

(No Model.)

E. T. GREENFIELD.

ART OF MAKING PAPER OR ANALOGOUS TUBING.

No. 477,593.

Patented June 21, 1892.

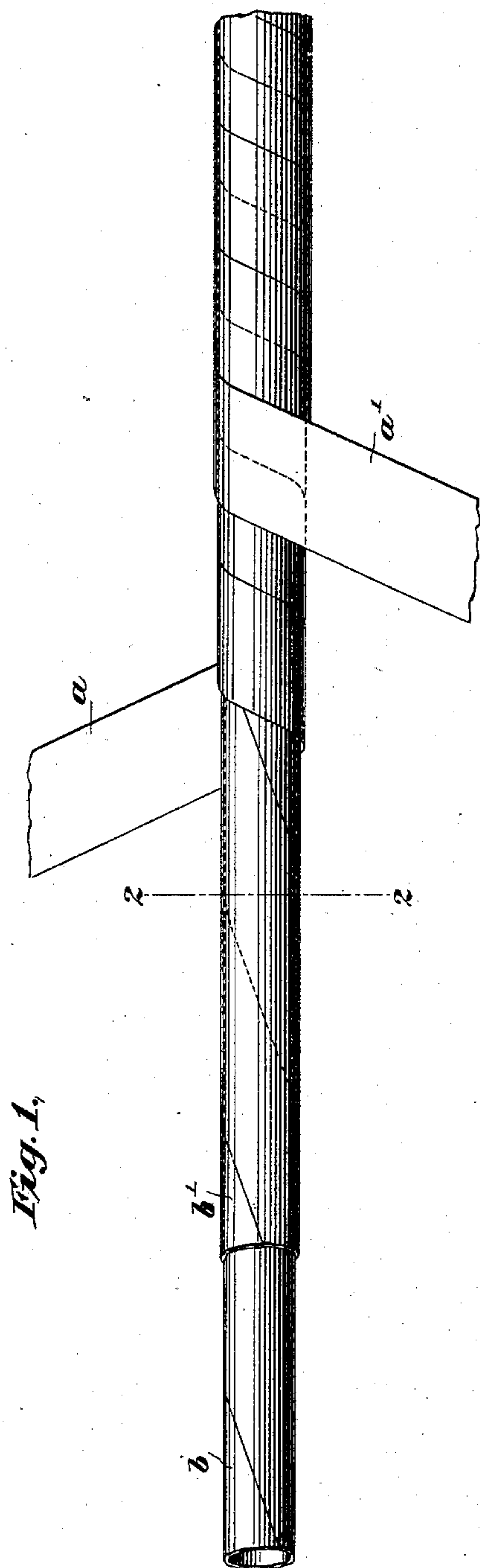


Fig. 1.

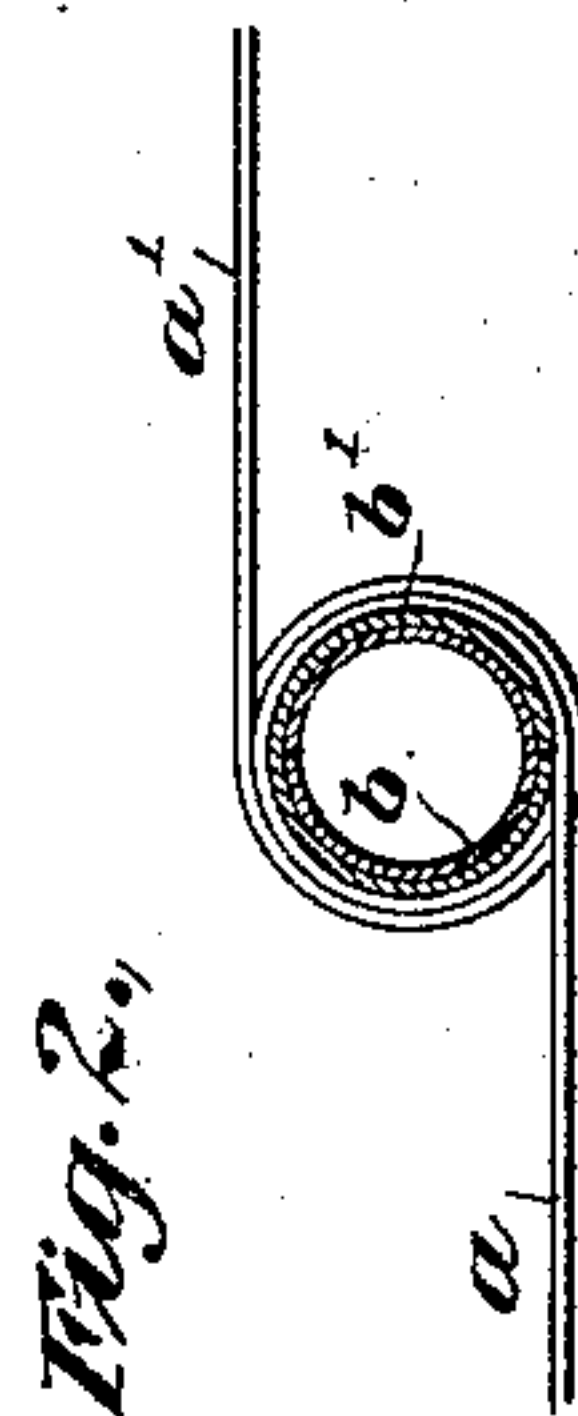


Fig. 2.

Witnesses
A. V. Hiney.
Edward Thorpe.

Inventor
Edwin J. Greenfield
By his Attorney
Charles J. Kintner

UNITED STATES PATENT OFFICE.

EDWIN T. GREENFIELD, OF NEW YORK, N. Y.

ART OF MAKING PAPER OR ANALOGOUS TUBING.

SPECIFICATION forming part of Letters Patent No. 477,593, dated June 21, 1892.

Application filed January 21, 1891. Serial No. 378,516. (No model.)

To all whom it may concern:

Be it known that I, EDWIN T. GREENFIELD, a citizen of the United States, residing at New York, county of New York, and State of New York, have made a new and useful Invention in the Art of Making Paper or Analogous Tubing.

My invention is directed particularly to improvements in tubes or pipes made of strips of paper; and it has for its objects, first, the construction of a tube of this character of great strength; second, the construction of a tube which shall be substantially water and air tight; third, the construction of a tube which shall be especially adapted for use in connection with the laying of electrical conductors. I accomplish these objects with the tube hereinafter described, but particularly pointed out in the claims which follow this specification.

My invention will be fully understood by referring to the accompanying drawings, in which—

Figure 1 represents a side elevational view of my improved form of tube, showing the conformation of the several layers of paper of which the tube is constructed. Fig. 2 is a cross-sectional view of Fig. 1, taken on line 2-2.

I form a cylindrical-shaped core of two strips of paper *b b'* by drawing them longitudinally over a forming-mandrel and giving to them a twisted motion as they are thus drawn forward, the strips being so placed as they enter a guiding-shoe prior to passing over the mandrel that they break joints with each other. I am thus enabled to form a core in which the strips are bound together by the tensile strength which is put upon them as they are drawn and as the completed core is twisted in its forward movement. For a fuller understanding of the method of making such a core or tube reference is had to a prior patent granted to me on October 20, 1891, and numbered 461,676, wherein is described and claimed an apparatus for making paper tubes by feeding two strips of paper *b b'* from formers through a throat, so as to cause said strips as they are drawn forward into the cylindrical throat to break joints and assume a twisted or spiral conformation. This core may also be made by hand or in any other

preferred manner and of more than two strips of paper. As the core is fed forward or rotated I wind about it one or more strips of paper *a a'* in such manner that they break joints with each other. In this manner I devise a tube having a central core of spiral form, the spiral convolutions of paper giving increased strength to the tube, as well as increased security against the percolation of moisture. After the core is thus constructed it may be cured with insulating material after any of the preferred methods now known and in general use.

I am aware that a paper tube has heretofore been constructed having a core formed of a strip of paper wound spirally with great pitch and having one or more layers of paper wound thereon in spiral form, but with less pitch than with the core, as shown and described in patent to Denny, No. 444,233, granted January 6, 1891, and I make no claim broad enough to include such construction, my application being directed specifically to a paper tube having a cylindrical core of two pieces of paper drawn diagonally over a former, so as to cause them to bind the one upon the other and to assume a spiral or twisted shape and in such manner as to break joints throughout their length, and also to the novel method, hereinbefore described, of making or constructing such a tube.

Instead of making the above-described tube of strips of paper, I may make it of strips of any fibrous material which will assume the spiral conformations shown and described.

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

1. The improved method of making a core or tube from two or more strips of paper, consisting in feeding the overlapped strips constantly forward while bending and holding them in tubular form and simultaneously twisting and drawing the same in one direction longitudinally, whereby they are caused to take a spiral tubular form with overlapped and closely-compressed joints, substantially as specified.

2. The improved method of making tubes from paper strips, consisting in feeding two or more overlapped strips constantly forward

while bending and holding them in tubular form, simultaneously twisting and drawing the same in one direction and longitudinally, whereby the resultant core is caused to take
5 the spiral tubular form with overlapped and closely-compressed joints, and then winding one or more exterior layers of like material on the outside of the said core, substantially as specified.

10 3. A tube with a longitudinal core made of two pieces of paper having a twisted or spiral conformation, said pieces being wound in the same direction and being formed so as to break joints throughout their length, in com-
15 bination with one or more exterior layers of

paper wound thereon, substantially as described.

4. A tube having a core constructed of two strips of paper drawn longitudinally and twisted together, said strips being wound in 20 the same direction, breaking joints with each other throughout their length, in combination with two or more spirally-wound exterior strips of similar material, each of said exterior strips breaking joints with the other, 25 substantially as described.

EDWIN T. GREENFIELD.

Witnesses:

A. V. HINEY,

F. W. MASON.