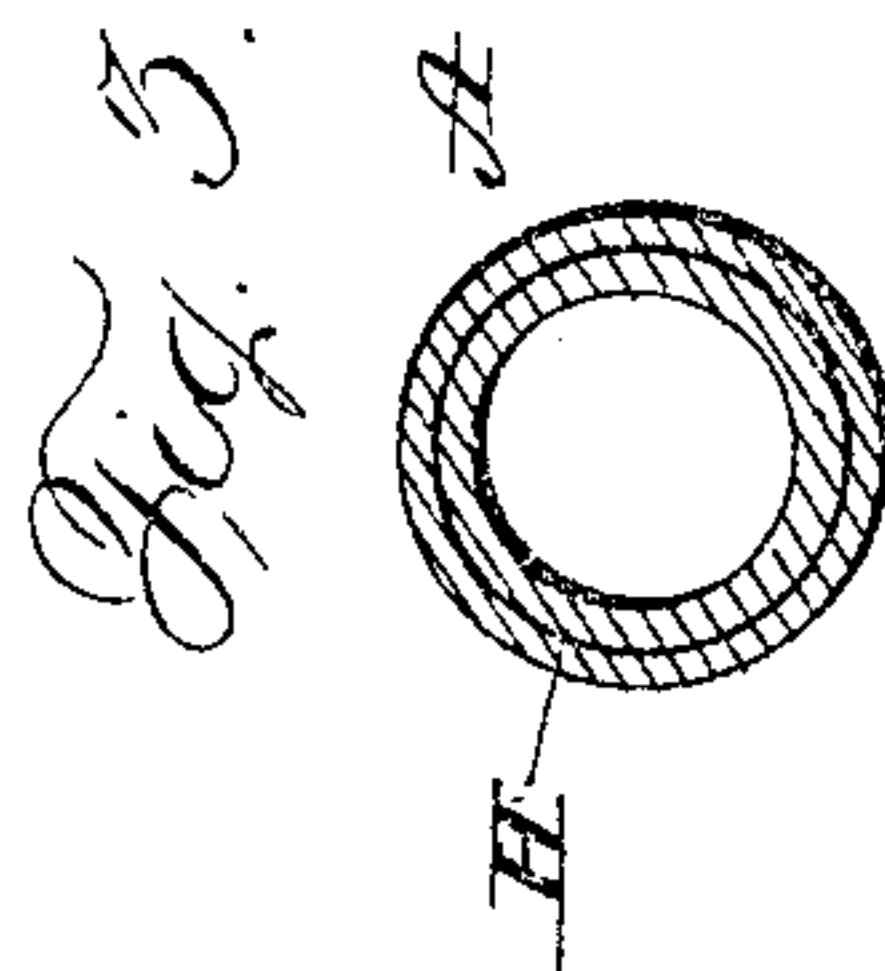
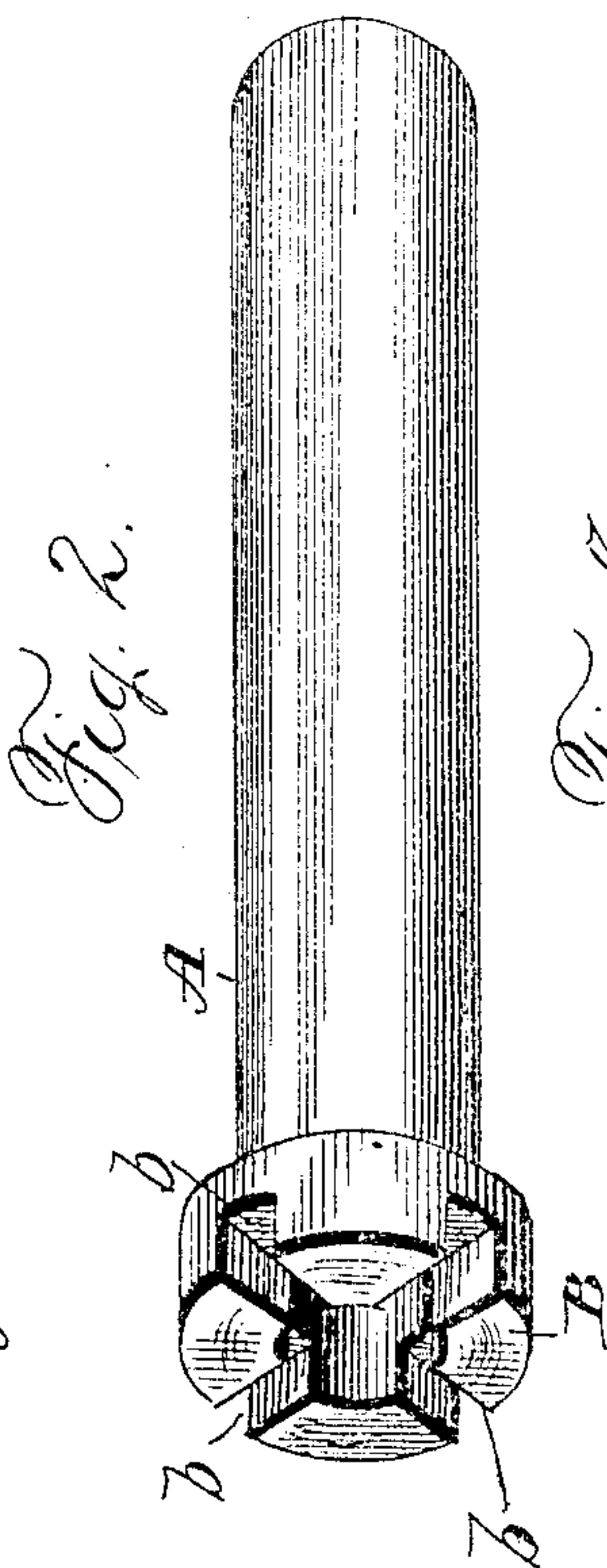
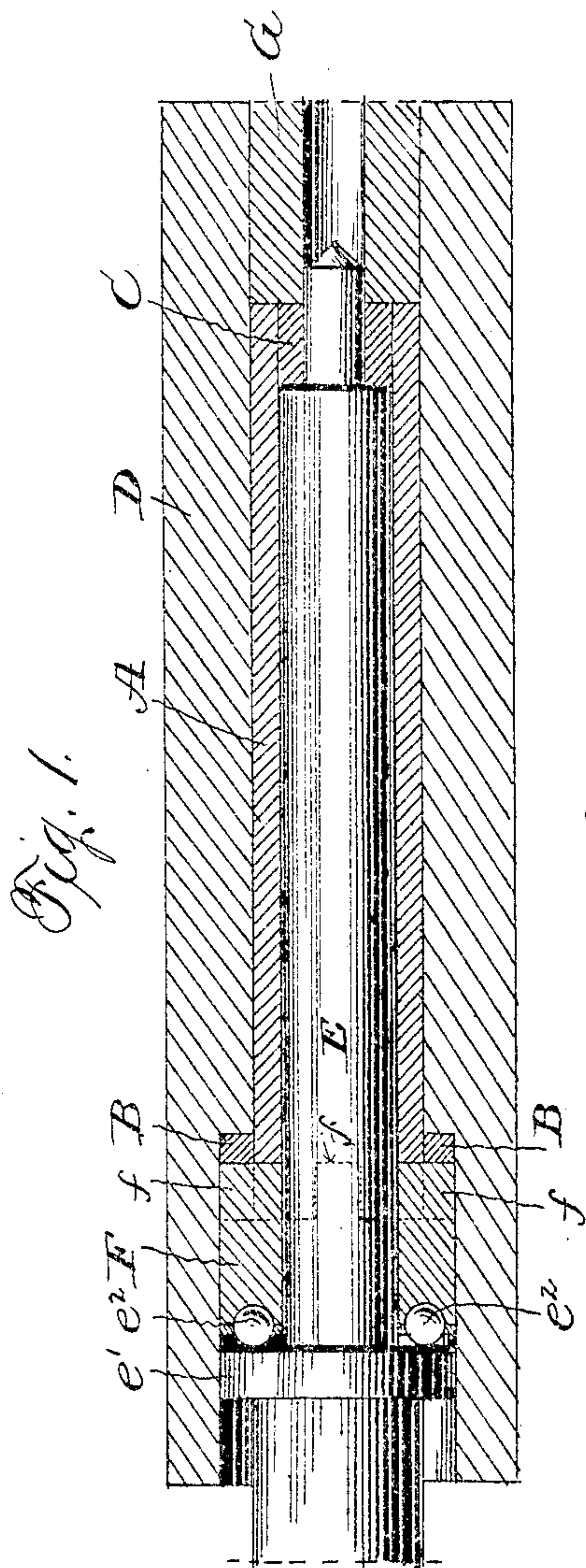


No. 887,621.

PATENTED MAY 12, 1908.

B. GAUSE.
BOBBIN.

APPLICATION FILED OCT. 2, 1906.



Witnesses

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BOBBIN.

No. 887,621.

Specification of Letters Patent.

Patented May 12, 1908.

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To all whom it may concern:

Be it known that I, BENJAMIN GAUSE, of Washington, in the District of Columbia, have invented a certain new and useful Improvement in Bobbins; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section illustrating a manner of making my bobbin; Fig. 2 a perspective view of a bobbin, made in accordance with my invention; and, Fig. 3 is a cross-section of a reinforced bobbin.

The object of my invention is to provide a paper bobbin possessing the important characteristics of strength, durability, and economy of manufacture, and to provide a method of manufacturing such a bobbin, and to these ends my invention consists in the bobbin, substantially as hereinafter specified and claimed.

In the carrying of my invention into practice, I form, in any desired way, a cylindrical paper tube of uniform diameter, as, for example, by means of some tube-forming machine which winds or wraps paper upon a suitable core or mandrel, the tube being formed in this manner of any convenient length and cut up into the required length for the bobbin. At one end, which is the bottom of the bobbin when on the spindle, the bobbin is provided with a collar or enlargement B which, in its outer end, is provided with radial notches *b* to engage the driving lug or pin of the spindle, and at its upper end the bobbin is provided with an internal collar C to reduce the diameter of the bobbin at the upper end to engage the spindle. Both collars B and C are also of paper, which may be produced in the same manner as the tube, and they are applied to the tube A and the radial notches *b* formed in the collar B in the following manner: The collar B, in the form of a short section of tubing or a ring, is slipped over or placed upon the tube A at one end, and the collar C, also in the form of a short section of tubing or a ring, is slipped in the other end of the tube A. The tube with the two collars thus applied is placed in a clamp or holder D, whose internal configuration and size conform to the shape of the tube and the collar B thereon, and thus held, pressure is applied in an endwise direction to both ends of the tube A and

the collars. For thus applying pressure, I employ a mandrel E having a diameter the same as the internal diameter of the tube A, except at one end, where it is reduced in diameter to agree with the internal diameter of the collar *c*, which mandrel is passed longitudinally into the tube, so that a ring or collar F thereon engages the outer end of the paper ring or collar B, which projects a short distance beyond the adjacent end of the tube A, and radial lugs or projections *f* on said ring or collar F, by the continued longitudinal movement of the mandrel, are forced into the paper ring or collar B, and the end of the tube A forming in these parts the radial driving notches *b* of the bobbin, and at the same time compressing the material of the collar B endwise, and thereby causing it to be tightly or firmly affixed to the tube A, such affixing being due to the fact that the material of the tube and collar is confined against any radial movement.

The inner end of the paper ring or collar B is supported by a shoulder on the clamp or holder D. The paper ring or collar C is affixed or attached to the tube A in a similar manner, its inner end being engaged by a shoulder *e* on the mandrel E formed by reducing the diameter of the forward end of the mandrel, so that it passes through, but closely fits, the interior of the paper ring or collar C, and the outer end of said ring or collar and the adjacent end of the tube A are engaged by a second mandrel G, which is given a longitudinal movement in the opposite direction to that of the mandrel E, so that the material of the ring or collar C will be compressed, endwise movement of such material in a radial direction being prevented by the inclosing clamp or holder on the outside and the reduced end of the mandrel on the inside. The mandrel G has a central longitudinal opening for the reception of the protruding end of the mandrel E, such end being pointed or tapered to facilitate the passage of one mandrel over the other. The mandrel E need be given only an endwise or longitudinal movement, in which event the ring or collar F will be fixed thereto, but I preferably give it a rotary, as well as a longitudinal movement, to thereby burnish or shape or smooth the internal surfaces of the bobbin, as well as facilitate the withdrawal of the mandrel from the bobbin after the affixing of the collars B and C thereto, and

with a rotary mandrel it is necessary that the pressure applying ring F thereof be non-rotatable, and, therefore, separate from the mandrel. When thus made separate from the mandrel, as far as rotation is concerned, the ring or collar F is moved longitudinally to act upon the paper collar B, and the tube A, as I have above described, by means of an annular flange or enlargement e' on the mandrel which acts upon said ring or collar E, and to avoid any likelihood of a rotary movement being imparted to the ring or collar F balls e^2 are interposed between the annular flange e' and the end of the ring or collar F.

I have found that, by my invention, the collars B and C may be attached to the bobbin with all necessary security, without the employment of any fastening means, and solely by endwise compression of the paper, as I have described, so that the bobbins can be very cheaply manufactured; and it will be seen that in the case of the collar B, by one operation, the attachment of the collar to the bobbin and the formation of the driving notches are simultaneously done. A highly important feature of my invention is the formation of the driving notches in the bobbin with absolutely smooth or finished and hardened surfaces, there being no exposed or free paper fibers, such as are inevitable when the notches are cut, the result being that the surfaces of the driving notches are capable of resisting wear, and, regardless of the precise manner by which the notches are formed, I desire to cover this feature of my invention, which consists in the provision on a paper bobbin of driving notches whose surfaces are finished or hardened by the compression or compacting of the material at the surface.

Thus, if it should be preferred, instead of forming the notches by compression simply, they could be cut out and afterwards subjected to pressure to compact or compress the surfaces thereof. The notches being formed in both the collar B and the end of the tube A thereat, it will be evident that the formation of the notches in the manner I employ, will result in the interlacing or overlapping to some degree of the contiguous portions of the stock or material of collar and tube, which of course adds to the strength of the union between the collar B and the tube A.

It will be evident that from the pressure which the bobbin is subjected to, by the action of the clamp or holder D and the mandrel E, the tube A which forms the body of the

bobbin, and especially in those portions contiguous to the collars, will be compressed or compacted radially, so that the bobbin produced is of great hardness and strength. This is especially so when the tube is formed by winding or wrapping so that it is composed of numerous longitudinally extending strata or layers.

In the case of those bobbins, such, for example, as are used for spinning, which have light or thin walls, so that, when made of paper they do not possess sufficient stiffness or rigidity, they may be stiffened or reinforced by the application to the tube A of a band H of sheet metal which is introduced into the tube while it is being formed.

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

1. A bobbin having a body consisting of a tube of paper wound or wrapped upon itself, and having a collar also consisting of a tube of paper in a dense or compressed state, the contacting surfaces of body and collar being pressed together in intimate union, which union constitutes the sole attaching means of body and collar.

2. A bobbin having a body consisting of a tube of paper wound or wrapped upon itself, and in a dense or compressed state, and having a collar also consisting of a tube of paper wound or wrapped upon itself and in a dense or compressed state, the contacting surfaces of body and collar being pressed together in intimate union, which union constitutes the sole attaching means of body and collar.

3. A bobbin made of paper, wrapped or wound to form a tube, and a stiffening member wrapped between the layers of paper.

4. A bobbin made of paper having a notch for a driver, the driver-engaging surfaces of the notch being compacted or compressed, whereby the fiber of the paper is preserved intact.

5. A bobbin having a body consisting of a tube of paper, and a collar at one end also consisting of a tube of paper concentric with the body, contiguous portions of the body and collar being indented to form a driver-engaging notch, the indented surfaces being compressed or compacted.

In testimony that I claim the foregoing I have hereunto set my hand.

BENJAMIN GAUSE.

Witnesses:

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