(No Model.)

J. F. MARTIN.

ELECTRIC WIRE INSULATOR.

No. 287,146. Patented Oct. 23, 1883.

Fig. 1.

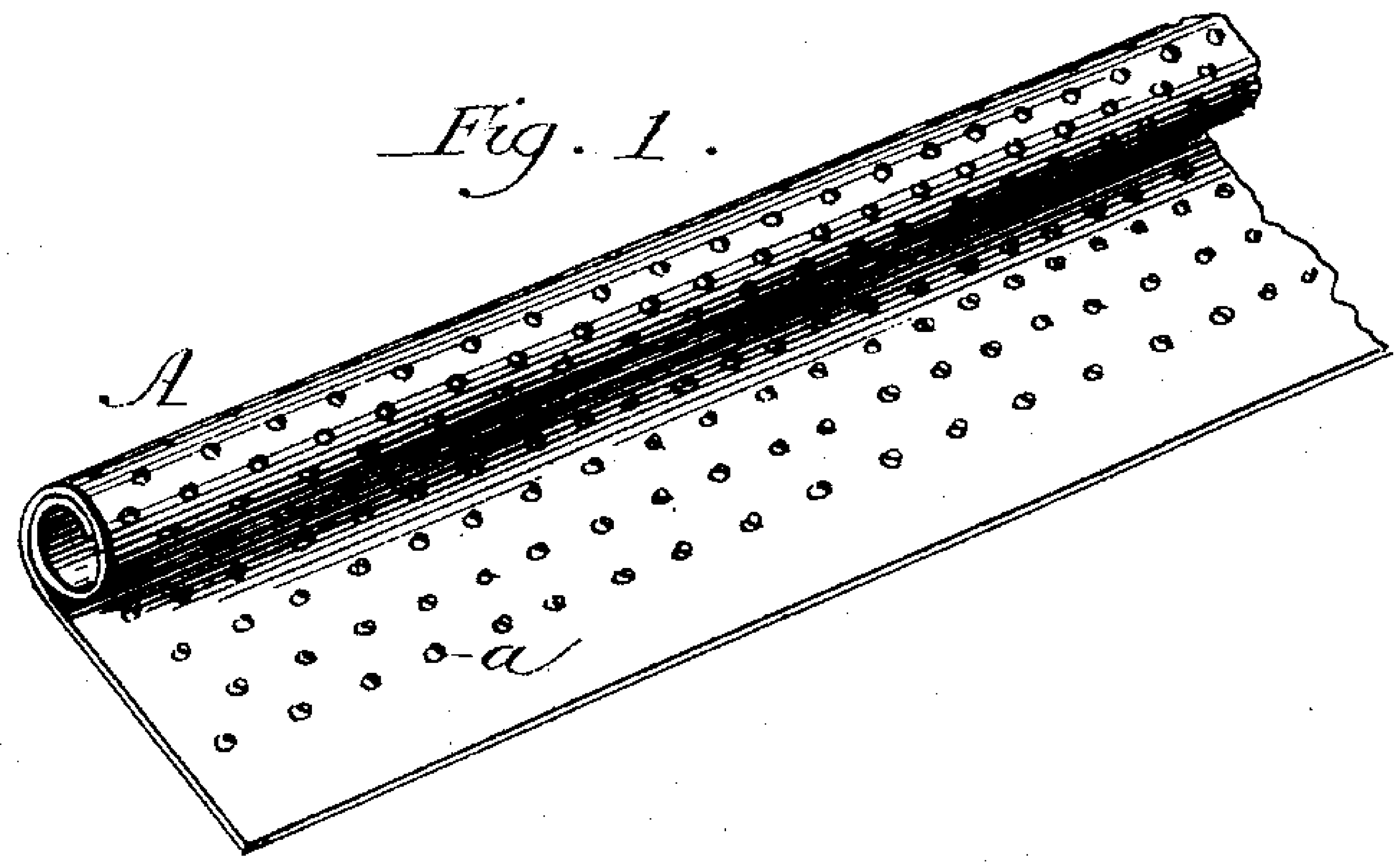


Fig. 3.

Fig. 2.

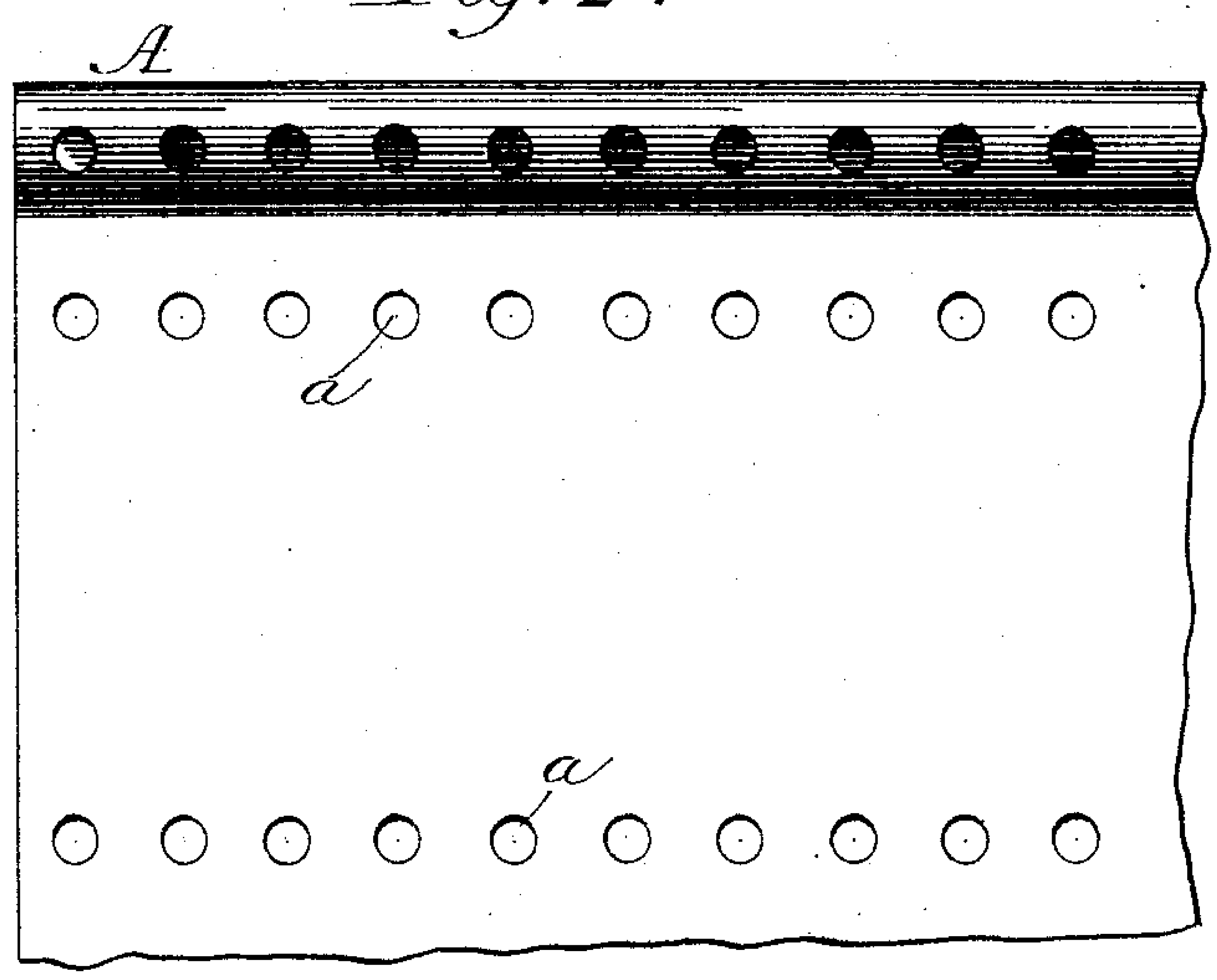
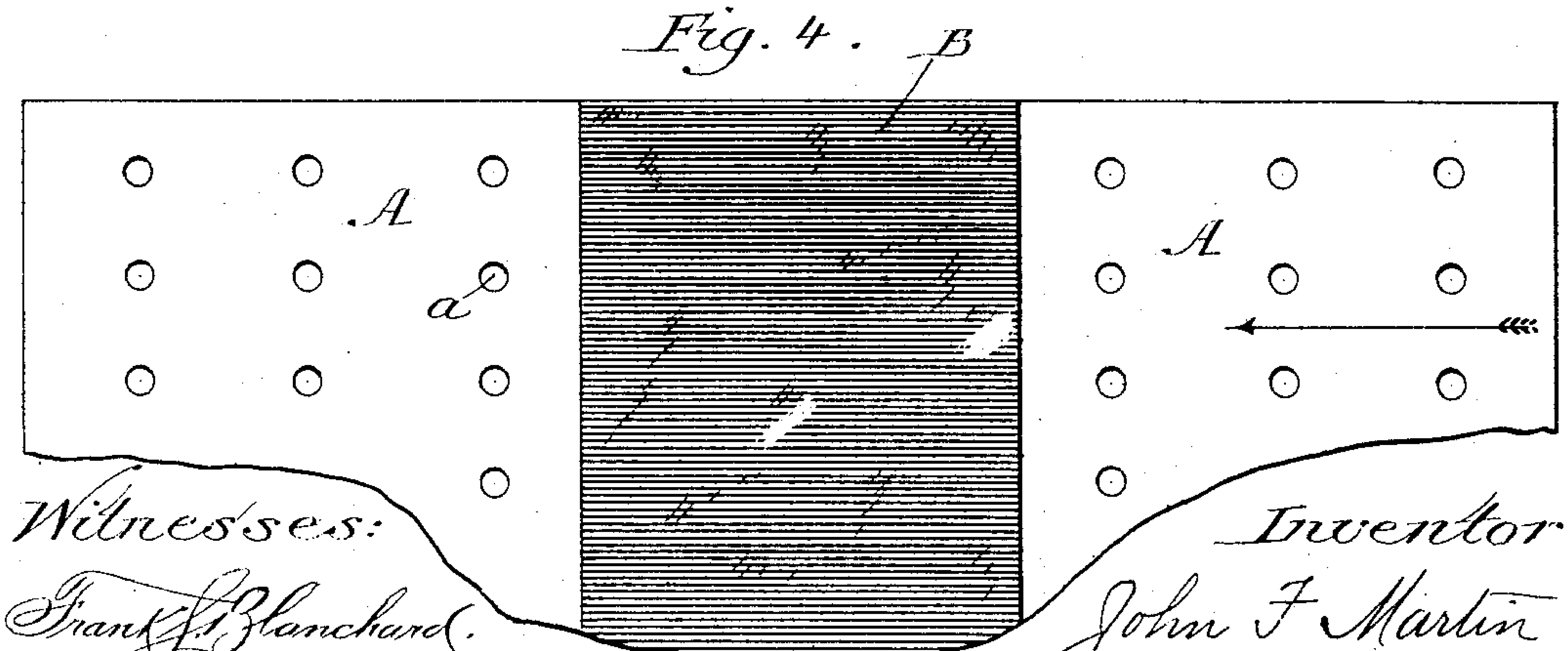


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN F. MARTIN, OF CHICAGO, ILLINOIS.

ELECTRIC-WIRE INSULATOR.

SPECIFICATION forming part of Letters Patent No. 287,146, dated October 22, 1883.

Application filed January 27, 1883. Renewed September 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. MARTIN, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Electric-Wire Insulators, of which the following is a specification.

My invention relates to improvements in wire-insulators having a tubular form, and adapted to insulate wires arranged in underground conduits, houses, &c., but more particularly designed to perfect an underground electric-wire system for cities and towns, forming the subject-matter of another application.

The objects of my invention are to provide means for riveting individual wire-insulators of tubular form, and composed of sheet-paper or woven fabric, by means of a compound which, while performing the functions of a rivet, will have an auxiliary effect in insulating an electric wire confined by the insulator; to provide means for riveting a tubular insulator of the character and in the manner described, and at the same time incorporate therewith a layer of rubber fabric or compound or other insulating material, which in the completed tube shall lie intermediate and be confined and protected between the inner and outer walls of the insulator. I attain these objects by devices illustrated in the accompanying drawings, in which—

Figure 1 is a perspective, in a partially-finished state, of an insulator embodying my invention; Fig. 2, a plan view of the same, with the perforations, on an enlarged scale; Fig. 3, a cross-section of Fig. 2; and Fig. 4, a plan view of a blank for insulators embodying my invention, and when provided with an intermediate layer of rubber or other non-conducting fabric or compound.

Similar letters of reference indicate the same parts in the several figures of the drawings.

A represents an insulator for individual electric wires, and composed of sheet-paper or woven fabric wound in concentric layers about itself in tubular form, the inner diameter of the insulator being sufficient to permit the ready insertion of the wire at any time after the insulator is completed. As shown in Fig. 1, the paper is perforated before rolling, as shown at *a*, said perforations being arranged without any design as regards their order, but preferably should be substantially evenly distributed over the sheet. After perforating, and before rolling the sheet into the form of an insulator, the sheet is coated, so as to fill the perforations with a non-conducting and adhesive compound, which may be of pitch, rosin, or of any substance or substances having the above-named characteristics, said compound being applied in the heated state and the insulator formed before the compound cools. By this process the compound is firmly compressed in the perforations, and when cooled causes perfect adhesion of the layers of paper or fabric, and as a result the walls of the insulator are solidified, and, as it were, riveted together, while at the same time a substantial part of the insulator is composed of a compound evenly distributed without materially increasing the thickness of its walls.

In Figs. 2 and 3 the perforations are shown arranged in regular series, and in such a manner that they are coincident with each other, and extend entirely through the walls of the insulator when in its completed form, which perforations may be made before or after the insulator is formed. These coincident perforations are filled with the non-conductive and adhesive compound by dipping the insulator one or more times in or until the compound has fully and solidly filled them. Another method is to dip the insulator while on the mandrel in the compound and hold it there until the perforations are filled, the mandrel operating as a bottom to the perforations and retaining the compound until it has solidified in the perforations, and at the same time preventing the compound from smearing and rendering irregular the inner walls of the insulator. The same result may be obtained by omitting to perforate the first and inner layer or coil of the paper or fabric.

Perforations coincident with each other—that is, a perforation extending continuously through or nearly through the walls of the insulator—provide for solid masses of a non-conducting compound riveting the several coils together, and not only render the insulator much more substantial and rigid, but a more effective insulator.

Among the advantages arising through forming an insulator of paper or woven fabric coiled about itself is that of providing a ready means

for inserting and effectively protecting a sheet-rubber fabric or compound, forming a tubular insulator intermediate the inner and outer walls of the insulator. This may be readily understood by referring to Fig. 4, in which B represents a sheet of rubber laid lengthwise upon the blank of paper or fabric about to be rolled in tubular form for an insulator. This rubber sheet should be of sufficient width so that when the blank is rolled in the direction indicated by the arrow to completely encircle and form a tube surrounding so much of the paper or fabric as is between the rubber and the axis of the insulator. The position of the rubber relative to the inner and outer walls of the insulator is determined by its relative position to the ends of the blank; but in any case the rubber should be placed so as to be protected upon both its inner and outer faces by the paper or fabric.

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

1. An electric-wire insulator the walls of which are provided with a series of perforations filled with a non-conducting compound, substantially as described.

2. An electric-wire insulator composed of sheet-paper or woven fabric wound in concentric layers about itself in tubular form, and having incorporated therewith the rubber sheet or compound, substantially as described.

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