(No Model.) 2 Sheets—Sheet 1.

J. E. NOBLE.

COMBINED INSULATOR AND LIGHTNING ARRESTER.

No. 280,324. Patented June 26, 1883.

Fig. 1.

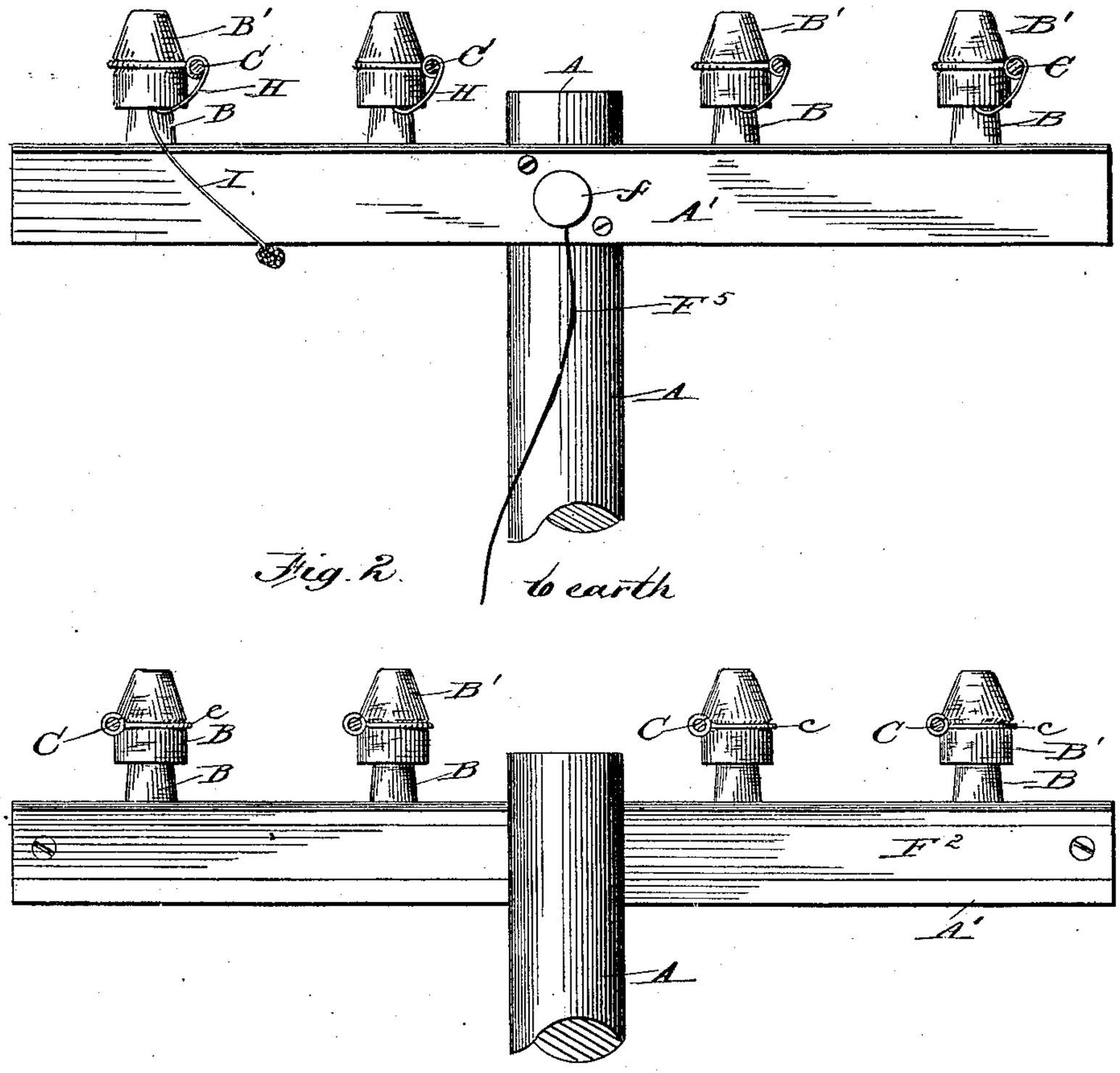
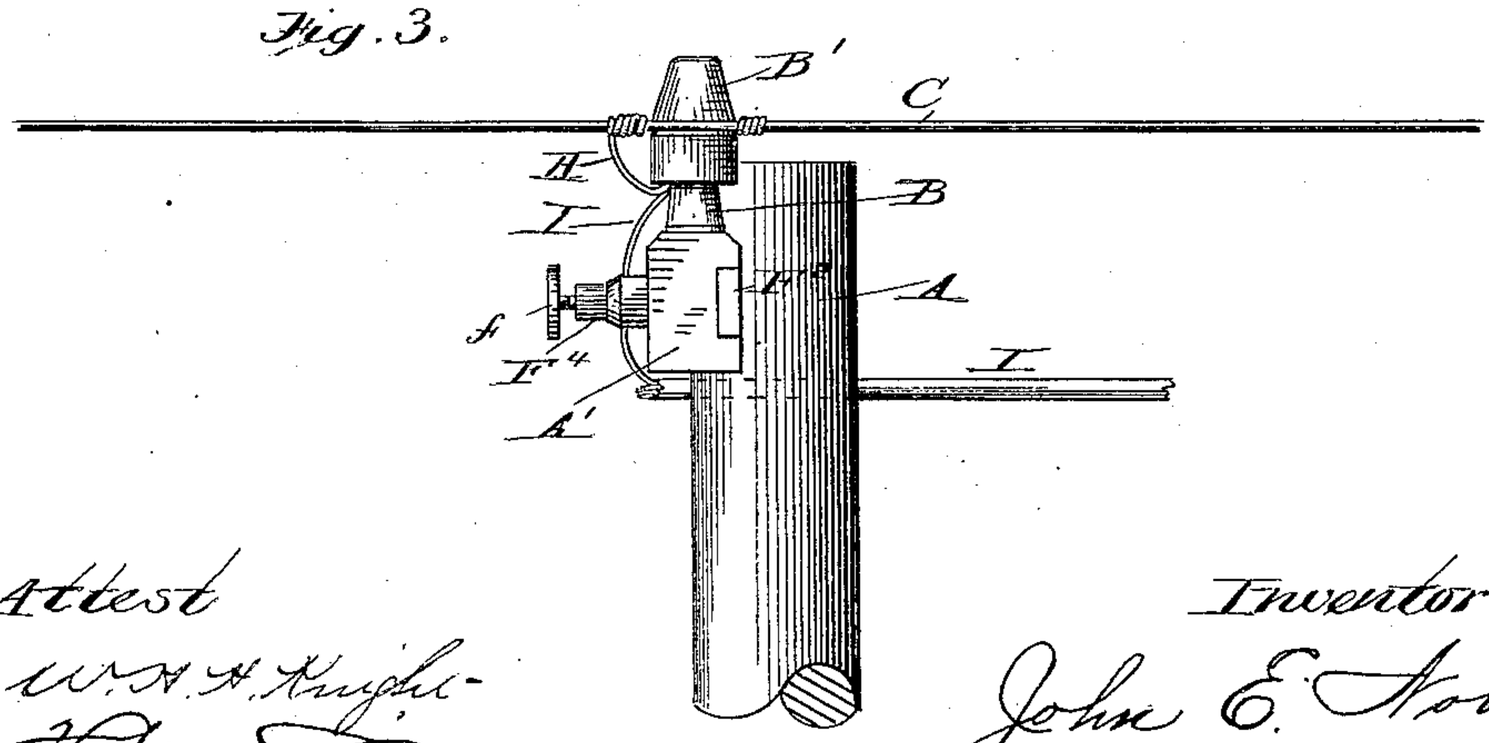


Fig. 2.

Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4

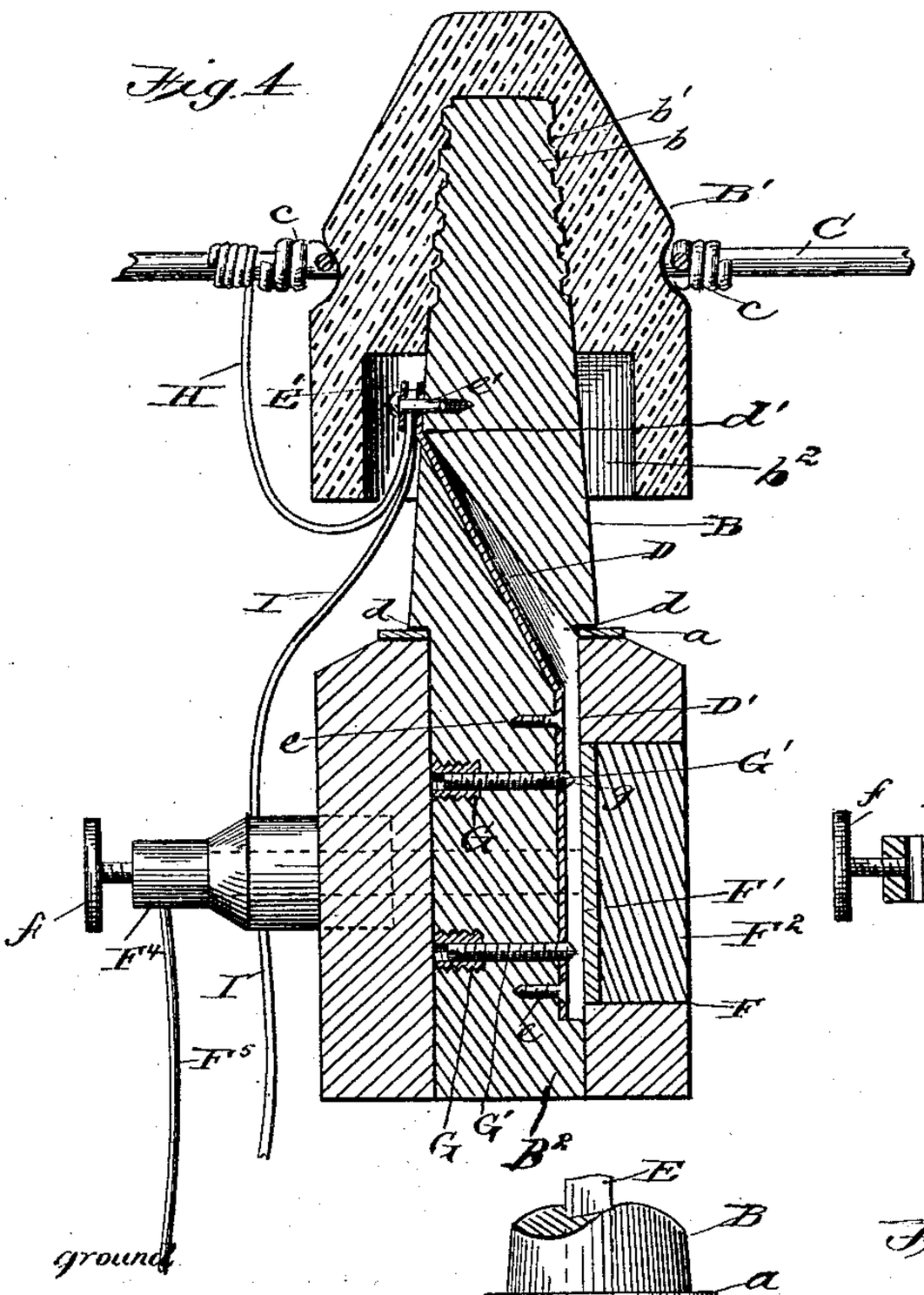


Fig. 5.

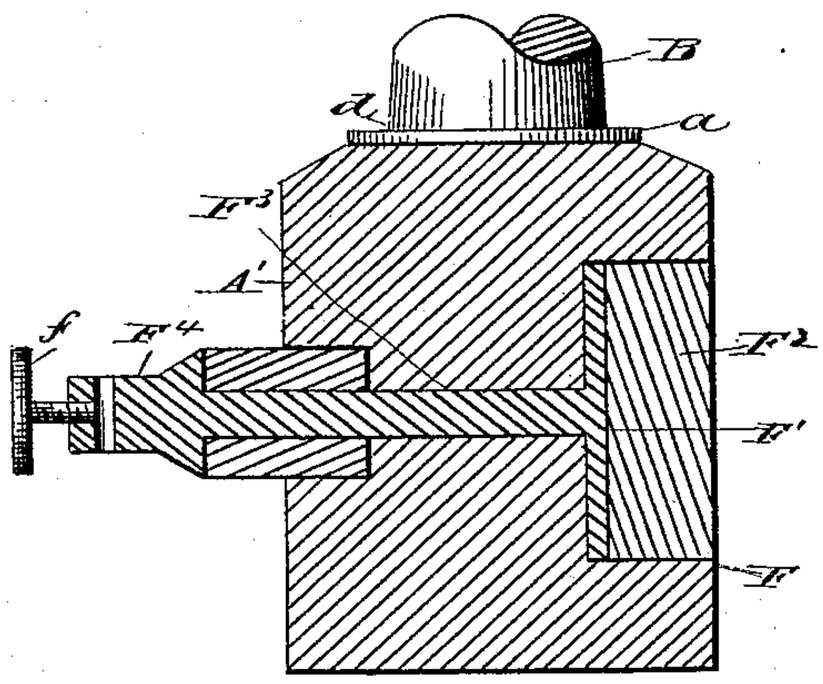


Fig. 6

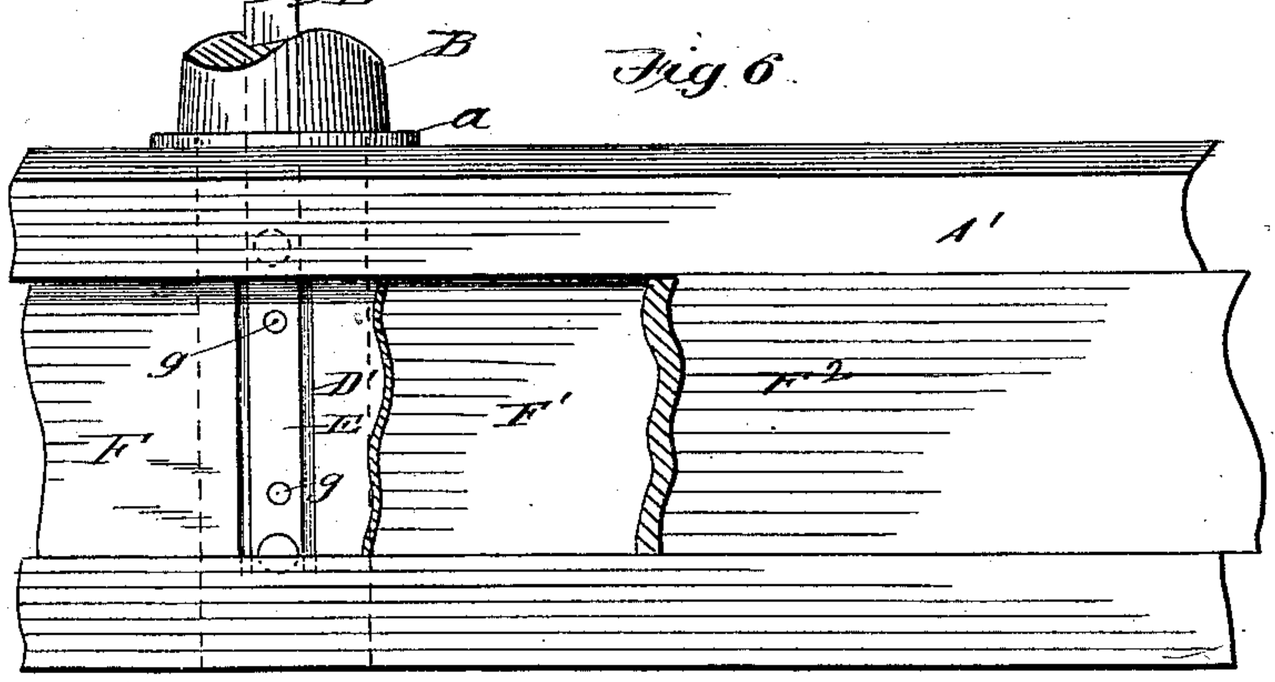
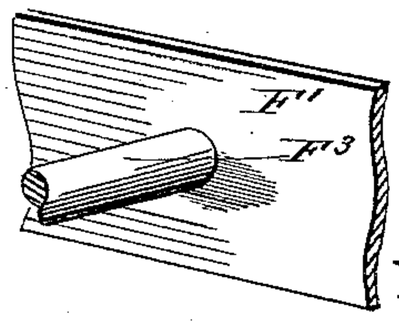


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN E. NOBLE, OF MULBERRY, OHIO, ASSIGNOR OF ONE-SIXTH TO CHARLES J. LEMING, OF SAME PLACE.

COMBINED INSULATOR AND LIGHTNING-ARRESTER.

SPECIFICATION forming part of Letters Patent No. 280,324, dated June 26, 1883.

Application filed April 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. NOBLE, a citizen of the United States, residing at Mulberry, in the county of Clermont and State of Ohio, have invented certain new and useful Improvements in a Combined Insulator and Lightning-Arrester; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to a combined telegraph-wire insulator, lightning-arrester, and connector for electrical conductors; and to this end it consists in the construction and arrangement of the various parts, as will be hereinafter fully described, and pointed out in the claims.

The invention, so far as regards the lightning-arrester, is based upon the well-known fact that discharges of atmospheric electricity or lightning will take the shortest route to the ground, and will in so doing pass through poorer conductors than telegraph-wire, or leap spaces that electricity generated by the fluid-batteries used at telegraph-stations cannot leap.

The accompanying drawings, which form a part of this specification, show clearly the manner in which I utilize the fact above set forth, and also show my method of connecting electrical conductors to the telegraph-wires already in place.

In said drawings, Figure 1 represents a portion of a telegraph-pole having wire-supporting arms connected thereto and provided with my improvement. Fig. 2 represents a similar view taken from the opposite side of the wire-supporting arm. Fig. 3 represents an end view of said arm. Fig. 4 represents a vertical section taken through the insulator, its supporting-pin, and the cross-arm, and shows the lightning-arresting devices, also the manner of connecting branch wires to the main line of wire. Fig. 5 is a transverse sectional view taken through the wire-supporting arm, and showing the ground-connection of the lightning-arrester. Fig. 6 represents a front elevation of a portion of the wire-supporting arm, partly in section to show lightning-arresting devices; and Fig. 7 represents a perspective view of a portion of the conducting-plate of the lightning-arrester and the ground-connection thereof.

Similar letters of reference in the several drawings denote similar parts.

Referring to the drawings, A represents a telegraph-pole provided with the usual cross or wire-supporting arm, A′. The arm A′ carries any desired number of insulator supports or pins, B, tapering in form, above the cross-arm A′, and provided at their upper ends with male screws *b*, that take into female screws *b′* within the insulators B′. The pins or supports B are provided at or near their middles with shoulders *d*, that rest upon rubber washers *a*, placed upon the tops of the cross-arms A′. The lower portions, B^2, of the supports B pass down through apertures provided in the cross-arms A′, as shown.

B′ represents the insulators, of glass and in the usual form.

C represents the line-wires, held in position upon the insulators B′ by binding-wires *c*, in the usual manner.

D represents mortises or apertures extending from the shoulders *d* of the pins or supports B, through said pins in an upward direction, and terminating upon the opposite sides of the pins at points *d′*, within the chambers b^2, formed by the overhanging lower portions of the insulators B′ about the pins B. The mortises or apertures D are somewhat larger at their lower than at their upper ends, and at said lower ends they open into slots D′, formed in one side of the lower portions, B^2, of the said pins.

E represents metal strips secured within the slots D′ by screws *e*, and extending thence upward through the mortises D, their upper ends being pierced by contact-screws *e′*.

E′ represents contact-plates placed upon the shanks of the screws *e′*, outside of the strips, as shown, Fig. 4, for a purpose hereinafter to be explained.

G represents screw-blocks secured in the side of the shanks B^2, opposite the metal strips E. The blocks G are perforated, and are provided with female screws, that engage with corresponding male screw-threads upon ad-

justing-pins G′, that pass through the shanks B^2 and metal strips E, their points *g* terminating a short distance from a metal plate, F′, secured within a recess or groove, F, in one of the side faces of the arm A′. The plate F′ extends from end to end of the groove F, thus being common to each and all of the adjusting rods or pins G′ of the shanks B^2. The plate F′ is provided at or near its middle with a projecting metal rod, F^3, that passes from said plate through the arm A′, and terminates at its outer free end in a screw-cup, F^4, from which extends a conducting-wire, F^5, to the earth. The wire is held to the cup by a thumb-screw, *f*.

F^2 represents a wooden strip placed and held within the groove F, outside of the plate F′, by screws, the plate thus being protected from the weather.

It will be observed that the back of the groove opens into the vertical apertures provided in the arm A′ for the reception of the shanks B^2 of the pins B, thus allowing free passage for electric currents from the strip E to the plate F′.

H represents wires in electric contact with the line-wires C, and extending thence to and secured between the contact-plate E′ and the upper end of the metal strip E.

The operation of my improved lightning-arrester is as follows: When the line-wire C is struck by lightning or atmospheric electricity, said electricity will pass along the line until it reaches a pole provided with the above-described ground-connection, where, taking the wire H, it passes down said wire and its connected strip E to the points *g* of the pins G′. From said points *g* it leaps across the space between said points and the plate F′ to said plate. From thence it passes by the rod F^3 and wire F^5 to the earth.

From the above description it will be observed that the metal plates E F′ are kept at all times in a dry condition, while the only external exit of said strip—*i. e.*, at the point *d*′—is protected from dampness by the overhanging lower portion of the insulator B′.

When desired, branch wires may be connected to the main-line wires C, as follows: Let I represent the end of a branch wire. Said wire is carried to and placed between the contact-plate E′ and spring or metal plate E, in electrical contact with said plate and spring. Currents from a fluid-battery—such as is in common use at telegraph-stations—will pass through the wire I to the contact-plate E′, thence through the wire H to the line-wire C, or in contrary direction.

The addition of the wire I does not in any way affect the operation of the lightning-arrester, from the fact that lightning always takes the shortest route to the earth and will leap the space between the points *g* of the rods G′ and the plate F′, while the current passing along the wires from the fluid-batteries will only pass from said wires at points where perfect electric contacts are made.

Having thus described my invention, what I claim, and desire to protect by Letters Patent, is—

1. In a combined insulator and lightning-arrester, the combination of the insulator B′, insulating-pin B, provided with mortise D and slot D′, with the arm A′, post A, and means, substantially as described, for conducting atmospheric electricity to earth, as set forth.

2. In a combined insulator and lightning-arrester, the combination of the insulator B′, mounted upon a pin or support, B, with the metal strip E, and means for connecting said strip E with the line-wire C, plate F, and the ground, substantially as described.

3. In a combined insulator, lightning-arrester, and connector, the combination of the insulator mounted upon the insulating-pin B, provided with metal strip E, electrically connected by a wire, H, with the main line C, with the arm A′, provided with means, substantially as described, whereby atmospheric electricity may be conducted from said line-wire C, through the wire H and strip E, to the earth, substantially as described.

4. In a combined insulator, lightning-arrester, and connector, the combination of the insulator B′, mounted upon the insulating-pin B, provided with metal strip E, screws *e*, contact-screw *e*′, contact-plate E′, and adjusting-screws G′, with the arm A′, provided with groove F, and metal strip F′, protected from weather by wooden strip F^2, and having metal rod F^3, provided at its end with screw-cup F^4, whereby to attach the ground-wire F^5, substantially as described, and for the purpose specified.

5. The combination of an insulator, B′, line-wire C, and means for conducting atmospheric electricity to and from plate F′, with the post A, cross-arm A′, provided upon one side with groove F, extending from end to end of the arm, plate F′, and wooden strip F^2, said arm being also provided with vertical perforations to receive the shanks of the insulator-pins, said perforations opening at one side into the groove F, substantially as shown and described.

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

JOHN E. NOBLE.

Witnesses:
C. J. LEMING,
CORA POOL.