

(No Model.)

C. HARDY.
BOBBIN.

No. 367,622.

Patented Aug. 2, 1887.

Fig. 1.

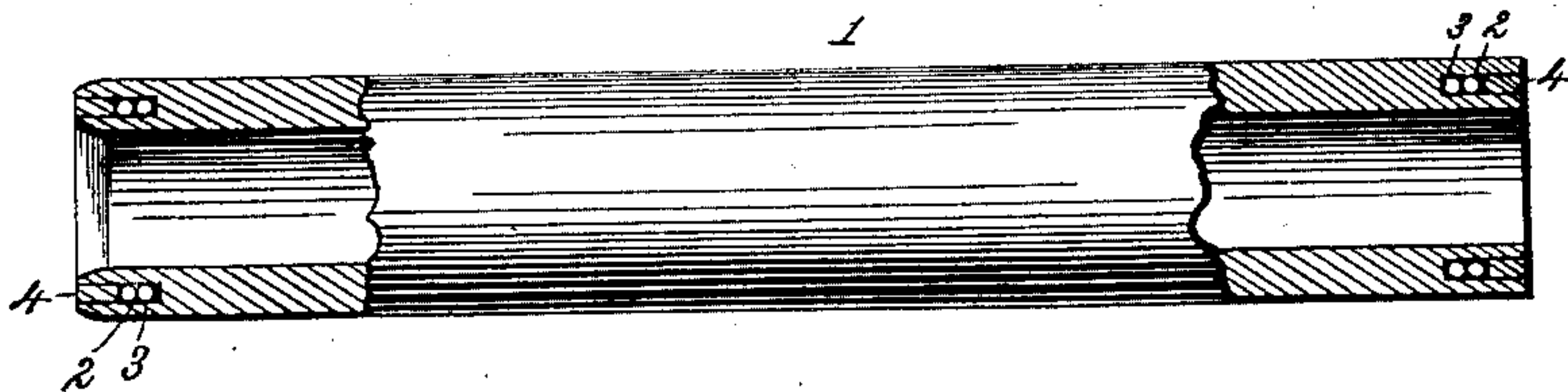


Fig. 2.



Fig. 4.

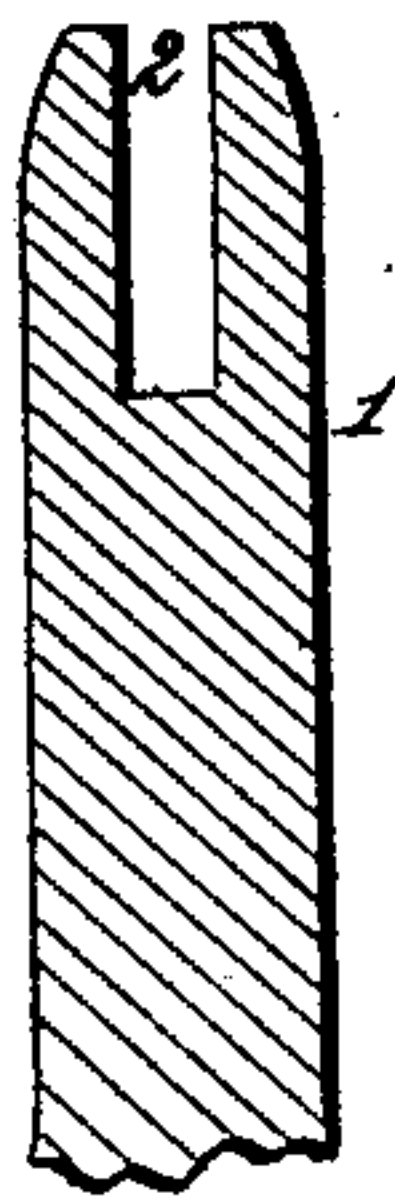


Fig. 3.

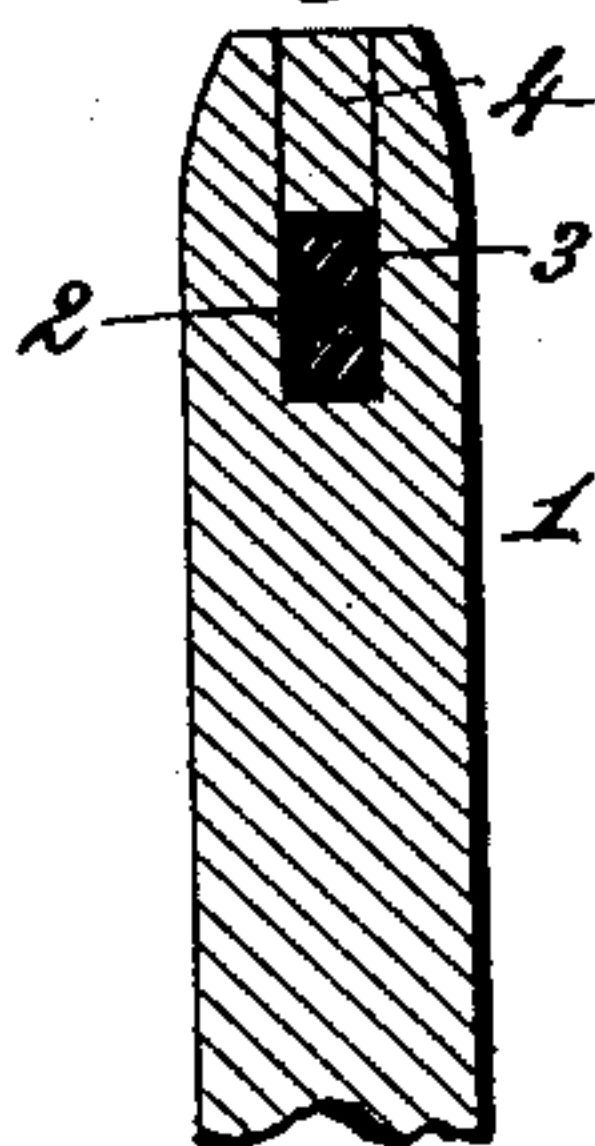
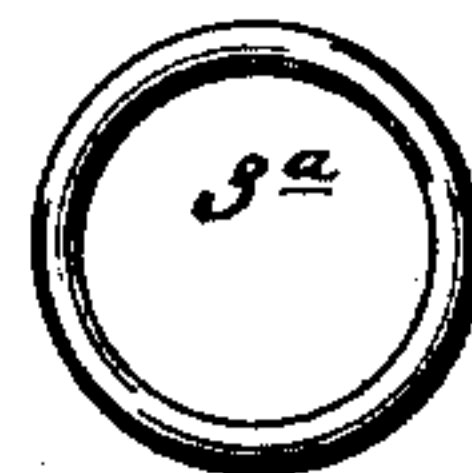


Fig. 5.



Witnesses.
A. R. Brown,
William M. Carter.

Inventor.
Charles Hardy.
By *Chas. D. Piden*
Atty.

UNITED STATES PATENT OFFICE.

CHARLES HARDY, OF NASHUA, NEW HAMPSHIRE.

BOBBIN.

SPECIFICATION forming part of Letters Patent No. 367,622, dated August 2, 1887.

Application filed November 20, 1886. Serial No. 219,474. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HARDY, a citizen of the United States, residing at Nashua, in the county of Hillsborough and State of New Hampshire, have invented a new and useful Improvement in Bobbins, of which the following is a specification.

My invention relates to that class of devices shown in my patent of August 22, 1876, No. 181,436, upon which the present invention is an improvement. It is the purpose of said improvement to provide means for strengthening such articles against inward or outward strain, and to so combine the strengthening ring or re-enforce therewith that it shall be entirely hidden, preserved from contact, frictional or otherwise, and supported upon all sides by the material in which it is embedded. It is a further purpose of my invention to so cover and inclose the re-enforcing ring as to avoid the danger of the checking or splintering and chipping out of the wood in the immediate vicinity of the re-enforce.

The invention consists in the several novel features of construction and new combinations of parts, hereinafter fully described, and definitely pointed out in the claims following this specification.

Referring to the drawings accompanying this application, Figure 1 is a view of a bobbin with the ends in section. Fig. 2 is a detail perspective view of one form of re-enforce. Fig. 3 is an enlarged sectional view of one wall of the bobbin, to more clearly illustrate the construction. Fig. 4 is an enlarged view of the same with the re-enforce and filling ring removed. Fig. 5 is a view of a modified form of the re-enforce.

In the said drawings, the reference-numeral 1 denotes a bobbin, or, as it is sometimes termed, a "quill," of the primitive form, which does not differ materially, so far as my present invention is concerned, from any of the forms now in use. In one or both ends of this quill or bobbin I form an annular cavity, 2, cut parallel with the axis and in such manner as to leave a solid wall of the material of which the bobbin is formed upon both the inner and outer side of said chamber. Within this annular chamber 2 I place a metallic re-enforce, 3, which may be either a coil of two or more

turns, as shown in Fig. 2, formed by winding wire of suitable size upon a mandrel, or a solid ring, like that shown in Fig. 5. The depth of the cavity 2 is such, relatively to the size of the re-enforcing ring or coil, that the latter, when forced into the cavity, will only partly fill the same. Within the outer end of said annular cavity or chamber 2 I then insert a filling-ring or annulus, 4, made of the same material as the bobbin and coated with glue or cement before insertion. This filling-ring closely fits the chamber and completely closes its open end. When combined with the bobbin in this manner, the re-enforce is not only completely concealed from view, but it is wholly inclosed within and supported upon all sides by the walls of the chamber 2 and the end of the filling-ring. By this construction oxidation of the metal of the re-enforce is effectually prevented, and even should the ring oxidate it is entirely shielded from contact with external objects, and the oxidation can produce no injurious results.

Again, when a crushing force is applied to the bobbin externally, the end wall of the cavity 2 upon one side and the filling-ring upon the other give solid support to the re-enforce and compel it to yield or bend only in lines which are radial to the bobbin, whereas if the re-enforce were inserted in an open chamber or cavity without a filling-ring 4, a crushing strain applied to the hollow tube 1 near either end, but not directly over and upon the re-enforce itself, would frequently cause the metal to yield in a direction parallel, or substantially so, with the axis of the bobbin and force the ring or coil out of the cavity containing it. Moreover, in the absence of the filling-ring the metallic oxide, which speedily forms, becomes mingled with the oil or other moisture, and soon penetrates the wood, rendering the bobbin unfit for use. Finally, the filling-ring 4, being firmly glued or cemented in the cavity 2, when the bobbin is accidentally crushed, the wood at the end of the tube which adheres to the filling-ring will not check or splinter and chip out, as it would if the cemented filling-ring were not present; hence the bobbin may, by the insertion of a conical mandrel, be restored to its original shape, and will usually be in as good condition as it was when first constructed.

Heretofore, and prior to my invention, a spool or bobbin has been provided with an annular groove in the end, having a wire re-enforce inserted therein, the wire being wound
 5 or braided with fibrous material saturated with glue. In this invention the re-enforce nearly or entirely fills the annular chamber, and in the absence of the filling-ring it is exposed to oxidation and contact with external objects,
 10 since a comparatively-slight frictional contact will abrade or remove the fibrous sheath or covering and expose the metal in the open end of the annular chamber. This construction is open to all the objections specified, and
 15 has been found incapable of practical use.

In another invention a re enforcing ring composed of a compound of glue, glycerine, and sulphate of lead has been applied to the exterior of a bobbin at or near the end, and
 20 a re-enforce composed of the same materials has been placed in an annular chamber in the end of the bobbin, no filling-ring being employed.

Finally, in my own patent, No. 181,436,
 25 hereinbefore mentioned, a metal re-enforce is employed, held in place by a bushing; but instead of an annular chamber cut in the end of the bobbin the inner surface of the latter is chamfered or gained, and the re-enforce is
 30 set therein with its inner face wholly exposed, and the filling-ring is then inserted, its inner surface being without support. With this construction the re-enforce is exposed to oxidation, and when the bobbin is crushed the filling-ring is extremely liable to splinter excessively,
 35 because of its want of support upon its inner face, and when the bobbin is restored to shape pieces of said ring are liable to chip out and fall off. The same or a similar result is
 40 met with in all cases where no filling-ring is employed, cemented to both the inner and outer walls of the annular chamber.

By my invention great strength and durability are imparted to the bobbin by the support of the re-enforce upon all sides. Oxida-

tion of the metal is entirely avoided, and should the tube be accidentally crushed it may be restored to shape without causing the wood to check out and expose the re-enforcing ring. Moreover, by entirely inclosing the ring I am
 50 able to dispense with anything like a fibrous coating or covering, and am able, therefore, to employ a much thicker re-enforce than would be possible if the metal were wound before inserting it. Finally, the filling-ring being of the same material and of the same grain
 55 as the bobbin when the same is cemented in and the wood dressed down to finish the bobbin, the latter becomes, both in appearance and practical use, the same as if the whole
 60 were formed of one solid piece with a metal re-enforce embedded. My invention is the same whether the solid ring 3 or the spiral coil 3^a is employed.

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

1. A bobbin having an annular cavity or chamber in its end, in combination with a metallic re-enforce partly filling said chamber, and a filling-ring inserted in and wholly closing
 70 the open end of said chamber, substantially as specified.

2. A bobbin having an annular cavity or chamber cut in its end, in combination with a metallic re-enforce partly filling said chamber,
 75 and a filling-ring cemented in the open end of said chamber, the re-enforce being supported and inclosed on three sides by the walls of said annular chamber and upon the fourth side by the filling-ring, substantially as specified.
 80

3. The combination, with the bobbin 1, having an annular chamber, 2, in its end, of a spiral re-enforcing coil, 3, and a filling-ring, 4, all constructed and arranged substantially as specified.

CHARLES HARDY.

Witnesses:

C. L. LOVELAND,
 R. T. SMITH.