

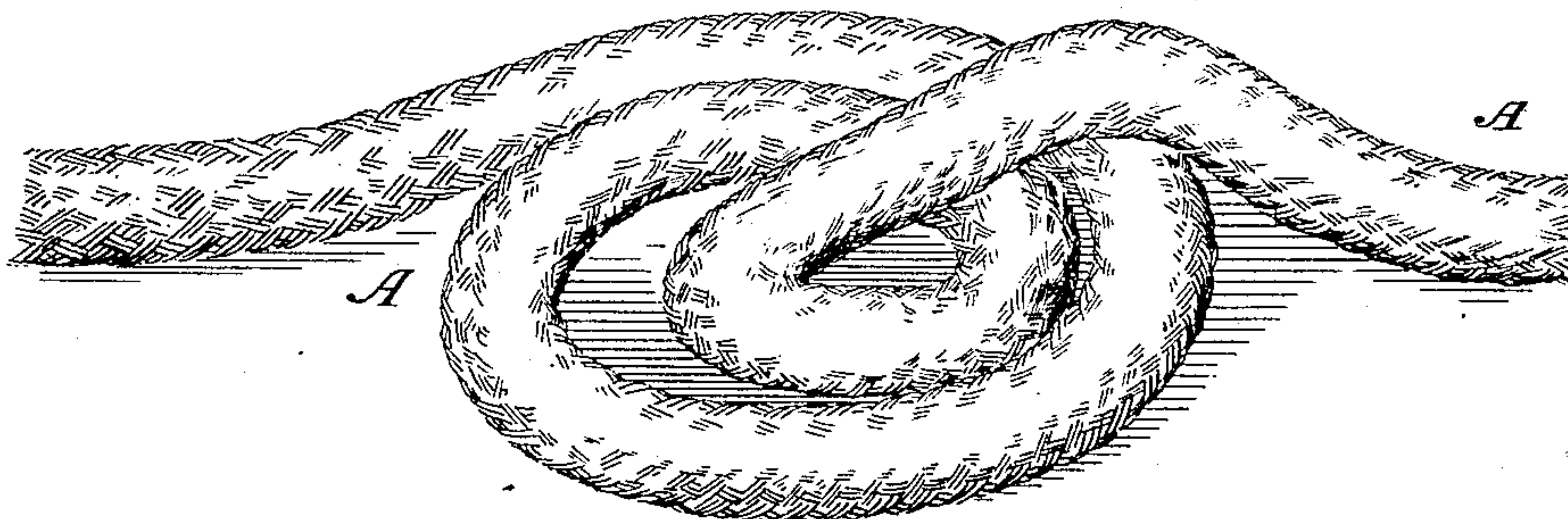
(No Model.)

G. R. KRESS.  
HOLLOW BRAIDED LIGHTNING ROD.

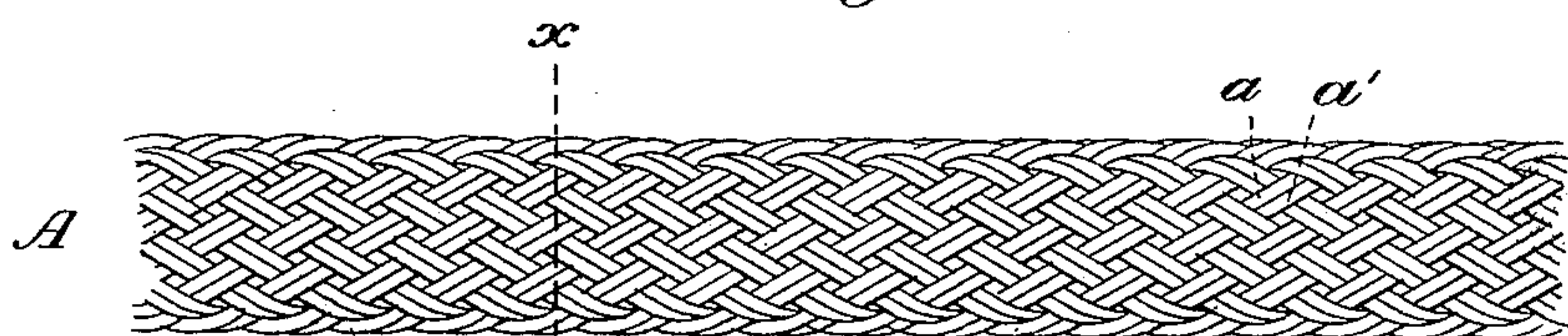
No. 452,796.

Patented May 26, 1891.

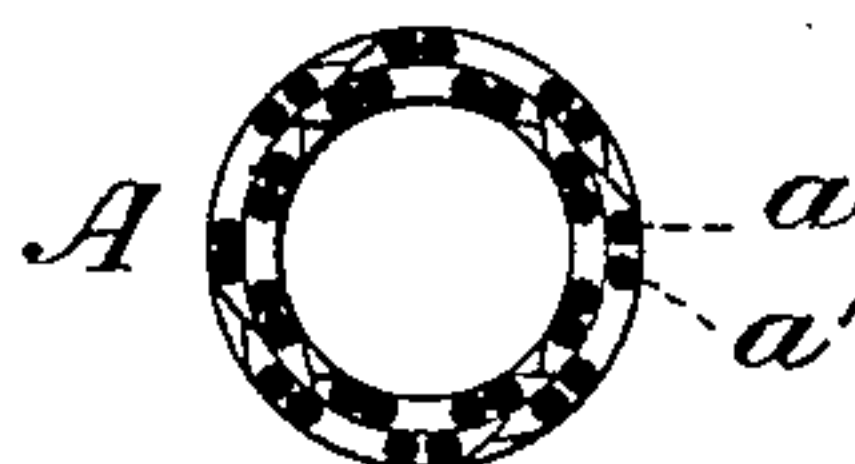
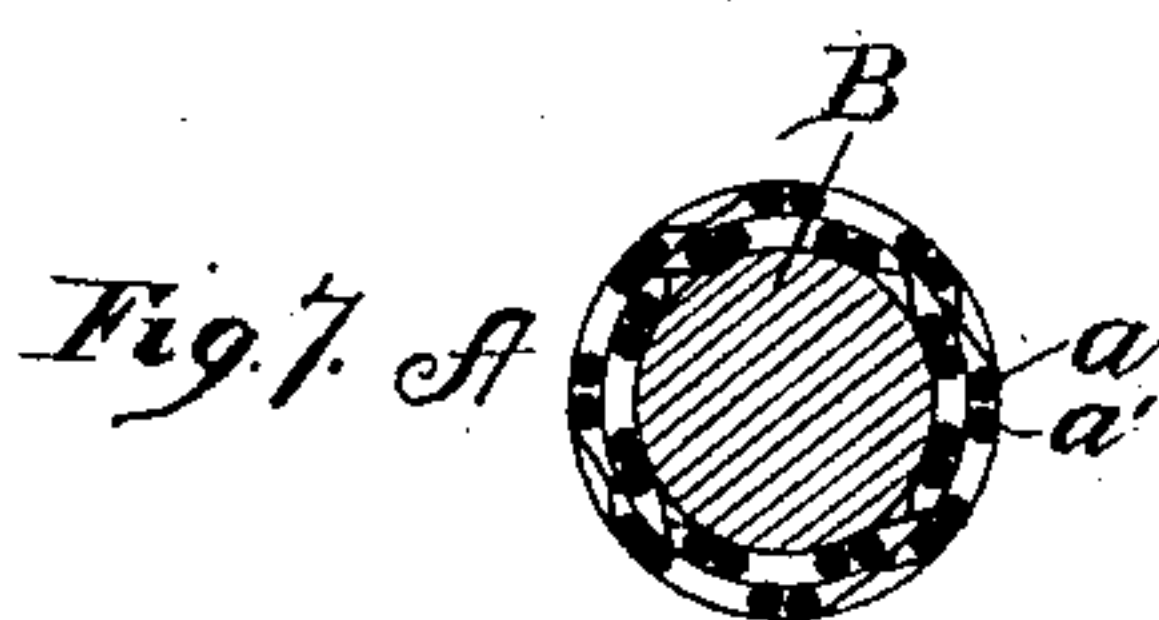
*Fig. 1.*



*Fig. 2.*



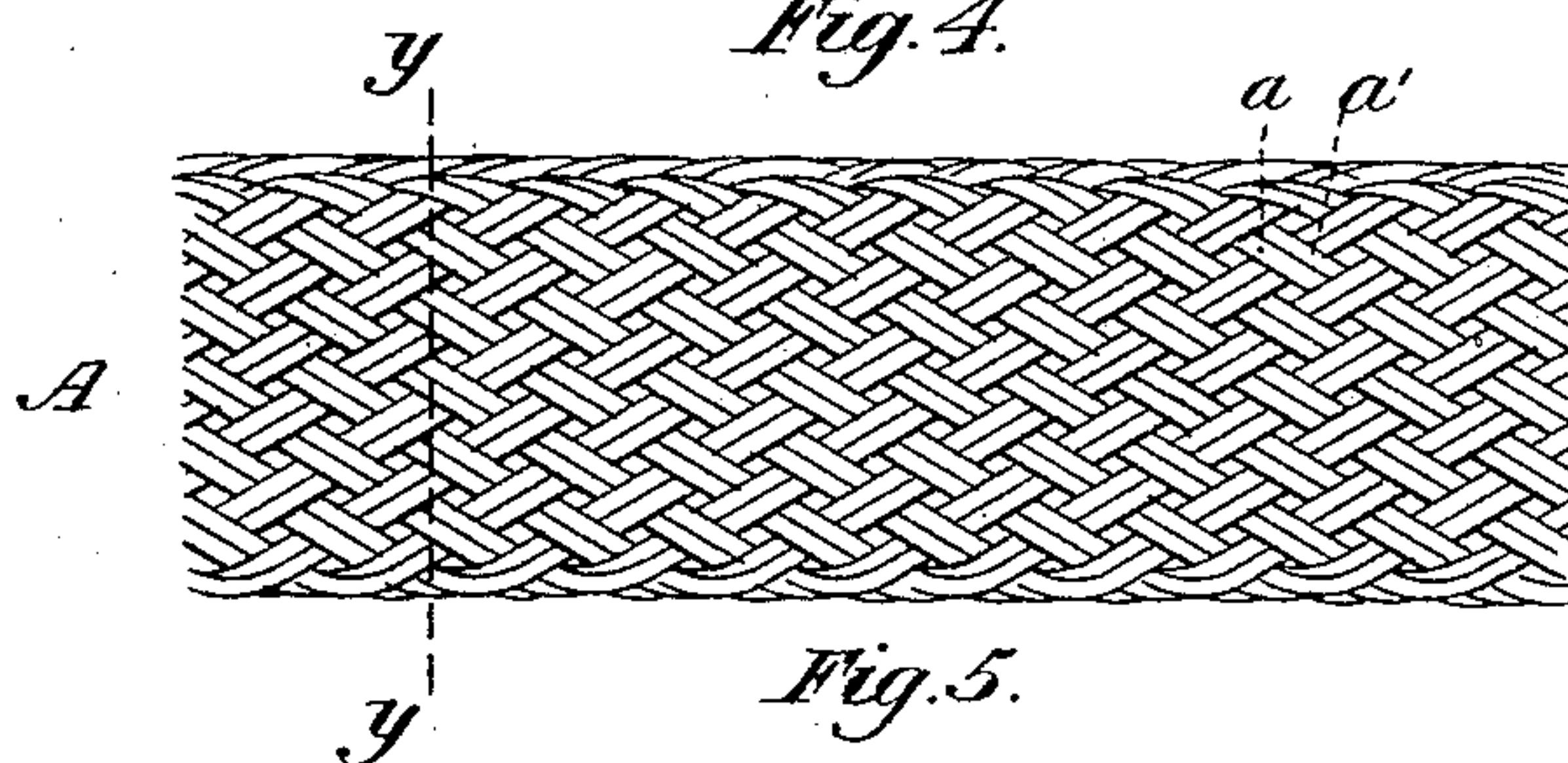
*Fig. 3.*



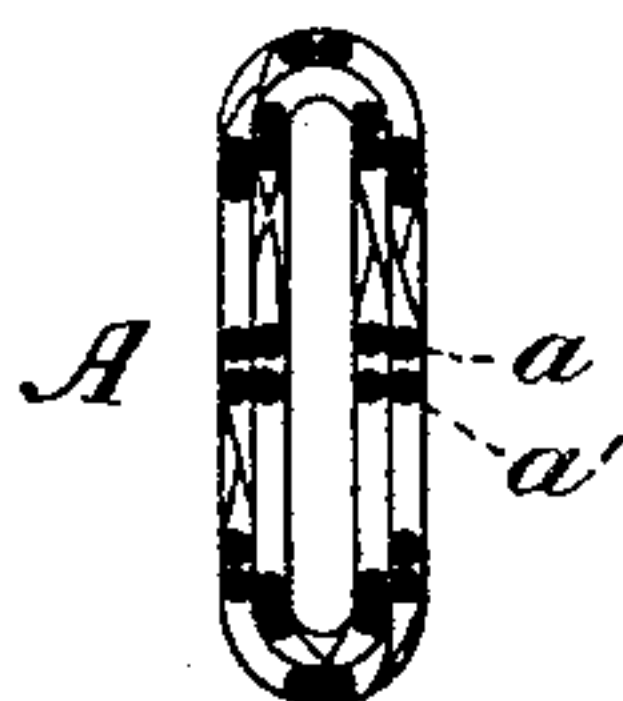
*Fig. 6.*



*Fig. 4.*



*Fig. 5.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

GEORGE R. KRESS, OF PITTSBURG, PENNSYLVANIA.

## HOLLOW BRAIDED LIGHTNING-ROD.

SPECIFICATION forming part of Letters Patent No. 452,796, dated May 26, 1891.

Application filed November 8, 1890. Serial No. 370,784. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE R. KRESS, of Pittsburgh, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Hollow Braided Wire Cables; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a coil of lightning rod or conductor made according to my improvement, showing the flexibility of it and that it is continuous. Fig. 2 is a side elevation of a section of the same. Fig. 3 is a cross-section of the rod as shown at Fig. 2, taken in the line  $xx$ . Fig. 4 is an elevation of a modified form of construction of my improved conductor, showing the same as flattened, by which it assumes a "tape" shape. Fig. 5 is a cross-section of the form shown in Fig. 4, taken on the line  $yy$ . Fig. 6 is a detail view of the solid rod or stiffener; and Fig. 7 is a cross-section through the round form, showing the solid stiffener in position.

My improvement has reference to that class of lightning rods or conductors which are known as "continuous" rods or conductors. They are distinguished in this respect from the old style of lightning-rods, which were made in sections screwed or fastened together at the ends thereof.

My present invention is a new article of manufacture, consisting of a lightning rod or conductor formed as a hollow braided continuous conductor, which may be, when finished, either tubular or it may be made and left rectangular, or given a flat or tape shape, just as best suits the convenience or judgment of the manufacturer; but when made flat it should not be so compressed as to make it virtually solid.

Referring to the drawings, A indicates a conductor in the various figures, and  $a$  and  $a'$  indicate the respective wires of which the strands in the plaited conductor are composed. In the drawings I have shown what may be termed a "two-wire plait," although the conductor may be made of strands in which a greater or less number of wires is used.

Heretofore continuous conductors have,

as a rule, been made solid and generally of copper wire. The objection to a conductor of this form is, as we have found it in practice, that as a rule the conductor is not stiff enough to retain its shape as it should, and particularly have we found it to be too flexible to make what we call a good "stiff top section"—that is, a section which is at the top of the rod and which extends above the roof and which is the top section of the whole. This piece must be sufficiently rigid to stand alone, at least, for that portion of it which stands above the roof or the support to which it is fastened.

It is very important that a conductor should be made in one continuous piece, thus avoiding breaks, and yet at the same time it must not be too soft, and in the effort to meet the demand for a continuous cable which would be sufficiently flexible to handle conveniently, and yet which could be made stiff enough to stand alone when needed, I have produced the conductor herein described.

My conductor is plaited on a machine designed for the purpose, and having some peculiar features of construction for which I may hereafter apply for Letters Patent. The plaiting is done around an upright core, and as fast as the braiding is completed the conductor is drawn upward from off the core and wound around a drum, and is thus taken out of the way of the machine.

The conductor may be made in lengths of any desired proportion up to one thousand feet. I prefer to make the conductor of about one-half inch diameter, inside measurement, and to use a wire of not less than No. 16 or No. 18 gage. The conductor may be made of any desired size by reducing the gage of the wire and the size of the core, and the plaiting of the wire may be made tight or loose, as desired; but I prefer a medium course in this respect. In this form of construction I consider that I secure a more effective conductor for the same weight of metal than the ordinary solid twisted wire conductors, owing to the fact that I secure more surface in the hollow form than in the solid—that is to say, I have the outside surface of the conductor and the inner surface of the hollow conductor, and owing to the fact that the conductor is composed of plaited strands in which the wires



are more or less distinctly separated, I secure, to some extent at least, a conducting-surface on each and every wire or strand of which the conductor is composed. I do not deem any particular form or shape necessary so long as the essential feature of the hollow conductor is retained. Many seem to prefer the tape shape, and to produce this it is only necessary after the conductor has been plaited around the core and as it leaves the core to run it through a die, which flattens and changes it from the tubular form to the flattened or tape-like form indicated in Fig. 4.

As is well known to those familiar with the business, lightning-rods are put up from the top down—that is, the top piece is arranged first—and from that the conductor is finished downward to the ground.

In order to make the upper end of the rod, or that portion which extends above the roof, sufficiently rigid to stand alone, I employ in connection therewith an iron or copper solid rod B, Fig. 6, which may be run in at the top and to which may be attached any desired ornamental work or other finishing work connected with the continuous top section.

In Figs. 6 and 7 I have illustrated the round form of stiffener; but of course it is to be understood that when the flat conductor illustrated in Fig. 5 is employed the shape of the stiffener is changed correspondingly.

No particular form of plaiting is essential, although I prefer the form shown in the drawings, which is what is called the "basket-plait" and which is done by using two wires together, although any other form of plaiting will answer the same purpose.

Having thus described my invention, what I claim herein, and desire to secure by Letters Patent of the United States, is—

The combination, in a lightning rod or conductor, with a hollow plaited continuous cable, of a stiffener consisting of a solid rod inserted therein and connected therewith at its upper end, thereby forming a stiff top section, substantially as set forth.

In testimony whereof I have hereunto set my hand.

GEORGE R. KRESS.

Witnesses:

W. B. CARSON,  
T. K. McCANCE.