

(No Model.)

L. NICOLAI.
CARD BOARD TUBE.

No. 467,258.

Patented Jan. 19, 1892.

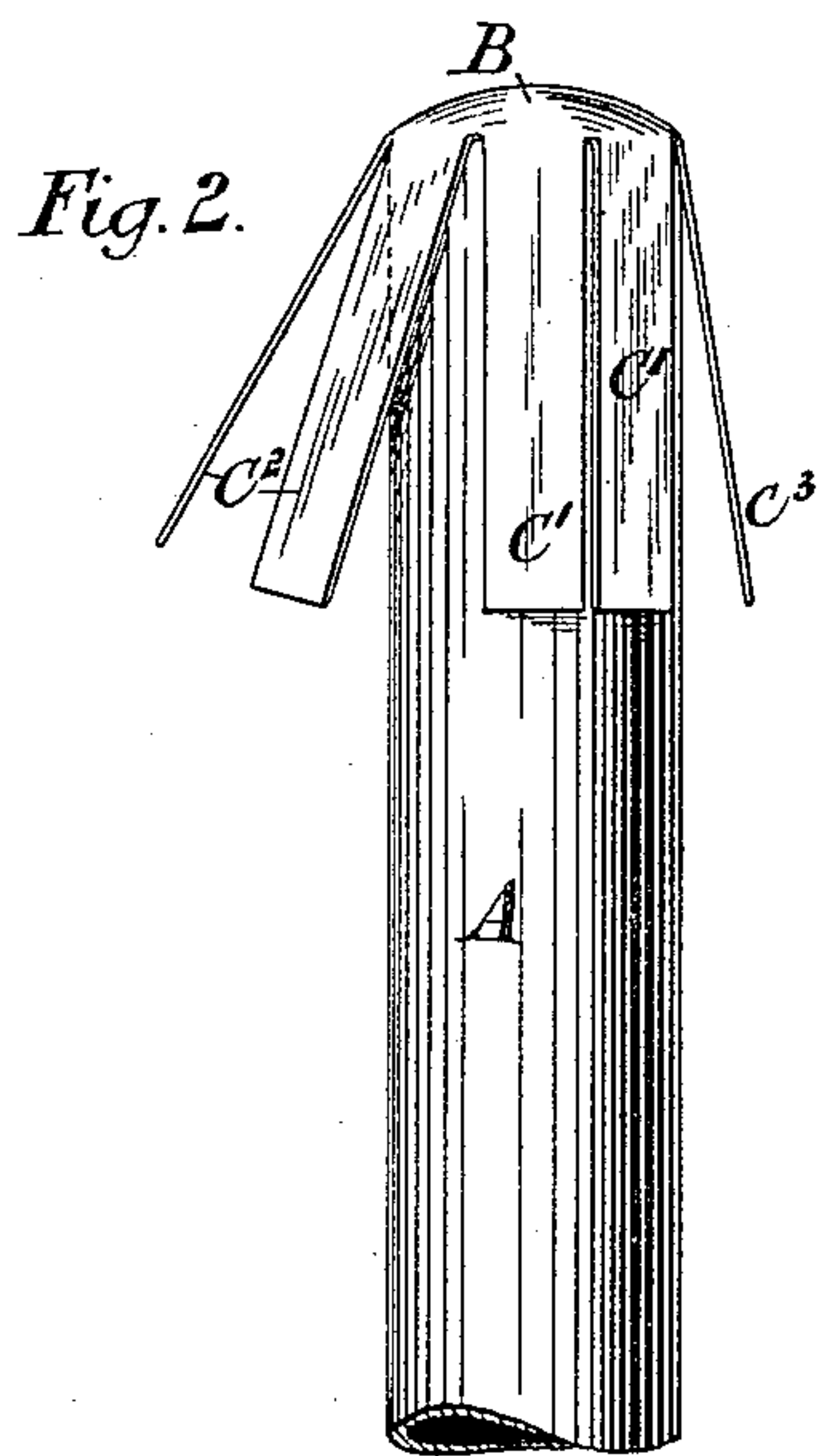
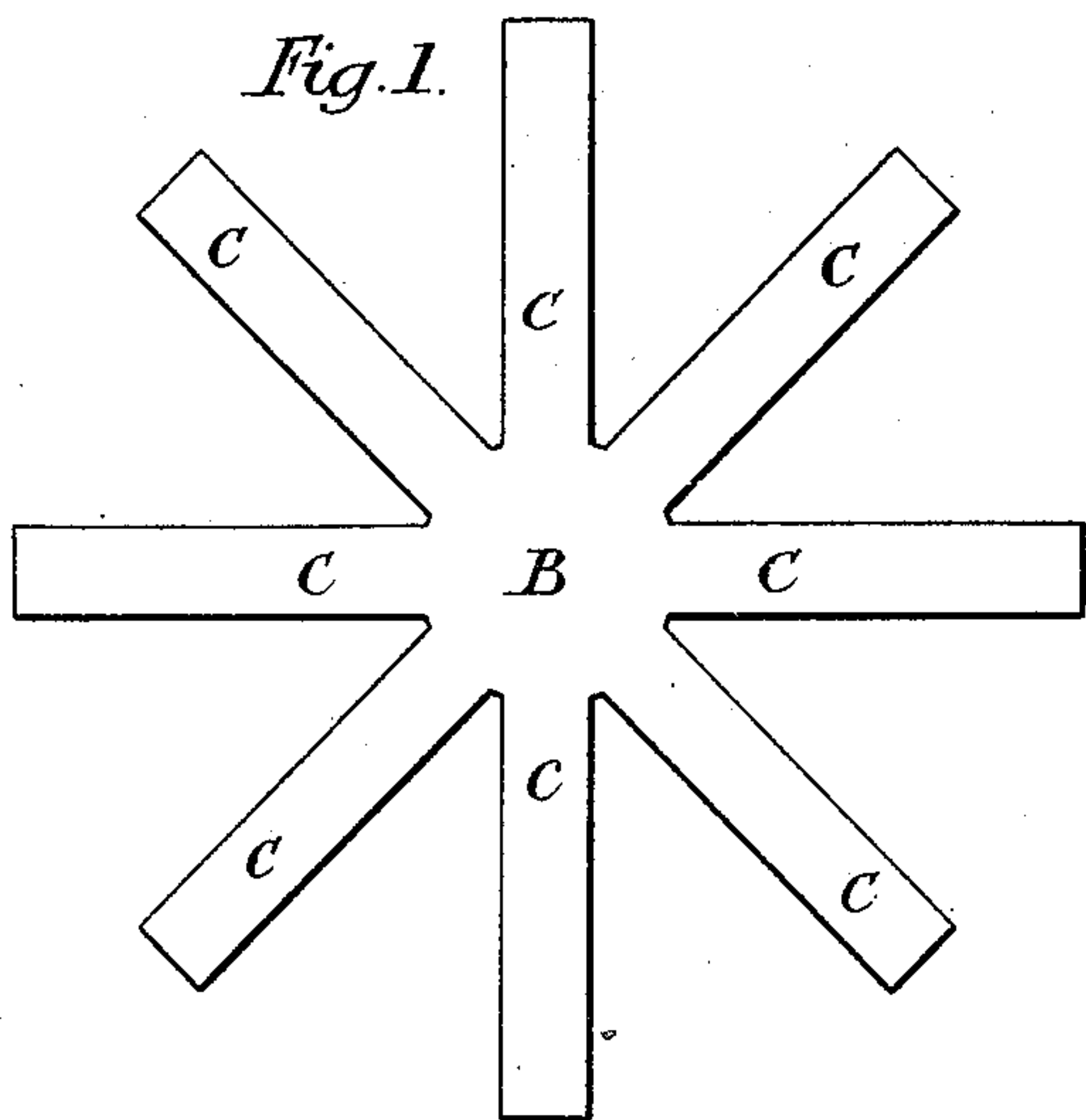


Fig. 4.

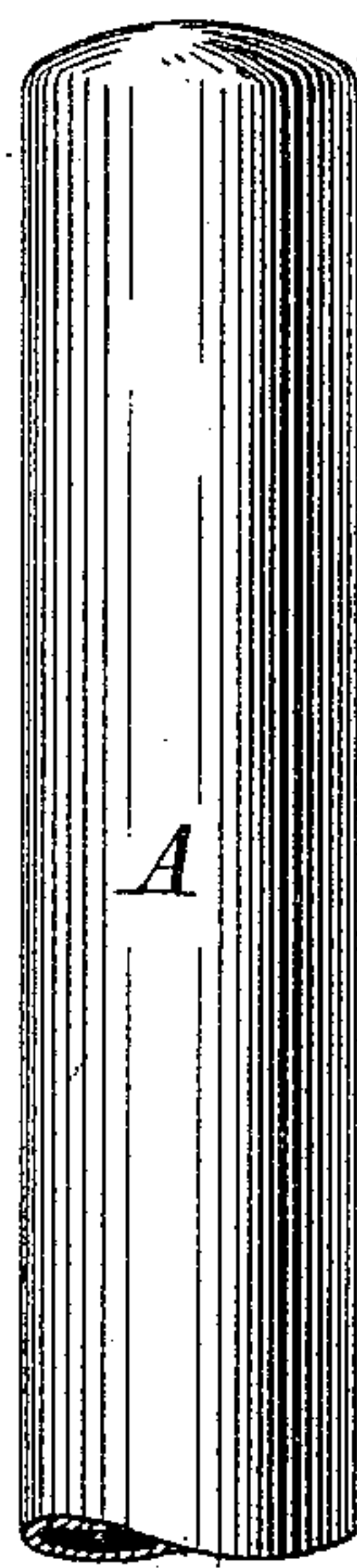
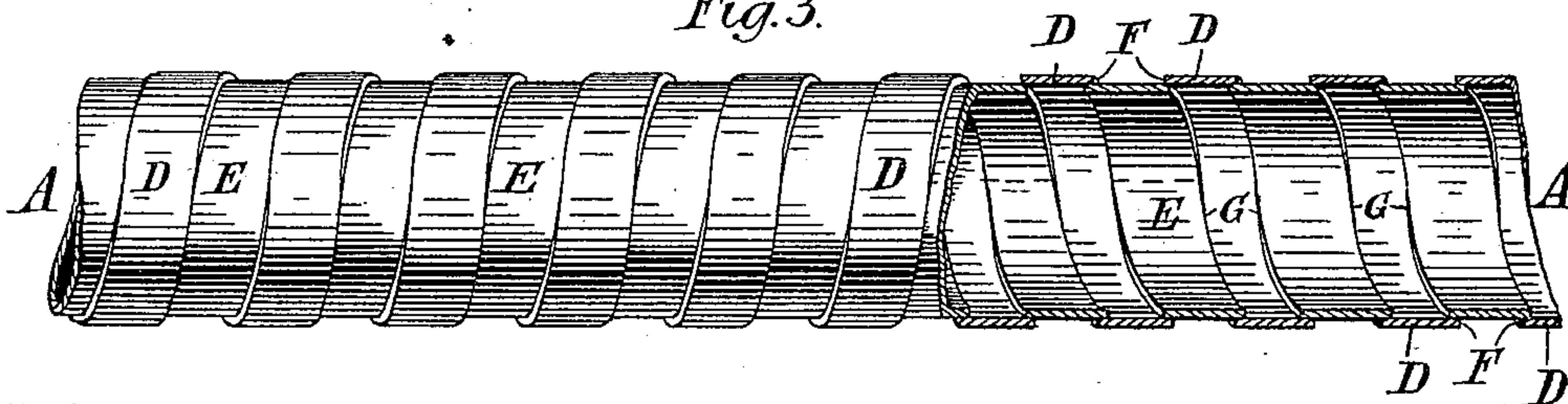


Fig. 3.



Witnesses
Thomas Durant
E. D. Smith

Inventor
Ludwig Nicolai,
By
Church & Church
his Attorneys.

UNITED STATES PATENT OFFICE.

LUDWIG NICOLAI, OF DRESDEN, GERMANY.

CARD-BOARD TUBE.

SPECIFICATION forming part of Letters Patent No. 467,258, dated January 19, 1892.

Application filed January 13, 1891. Serial No. 377,639. (No model.)

To all whom it may concern:

Be it known that I, LUDWIG NICOLAI, a subject of the King of Saxony, residing at the city of Dresden, in the Kingdom of Saxony, German Empire, have invented certain new and useful Improvements in the Manufacture of Card-Board Tubes, of which the following is a specification.

This invention relates to the manufacture of tubes, casks, cases, and other hollow articles of paper, card-board, and similar materials, the invention being particularly directed to two points—first, the forming of the article with a bottom or end, and, second, to the particular arrangement of the spiral strips of which it is composed. The body or walls of the article are composed of spiral strips of the material provided with adhesive material and laid one over another, in addition to which there may be also employed longitudinal strips or complete cylinders of suitable material, which may sometimes with advantage be placed inside or outside the main carcass of the tube formed of the spiral strips. In applying the bottoms or ends to the articles I prefer to proceed in the manner which will be best understood by reference to the accompanying drawings, in which—

Figure 1 is a plan of the end or bottom blank. Fig. 2 shows it in the course of application to the case to which it is to be applied. Fig. 3 represents a portion of a tube with the particular spiral winding above mentioned, and Fig. 4 is an external elevation of portion of a complete case.

Like letters represent like parts throughout the drawings.

A represents the tube-body, which in Figs. 1 and 2 may be made in any desired manner, the bottom piece being capable of application even to an ordinary tube made of a simple sheet of the material rolled up, although for many reasons I prefer to employ the spiral tubes already described in this specification.

B represents the blank or end piece which may be flat or embossed, convex, or concave, and C are radial projecting pieces or bands, the formation of which will be sufficiently understood from Fig. 1 of the drawings. Generally the parts B and C would be stamped out of the same sheet of material and be of the same thickness and consistency; but it will

be readily understood that, if desired, the part B, which forms the bottom of the case, may be reinforced by one or more extra thicknesses of material, either simply as a matter of strength or in order to have a portion fitting inside the case, or, if desired, the bands C may be made separate from the center B and glued or otherwise secured to it, as required.

Fig. 2 shows the attaching of the end piece to the case or body A. The bands C, as will be seen from Fig. 2, are bent up at approximately right angles to the center B, and this may either be done by bending them over when B is in position or it may be done with dies by a separate operation or at the same time that the blank is cut. The end B is fitted onto or into the end of the body A, and the bands C are then pressed down upon the body A and secured in position by gluing or the like. In Fig. 2 the bands C' are shown pressed down onto the body A, the bands C² are shown standing out from the body A, not yet being pressed down upon it, and the band C³ in an intermediate position. When attaching these ends to the improved construction of body above described, the bands C may either be all fastened down upon the body and the subsequent coils wound upon it or a portion of the bands may be first pressed down, then one or more coils of the material may be formed round those, and then the remaining bands put down and another coil or coils made around them. If desired, also, each band C may have one coil of the paper or material of which the body A is to be made wound upon it. Then C may be turned up and the next coil of the paper made underneath it, then C may be turned down and the next coil made above it, and so on, the band and coil being thus interwoven. Generally speaking, the bands C may all be fastened down at once upon the body A, and then other coils wound upon them without any alternate winding or interweaving, the adhesive material employed being found to be amply sufficient to hold the bottom securely. The bands C may be made of any length required, so as to form the longitudinal strips of the case, and with this arrangement, instead of a blank B C being struck, the blank B would be made to fit the case or vessel to which it was to be applied,

and the strips C would then be run along the case, carried over the end, and back again on the other side. All the bands C may be placed entirely inside the body A or entirely outside it, and may be covered or not with a cylindrical shell, which may be placed inside or outside the body A.

The arrangement of the spiral coil shown in Fig. 3 is as follows, the object being to obtain either upon the inside of the body A or upon the outside or both a spiral conformation. This can perhaps be most readily done by making the last lapping coil or coils of the body of a narrower strip D than those E underlying it, if the spiral is to be on the outside, or overlying it if the spiral is to be on the inside. In Fig. 3 the right-hand portion is in section and the left-hand portion is in elevation, and both of these refer to an outside spiral, although, as will readily be understood, the construction of an inside spiral would be substantially the same. Here the bands D and the spaces F between them are of the same width, while the underlying bands E are made broader, so as to allow the strips D to be wider than the spaces G beneath them, and thus to overlap the contiguous bands E and provide holding-space for D. The bands D, however, may be placed upon an already completed body having a smooth exterior—that is, with the edges of the spirals touching—the coils D being laid without any necessary reference to the coils below them. Where this superficial spiral arrangement is required, the coils D forming the spiral may with advantage be made of much thicker material than would be employed for the ordinary strips, so as to obtain a good depth for the spiral; or several strips may be accu-

ately superposed, so as to form the spiral whether inside or outside the tube.

Generally speaking, the articles made according to this invention would be cylindrical or at least circular in cross-section; but it should be understood that the shape of the article depends practically upon the shape of the mandrel upon which it is formed and that the shape of the article can be varied accordingly.

A smooth or ornamental surface may be produced upon the tube or article by covering it either outside or inside with paper or other suitable material. The spiral on the tube may be avoided by making the coils touch.

I claim—

1. The herein-described article of manufacture, consisting of the tubular body formed of spiral strips of paper and having the end formed with the strips C confined and bound to the main body by said spiral strips, substantially as described.

2. As an article of manufacture, the herein-described card-board tube, composed of successive strips of card-board wound spirally one upon another, the first being wound loosely, leaving spaces between each convolution, and the second covering the spaces between the convolutions of the first spiral and overlapping the edges of the same, the overlapping edges being fastened together by paste or cement, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two witnesses.

LUDWIG NICOLAI.

Witnesses:

RUD. SCHMIDT,
EMIL DOMSCH.