

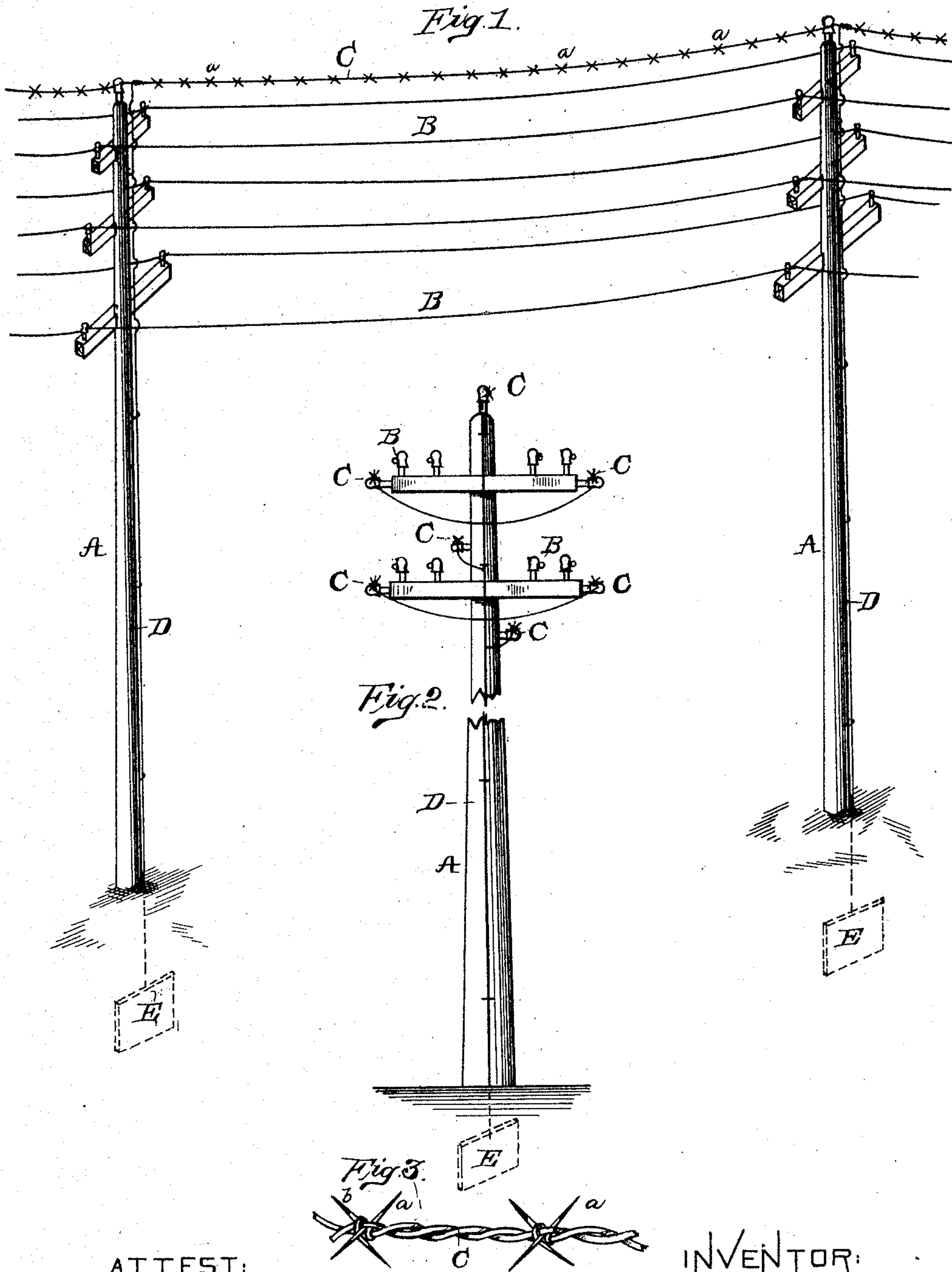
(No Model.)

J. H. VAIL.

LIGHTNING PROTECTOR FOR ELECTRICAL CONDUCTORS.

No. 357,050.

Patented Feb. 1, 1887.



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UNITED STATES PATENT OFFICE.

JONATHAN H. VAIL, OF NEW YORK, N. Y.

LIGHTNING-PROTECTOR FOR ELECTRICAL CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 357,050, dated February 1, 1887.

Application filed June 2, 1886. Serial No. 203,901. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN H. VAIL, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Lightning-Protectors for Electrical Conductors, of which the following is a specification.

The object of my invention is to protect overhead lines of conductors, especially those of electric-lighting systems, from lightning. Ordinarily during a thunder-storm such lines will become charged with atmospheric electricity which will finally discharge itself, and so injure the generators or the lamps in an electric-lighting system or such apparatus as may be used in other electrical systems. To obviate this ground-connections have been provided through a high resistance, usually an air-space, so that the discharge will take place to earth across such resistance without injury to the apparatus. It is found, however, in practice that with such an arrangement the lightning is not always carried off with sufficient quickness to prevent the injurious effect mentioned.

My invention consists, mainly, in employing one or more conductors separate from the circuit-conductors and placed above or otherwise in proximity to such conductors, and connected at intervals by low resistance-connections with the earth, so that the separate conductor or conductors accumulate the atmospheric electricity and cause it to be conveyed continually and safely to the earth. I prefer to provide such lightning-conductors with numerous projecting points, whereby they will more readily collect the electricity, and to this end I may make such conductors of wire of the nature of ordinary barbed fence-wire.

My invention is illustrated in the accompanying drawings.

Figure 1 is a view of an overhead line provided with my invention, where only one lightning-conductor is used; Fig. 2, an elevation of a pole, showing an arrangement where several are used; and Fig. 3, an illustration of a form of barbed wire which I may use.

A A represent poles, which support in the

usual manner circuit-wires B B. These are the wires of electric-lighting systems or other electrical systems in which round metallic circuits or circuits without ground-connections are employed.

C C are the conductors for the lightning or atmospheric electricity. Such conductors may be of ordinary barbed wire—such, for instance, as shown in Fig. 3—or the points or spurs *a a* may be secured upon the wire in any other suitable way. I may, however, use wires unprovided with any such points or spurs.

In Fig. 1 only one lightning-conductor is shown, the same being supported upon the tops of the poles above the circuit-wires upon suitable insulators. This conductor is connected at intervals to the ground by wires D, such wires being preferably connected to copper plates E, buried in the earth at a sufficient depth to be always subject to moisture.

In Fig. 2 a number of lightning-conductors are shown placed upon insulators above, below, between, and by the side of the circuit-wires, so that such wires are surrounded by the lightning-conductors. All these lightning-conductors are connected to the ground-wires D. Such ground-wires are placed at suitable distances apart. There may be one at each pole or at alternate poles, or connections may be made to earth between the poles, if desired.

The lightning-conductors may be of copper, of galvanized iron, or of other suitable metal. I prefer copper, because of its superior conductivity. The points may be plated with nickel or other metal not likely to be corroded by exposure, as shown at *b*, Fig. 3.

What I claim is—

1. The combination of one or more overhead circuit-conductors having no ground-connections with one or more independent grounded lightning-conductors situated in proximity thereto, substantially as set forth.

2. The combination, with a line of poles, of circuit-conductors having no ground-connections and independent grounded lightning-conductors supported thereby, substantially as set forth.

3. The combination, with overhead circuit-conductors having no ground-connections, of

several independent grounded lightning-conductors surrounding said circuit-conductors, substantially as set forth.

4. The combination, with one or more over-
5 head circuit-conductors having no ground-con-
nections, of one or more independent light-
ning-conductors situated in proximity thereto
and wires extending at intervals from said
lightning-conductors to the earth, substan-
10 tially as set forth.

5. The combination, with one or more over-

head circuit-conductors having no ground-con-
nections, of one or more independent grounded
lightning-conductors provided with numerous
projecting points situated in proximity to said 15
circuit-conductors, substantially as set forth.

This specification signed and witnessed this
29th day of May, 1886.

JONATHAN H. VAIL.

Witnesses:

I. O. ELLINGER,
WM. PELZER.