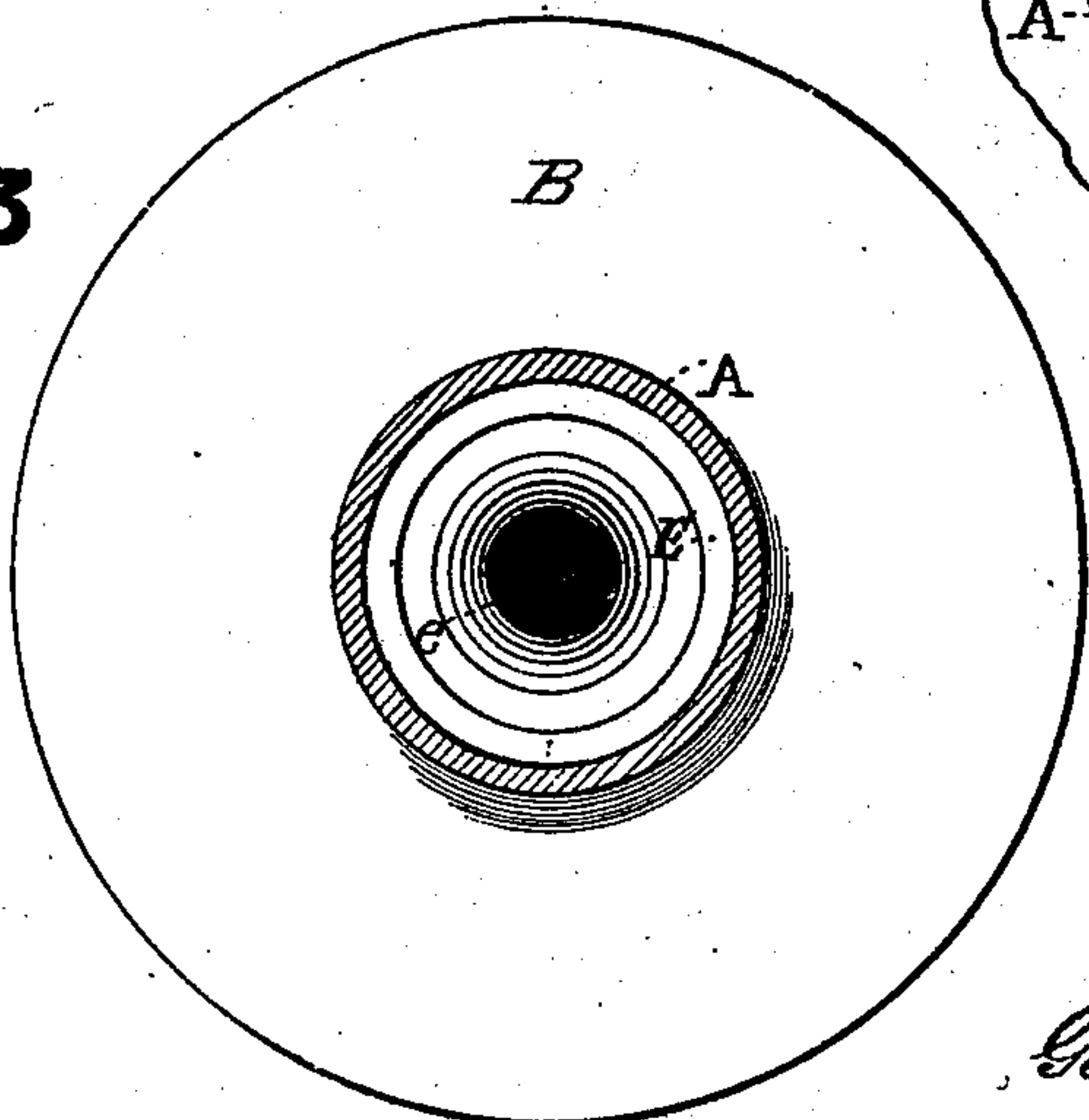
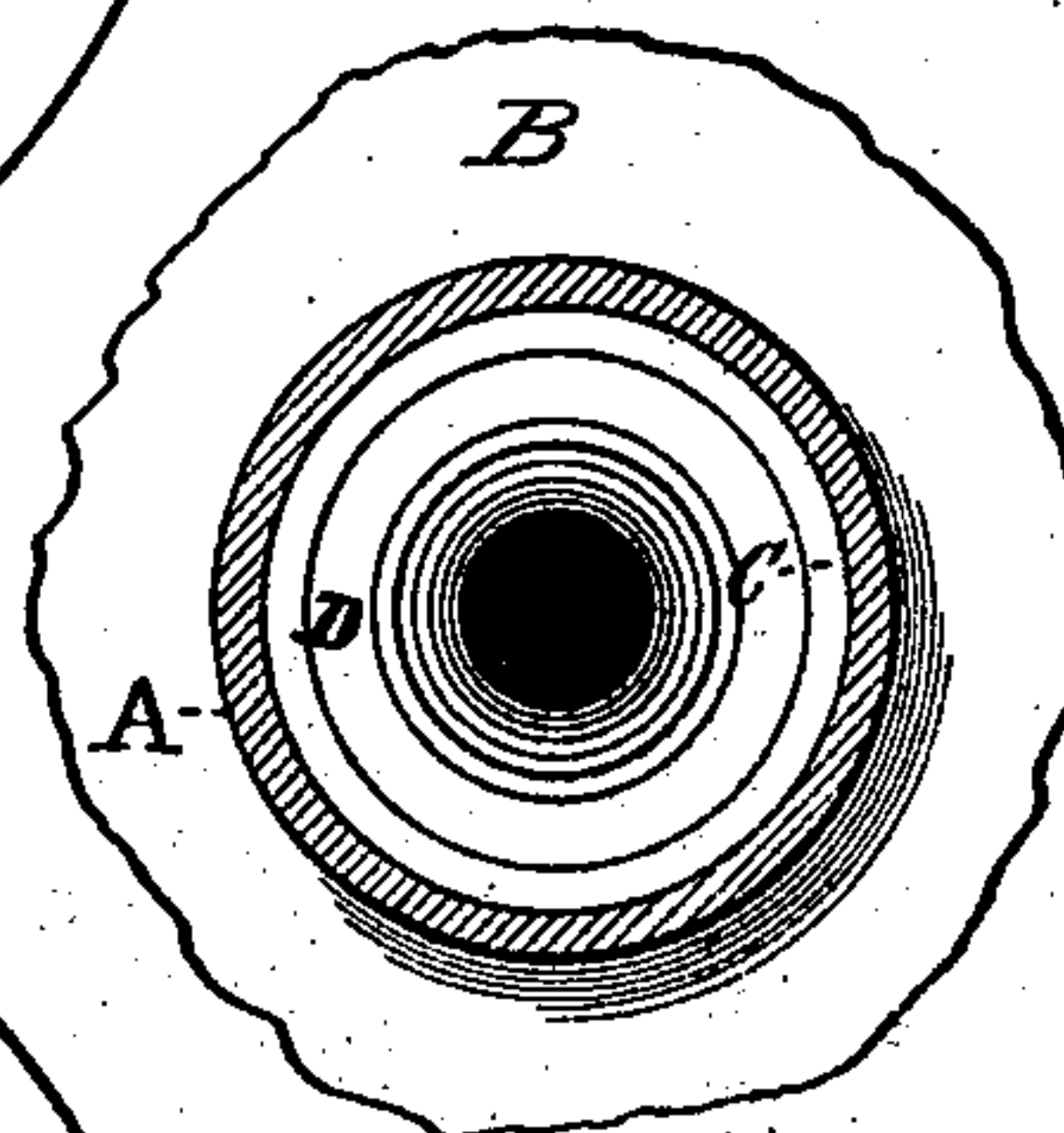
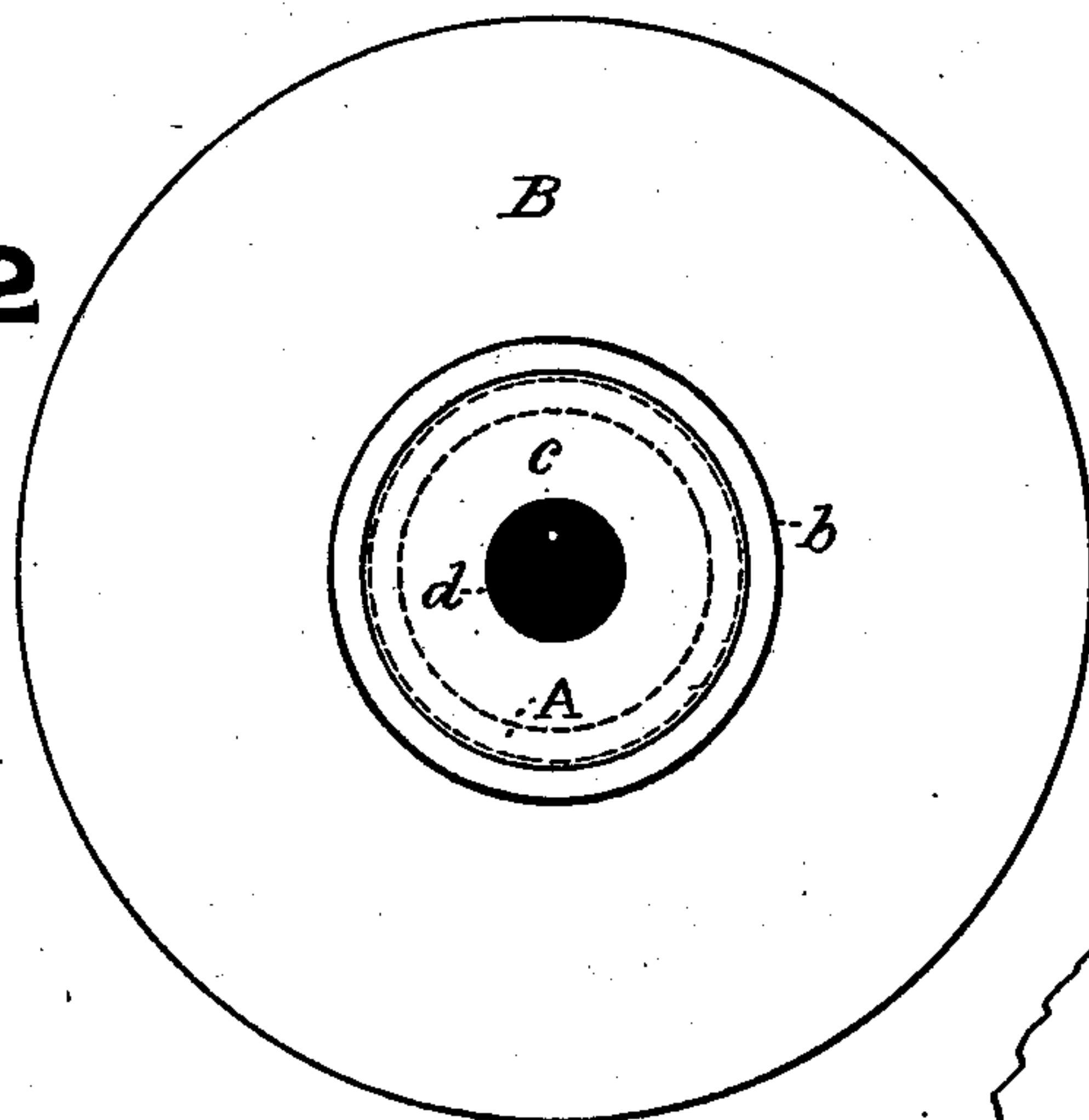
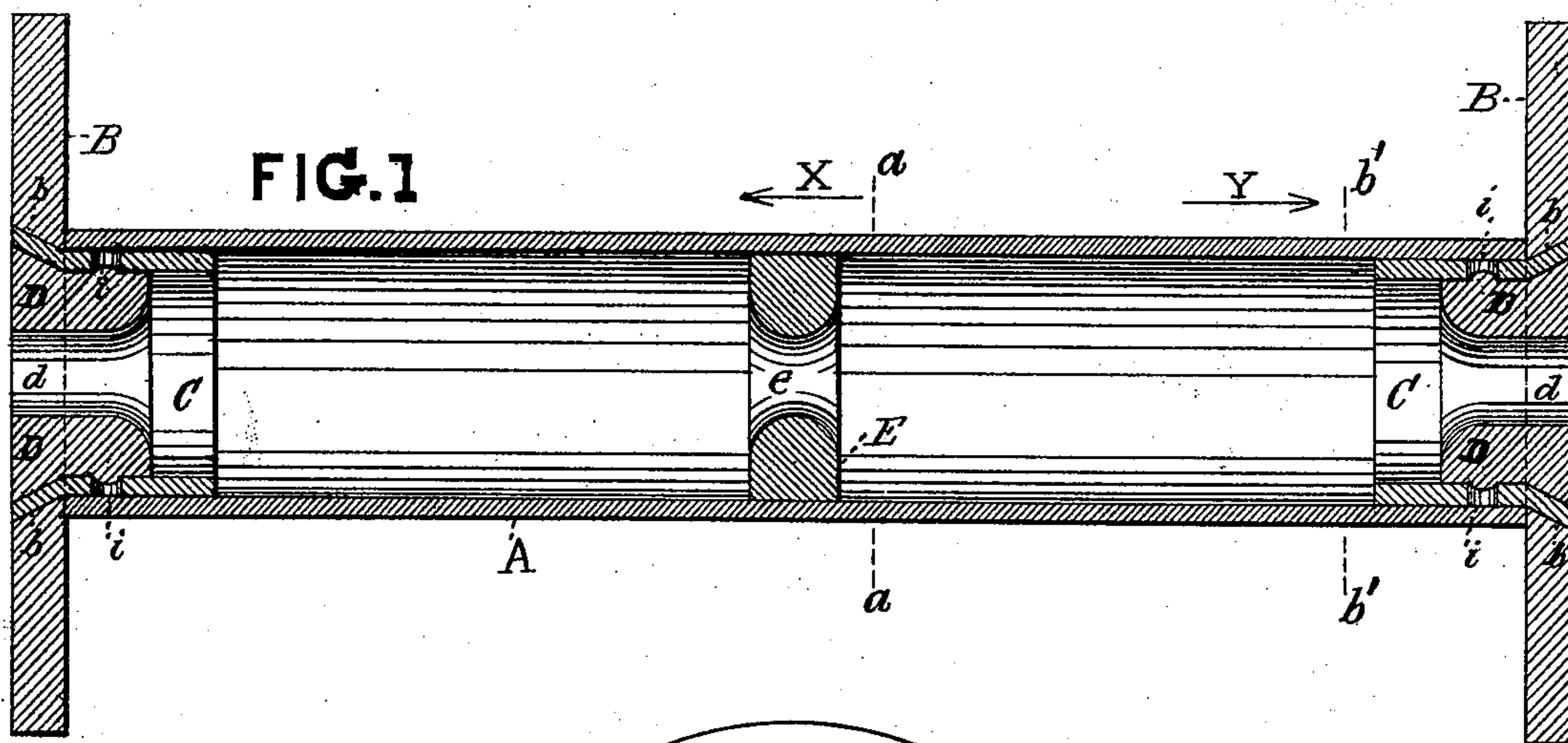


(No Model.)

G. E. GRIMM.  
PAPER BOBBIN.

No. 512,698.

Patented Jan. 16, 1894.



WITNESSES.

S. E. W. Bawling.  
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INVENTOR:

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per, Thomas J. Bewley, atty



# UNITED STATES PATENT OFFICE.

GERHARDT E. GRIMM, OF CAMDEN, NEW JERSEY.

## PAPER BOBBIN.

SPECIFICATION forming part of Letters Patent No. 512,698, dated January 16, 1894.

Application filed April 13, 1893. Serial No. 470,146. (No model.)

*To all whom it may concern:*

Be it known that I, GERHARDT E. GRIMM, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented a new and useful Improvement in Paper Bobbins, of which the following is a specification.

My invention relates to an improvement in the construction of paper bobbins, upon which a continuous strand of thread of cotton, or woolen yarns, tapes, or braid, is destined to be wound for weaving, or other purposes.

It consists of a cylindrical tube having a circular disk, abutting each end at right angles thereto being provided with a flared circular opening in its central portion. Within this tube at each end is placed and securely cemented therein, a short tube, whose outer circumferences are of the same size as the inner circumference of the cylinder. These short tubes have flared ends upon their outer extremities, that are cemented into corresponding circular openings in the end disks and hold the same securely in position with their inner surfaces abutting against the ends of the tubular cylinder, and form the ends of the bobbin, and prevent the displacement of the strands of thread, or yarn wound thereon. A series of circular orifices is also formed in the horizontal material of these short end tubes, about midway of their length, and at equidistant points circumferentially, within which a portion of the material of the end bushings is forced under pressure, while they are in a semi-plastic condition, the parts being previously cemented, thus firmly connecting all the parts of the bobbin together. A circular ring bushing is cemented within the cylinder of the bobbin, previous to its connection with the short tubes and disks, which serves the double purpose of adding strength to the bobbin, and for acting as a guide when slipped over a spindle of a loom.

In the accompanying drawings which make a part of this specification, Figure 1, is a longitudinal section of the bobbin. Fig. 2, is an end view of the same. Fig. 3, is a cross section, taken through the dotted line *a, a*, viewed in the direction of the arrow X. Fig. 4, is a like view, taken through the dotted line *b' b'*, viewed in the direction of the arrow Y,

showing the end of the bushing D. Fig. 5, is a sectional view of the short end tubes C, disk B, and bushing D, previous to attachment to the cylinder A.

Like letters of reference in all the figures indicate the same parts.

A, is the cylindrical tubular portion of the bobbin, whose outer ends rest tightly against the inner surfaces of the disks B,—and upon the outer surface of which the yarn, or thread is destined to be wound.

Within each end of the tube A, is placed a short tubular section C, each section having a flared outer end *b*, that engages with a corresponding circular orifice in the disk B, and is firmly cemented therein, thus forming a bobbin. Within these sections C, are placed the bushings D, each having a longitudinal central bore *d*. The said sections C, have a series of orifices *i*, arranged at equidistant points around the tubular portion, into which a portion of the bushings D, is forced by pressure while in a semi-plastic condition, and serve to hold said bushings in position, and prevent them from being drawn out.

Midway, within the tube A, is arranged the bushing E, (previous to the attachment of the disks B, and sections C,) said cylindrical bushing E having a central orifice, or bore *e*, flared at each end, that serves the two-fold purpose of increasing the solidity and strength of the tube,—and also for acting as a guide to the bobbin, when placed over a spindle of a loom.

The bobbin, constructed as shown and described, with the supplemental end sections and reinforcing bushings D, and the central bushing E, is strong, durable, light in weight for transporting purposes; and when properly cemented together there is but slight liability of breaking, is affected in but a limited degree by variations of temperature, and cannot be readily broken or torn apart, and its cost of manufacture greatly reduced to that of wood.

In shipment to distant points, the various parts could be boxed separately, for convenience, and economy of space, in transportation, and connected together to form the bobbin at points of destination.

I claim as my invention—

The bobbin herein shown and described

consisting of the cylinder A, the supplemental end sections C, having the cylindrical portion and flared outer ends *b*, the bushing D, fitting within the supplemental section, the  
5 disks B, fitted upon the flared outer ends of said section, and the central bushing E, within the cylinder A, substantially in the man-

ner herein shown and described, for the purpose set forth.

GERHARDT E. GRIMM.

Witnesses:

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EDWARD GOVE.