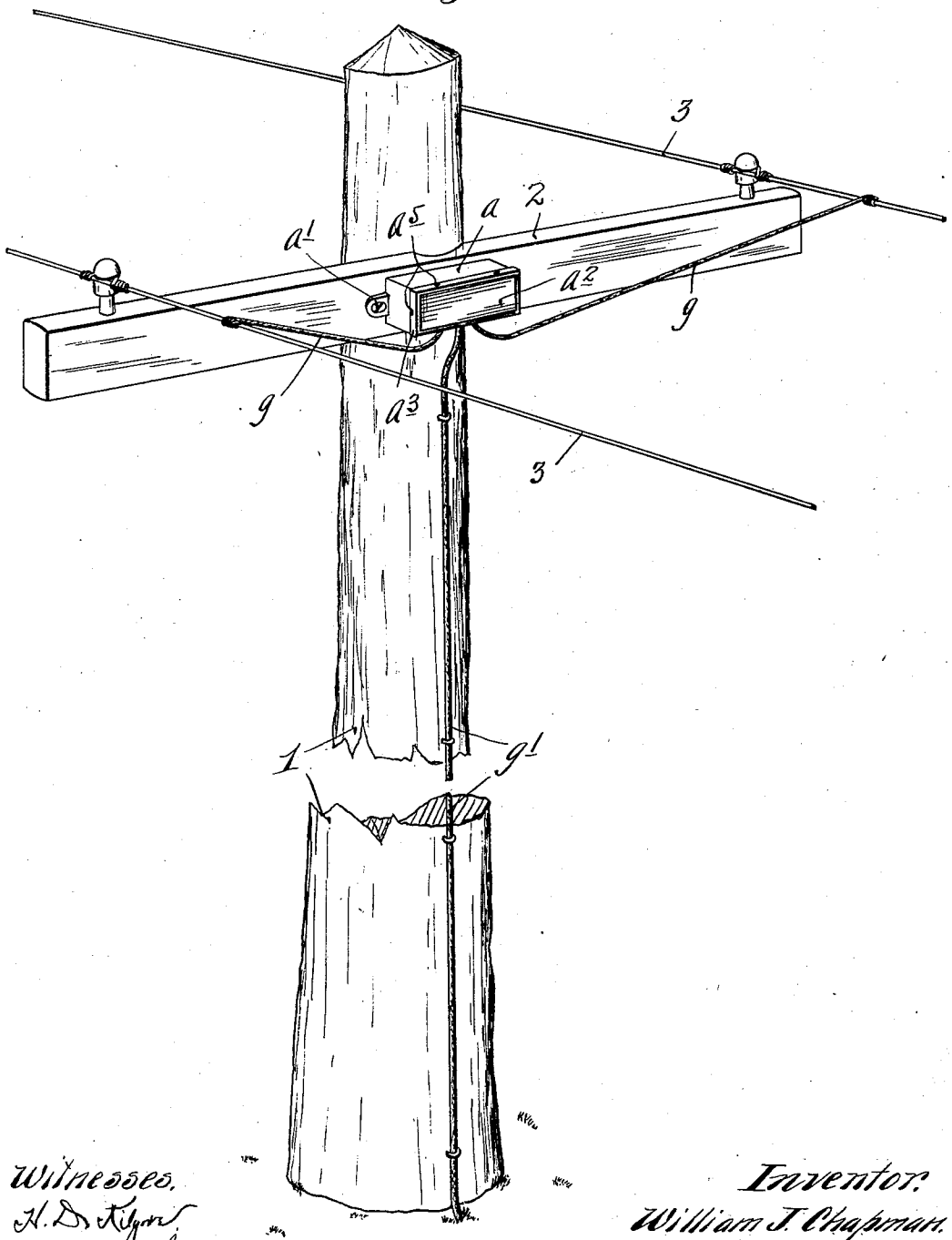
W. J. CHAPMAN.

LIGHTNING ARRESTER.

APPLICATION FILED APR. 19, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



Witnesses.
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No. 721,939. PATENTED MAR. 3, 1903.

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LIGHTNING ARRESTER.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

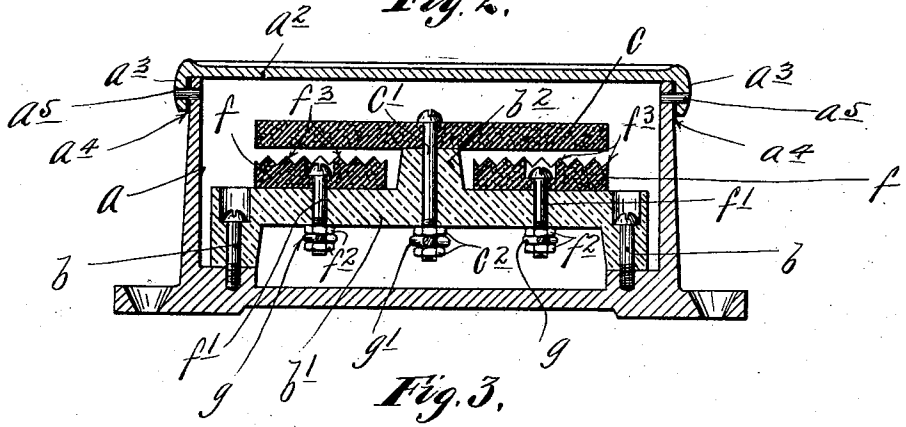


Fig. 3.

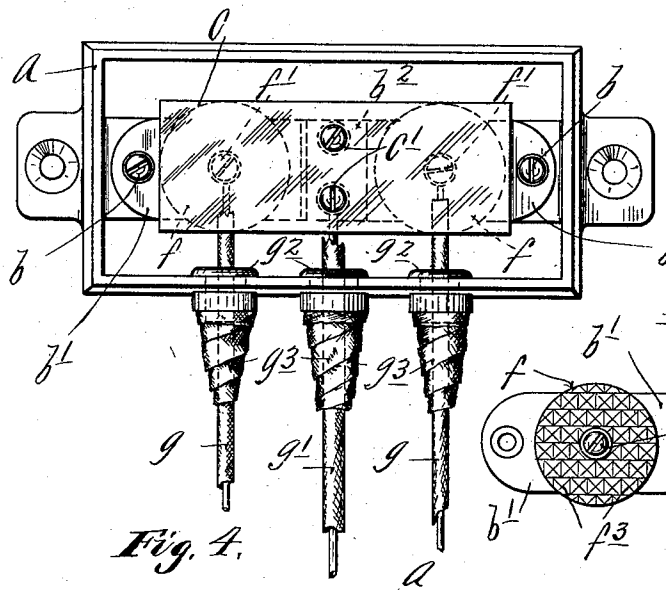
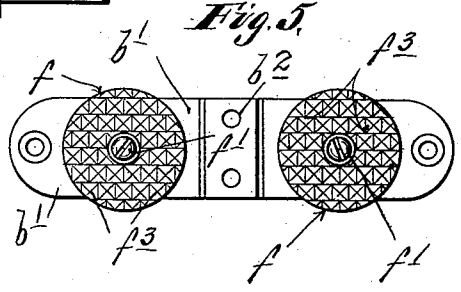
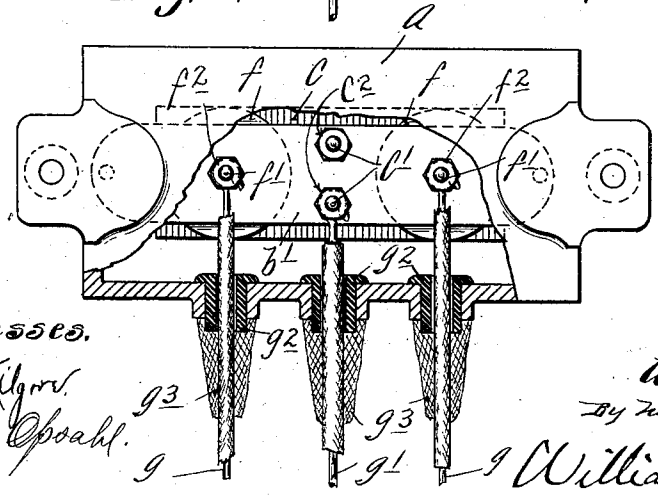


Fig. 4.

Fig. 5.





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UNITED STATES PATENT OFFICE.

WILLIAM J. CHAPMAN, OF MINNEAPOLIS, MINNESOTA.

LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 721,939, dated March 3, 1903.

Application filed April 19, 1902. Serial No. 103,735. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. CHAPMAN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Lightning-Arresters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved lightning-arrester especially adapted for use in connection with telephone and telegraph lines, but adapted also for more general use wherever a lightning-arrester may be required. The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a perspective view showing an ordinary telegraph or telephone pole with line-wires supported therefrom by an ordinary cross-arm and showing also my improved lightning-arrester in operative position. Fig. 2 is a horizontal section taken centrally through the lightning-arrester. Fig. 3 is a front elevation of the lightning-arrester with the front plate of the case removed. Fig. 4 is a front elevation of the complete lightning-arrester, some parts being broken away and others being shown in section; and Fig. 5 is a face view or elevation showing in detail the so-called "insulating-bridge" and electrodes secured thereto.

The numeral 1 indicates the telephone or telegraph pole, the numeral 2 the cross-arm thereof, and the numeral 3 the line-wires.

The parts of the lightning-arrester proper are inclosed within a water and air tight case afforded, preferably, by a rectangular metal box a, having a flanged base which is adapted to be secured to the cross-arm 2 or elsewhere by means of screws a'. The outer vertical face of the case or box a is adapted to be closed by means of a cover or plate a^2, having flanges a^3, which embrace the sides of the box a, as best shown in Fig. 2. Between the flanges a^3 of said cover a^2 and the embraced portion of the box a a waterproof packing or filling of putty or any other suitable material is placed, as indicated at a^4, to form a water-tight joint. The cover a^2 is normally held in place by means of pins a^5, which are driven through perforations in its flange a^3 and in the embraced edge of the box a. To remove the cover, it is necessary to first drive the pins a^5 inward and into the box a.

Rigidly secured within the box a by means of screws b or other suitable devices is an insulating-bridge b', preferably of porcelain. At its central portion the bridge b' is provided with a hub or spacing-lug b^2, to which is rigidly but detachably secured a transversely-extended electrode c, preferably afforded by a flat plate or bar of carbon. As shown, this electrode c is thus secured to the hub of the bridge b' by means of a metal bolt c', provided at its screw-threaded end with a pair of nuts c^2. Also secured to the insulating-bridge b' there is, as shown, a pair of disk-like electrodes f, located one on each side of the hub b^2. As shown, the electrodes f are secured to the said insulating-bridge by means of metal bolts f', provided at their screw-threaded ends with pairs of nuts f^2. The faces of the electrodes f are serrated in two directions—that is, are formed with a multiplicity of closely-spaced pyramidal projections or points f^3, which terminate close to the adjacent inner face of the electrodes c, but are spaced apart therefrom, so that the circuit will normally be broken. The distance between these points and the adjacent face of the electrodes c should be such that the current which normally passes through the line-wire will not jump across, and of course a reasonable factor should be allowed for safety. In the illustration given in the drawings each of the line-wires 3 is connected to one of the electrodes f by a wire g, one end of which is, as shown, clamped between the coöperating pairs of nuts f^2. The bolt c', and hence the electrodes c, are grounded by a wire g', the upper end of which is, as shown, clamped between the nuts c^2. The wires g and g' are passed outward through insulating-bushings g^2 in the bottom of the box a.

g^3 indicates a wrapping of insulating material wound around the upper portions of the wires g g' and the lower ends of the bushings g^2 to form water or moisture tight joints at such points.

As is evident, when one of the line-wires is

struck by lightning the abnormally high electrical charge will run along the wire until it comes to the first connecting-wire g, through which it will pass and leaping across from the connected electrode f to the common electrode c will pass to the ground through the bolt c' and ground-wire g'. The pointed or serrated faces of the electrodes f give a very much greater aggregate discharging surface than would be given by a flat surface of the same cross-section. Furthermore, the series of vertical grooves afforded by the said points give increased clearance for permitting any scales or fragments which may be broken from the electrodes from time to time either by the action of lightning or from other causes to fall from between the electrodes to the bottom of the box, and thereby prevent short-circuiting between the electrodes. This is an important feature. The electrodes being inclosed in an air and moisture tight compartment are of course protected from the action of the water and other elements.

It will of course be understood that the device above described is capable of considerable modification within the scope of my invention as herein set forth and claimed. For instance, the number of electrodes f may be increased or decreased. If increased in number, then for coöperation therewith there should be provided an electrode c either of greater length or greater width, so as to overlie or cover the several electrodes f. There should, of course, be one electrode f for each line-wire.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

In a lightning-arrester, the combination with a moisture-proof case having a detachable cover or side, of the insulating-bridge b' detachably secured within said case and having the hub or lug b^2, the extended electrode c secured to said lug b^2 by nutted bolt c', the electrodes f secured to said bridge b' by nutted bolts f' and provided with faces formed with pyramidal projections, and the leads or wires g g' connected, respectively, to said bolts f' and c' and passed outward through insulated moisture-proof joints in the said case, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM J. CHAPMAN.

Witnesses:
ELIZABETH KELIHER,
F. D. MERCHANT.