

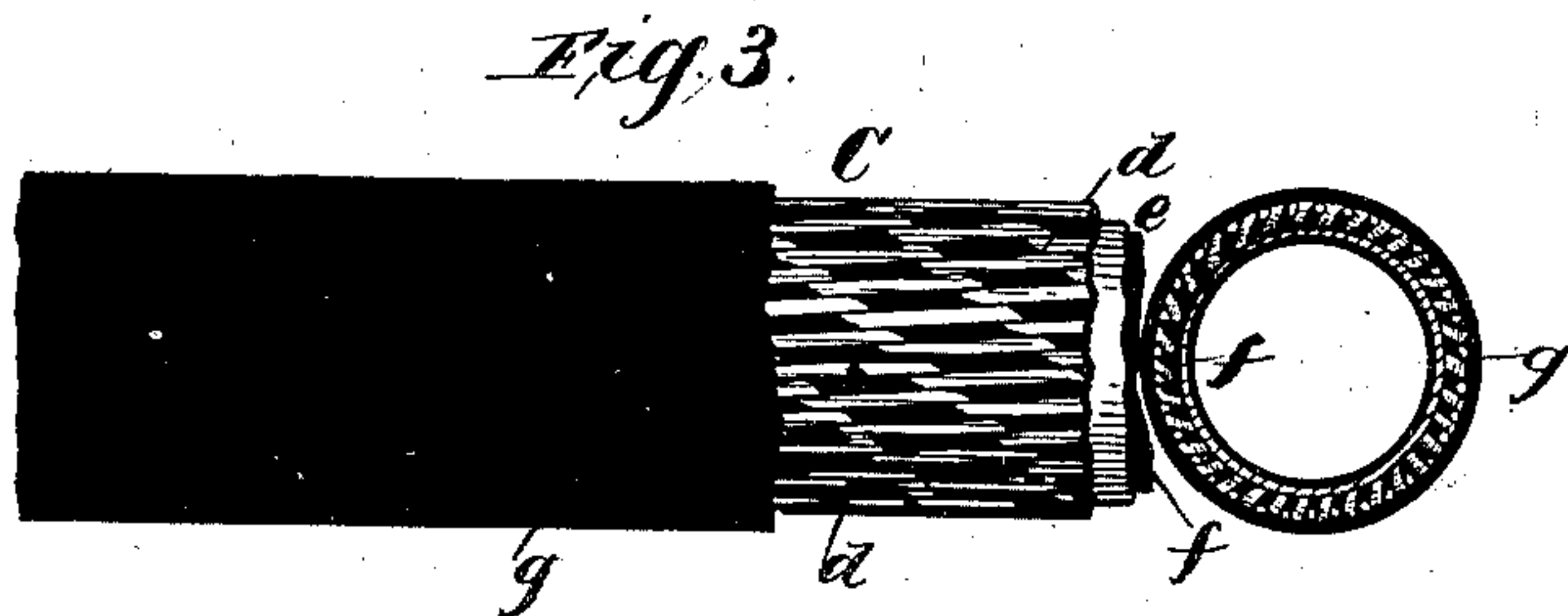
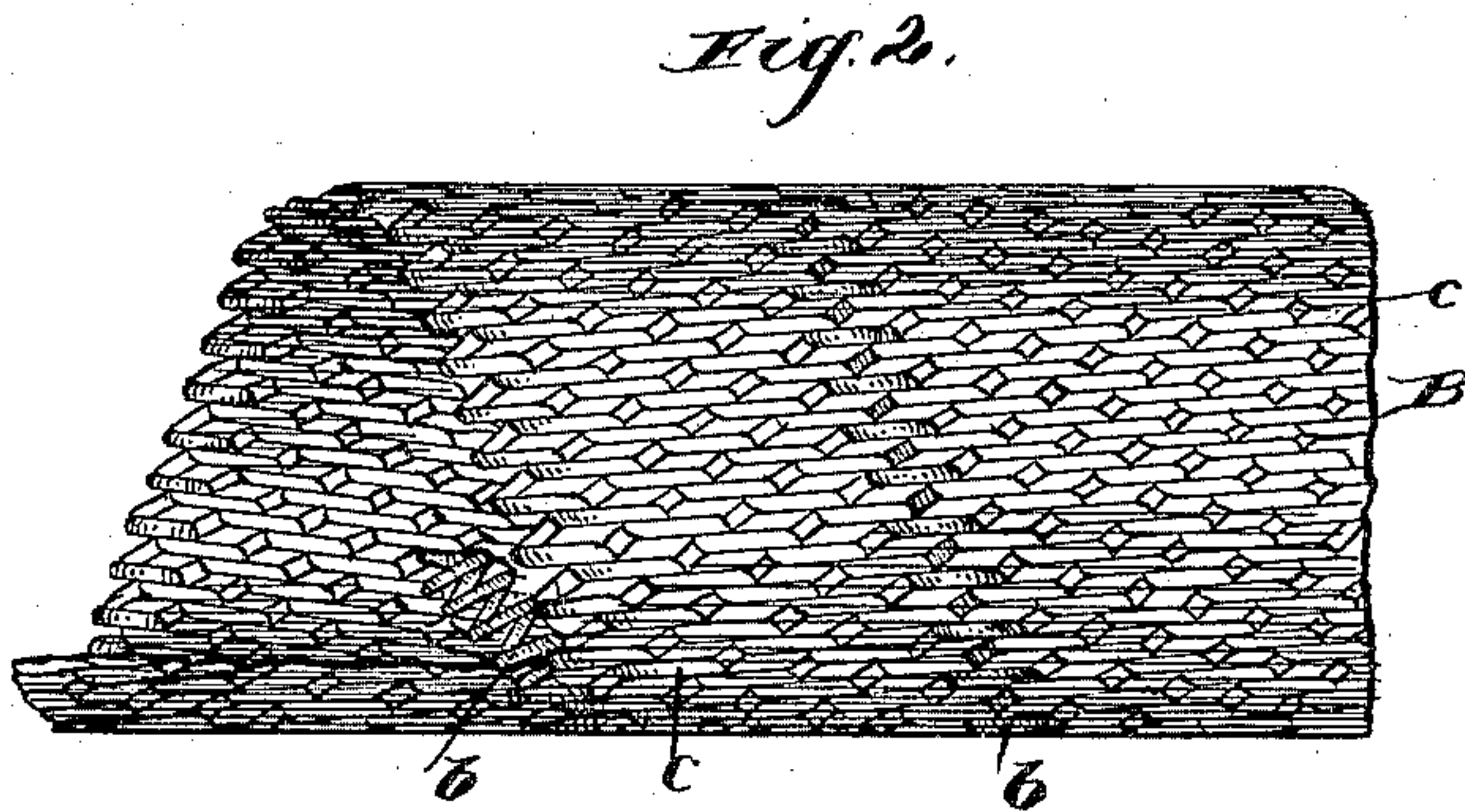
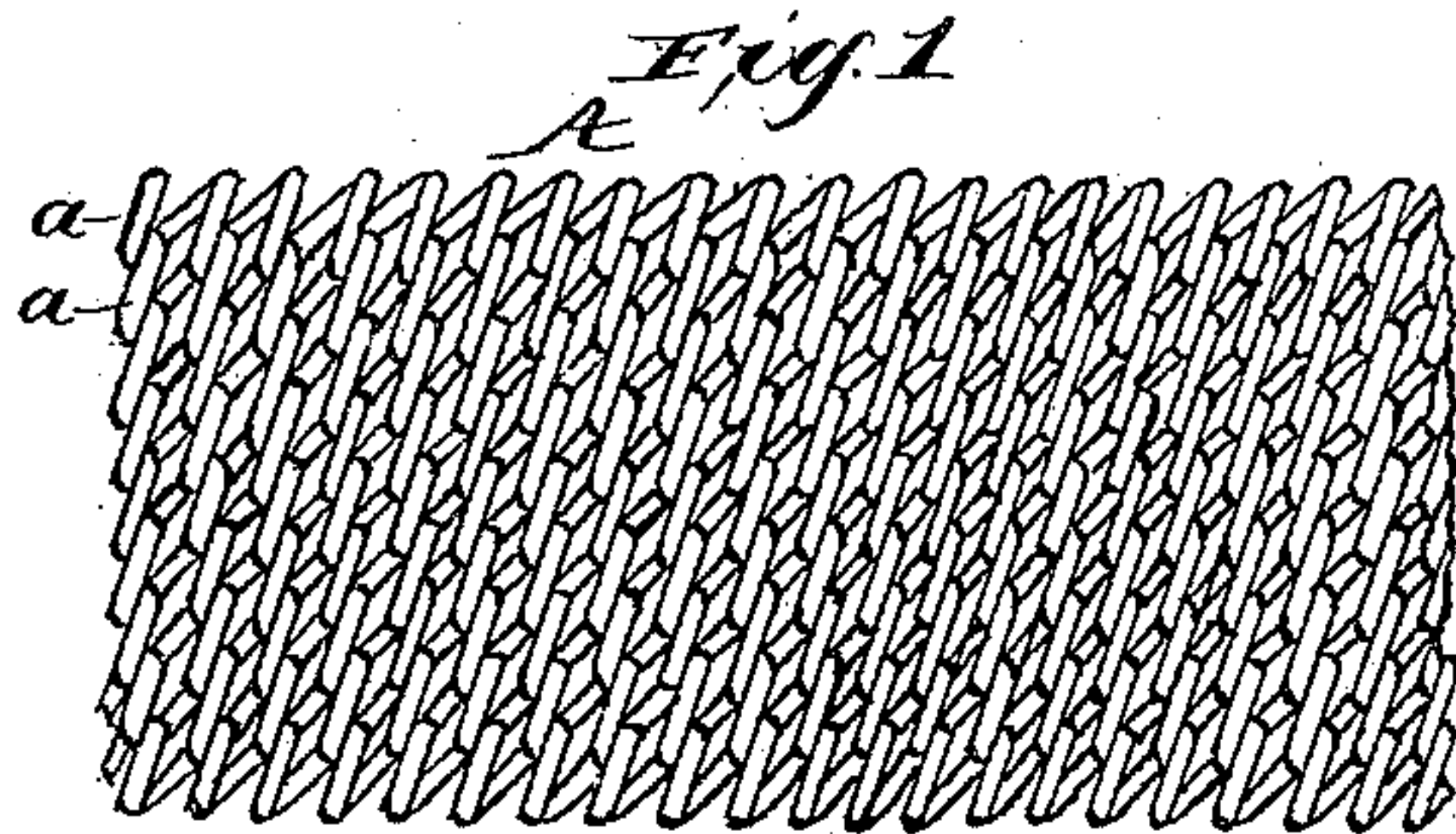
(No Model.)

T. MIDGLEY.

HOSE OR TUBING.

No. 398,430.

Patented Feb. 26, 1889.



Witnesses
Wm. J. Scott
Samuel Ker, Jr.

Inventor
T. Midgley
By Johnston, Reinick & Dyer
Attorneys

UNITED STATES PATENT OFFICE.

THOMAS MIDGLEY, OF BEAVER FALLS, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JAMES E. EMERSON, OF SAME PLACE.

HOSE OR TUBING.

SPECIFICATION forming part of Letters Patent No. 398,430, dated February 26, 1889.

Application filed October 20, 1888. Serial No. 288,629. (No model.)

To all whom it may concern:

Be it known that I, THOMAS MIDGLEY, a citizen of the United States, residing at Beaver Falls, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Hose or Tubing; and I do hereby 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.

My invention relates to hose or tubing, and has special reference to an improvement on that shown and described in my applications for patents, Serial Nos. 279,932 and 280,288, in which special means are shown for strengthening or re-enforcing the hose longitudinally and transversely.

The present construction dispenses with the longitudinal re-enforcement in the one and one of the tubes in the other construction referred to, and provides adequate resistance to the strain or pressure brought to bear upon the hose, while it is rendered much lighter and more flexible.

The invention will be hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a plan view of a section of a sheet of wire. Fig. 2 is a side elevation of a tube formed from a sheet of wire, and Fig. 3 is a similar and an end view of a section of hose partly covered with rubber.

Reference being had to the drawings and the letters marked thereon, A indicates a sheet of wire made from sections *a* of coiled wire, which are intertwined by screwing one into another until a sheet of any desired length and width has been formed. After the sheet has been thus formed it is wound spirally around a mandrel and the adjacent edges secured together by screwing a separate section, *b*, of coiled wire into the helices on the edges of the sheet and a tube, B, formed, in which the helices *c* run diagonally around the tube. The tube B is

then passed through a furnace and heated to about a cherry-red heat and the helices *c* stretched and flattened into links *d*, which are seated in each other by subjecting the tube to longitudinal tension while passing through the furnace. In stretching the tube B its length is increased about two and a half times and its diameter reduced about the same proportion, as shown by the tube C in Fig. 3.

The tube B may be stretched by any suitable means—such as grasping the front end of the tube as it comes out of the furnace with a clamp or a pair of suitably-constructed tongs and attaching them to a tension device, by which sufficient force can be exerted upon the tube to stretch all the helices to their full extent. In stretching the helices of the tube B they retain their diagonal course around the tube, and the tube C is consequently composed of links which run at an angle to the length and cross-section of the tube, thus providing the greatest degree of resistance possible to be obtained against longitudinal and lateral strains brought to bear upon the hose by high pressure of fluids. The tube C is then tempered and afterward lined with canvas, *e*, and rubber, *f*, and covered with rubber, *g*, or its equivalent, and the whole subjected to heat to vulcanize the rubber, or it may be lined only for some classes of hose.

Hose thus constructed is of the same weight as that ordinarily made from rubber and canvas, and will collapse when being wound upon a reel, while it is capable of resisting the weight of ordinary road-vehicles when filled without detriment to the hose.

The hose may be made of any desired diameter, and in lengths to suit any use to which it may be desired to use it.

The tube C is claimed in my application Serial No. 288,627.

Having thus fully described my invention, what I claim is—

1. Hose or tubing composed of a body consisting of intertwined helices stretched to their full extent and running diagonally

around the tube, and a lining of fluid-repellent material, substantially as described.

2. Hose or tubing composed of a body consisting of intertwined elongated helices running at an angle to the length, and also at an angle to a cross-section of the tube, a lining, and a covering of fluid-repellent material, substantially as described.

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

THOMAS MIDGLEY.

Witnesses:

J. F. MERRIMAN,
JOHN REEVES.