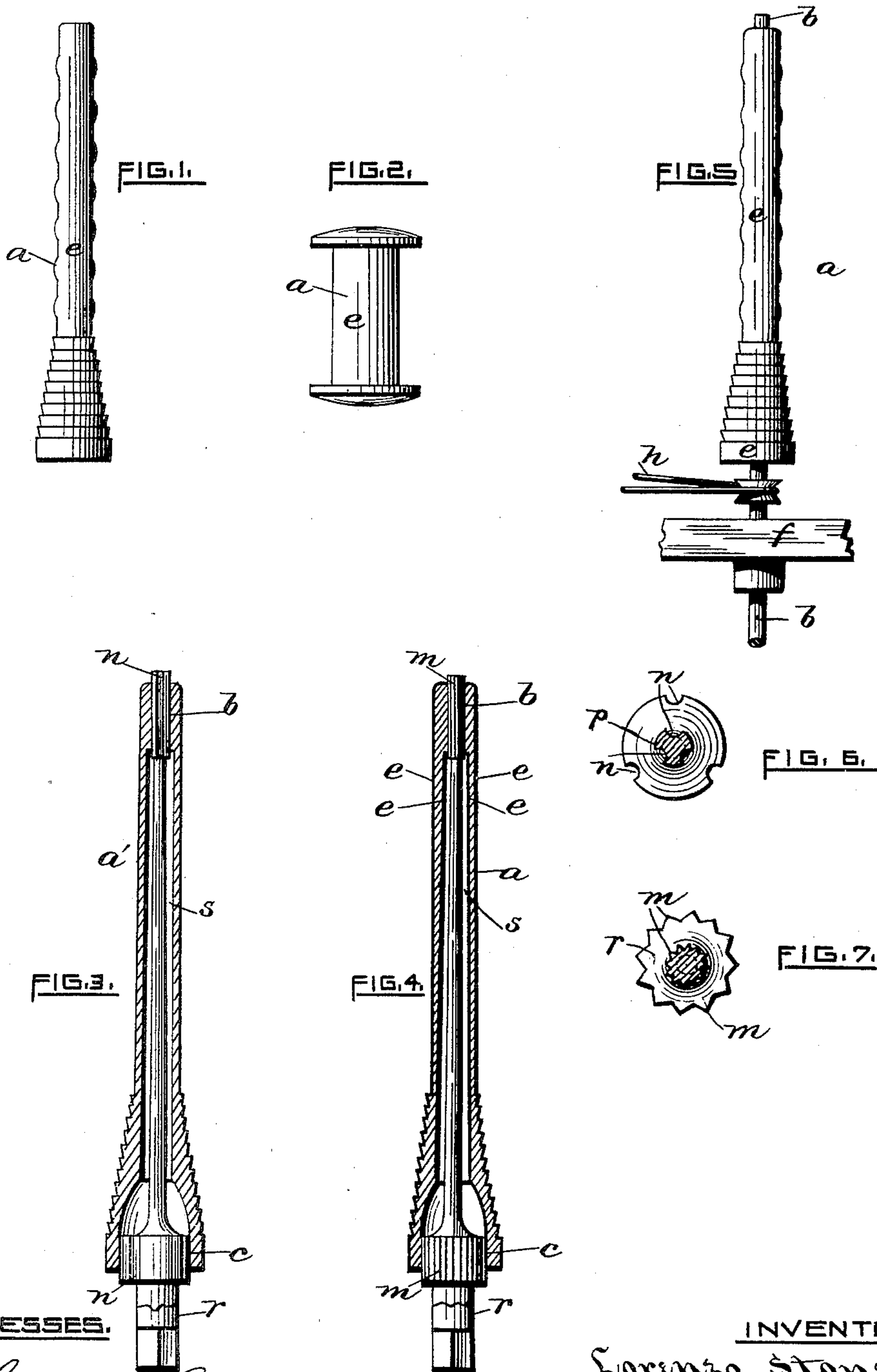


(No Model.)

L. STONE & A. O. AUSTIN.
METHOD OF ENAMELING BOBBINS, &c.

No. 398,670.

Patented Feb. 26, 1889.



WITNESSES.

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LORENZO STONE AND ALONZO O. AUSTIN, OF PROVIDENCE, RHODE ISLAND.

METHOD OF ENAMELING BOBBINS, &c.

SPECIFICATION forming part of Letters Patent No. 398,670, dated February 26, 1889.

Application filed June 19, 1888. Serial No. 277,608. (No model.)

To all whom it may concern:

Be it known that we, LORENZO STONE and ALONZO O. AUSTIN, citizens of the United States, both residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in the Method of Enameling Bobbins, &c.; and we 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

In the method of enameling bobbins, spools, quills, or other analogous articles made of wood, it is practically found to be impossible to deposit upon the interior surfaces thereof a uniform layer or coating of Japan enamel, owing partly to the rapidity with which the work is performed. In the class of articles referred to it is desirable that not only the exterior surface but also the surrounding surface of the hole, which passes through the bobbin for the reception of the driving-spindle, be protected by baked enamel. By reason of the enameled surface the bobbins are rendered impervious to the action of steam, water, oil, &c., and are also unaffected by changes in temperature, another advantage being that the yarn unwinds from them more freely.

Our invention resides in subjecting wooden bobbins, spools, &c., to a method embracing, essentially, the following-named steps, viz: first, in baking the bobbin ("in the white") in an oven heated to a temperature, say, of 250°, to evaporate the moisture, the baking operation acting also to slightly contract the spindle-hole; second, after removing the bobbin from the oven, the hole is reamed out so as to make it true, and also somewhat larger than the finished hole is to be; third, the reamed bobbin is next enameled by covering its exterior and interior surfaces with one or more coatings of Japan varnish, and placing it within a heated oven, which latter hardens the varnish, thereby producing a hard-baked coating called "enamel;" fourth, the enameled bobbin is now submitted to the action of

a finishing-reamer, which is run into the spindle-hole a predetermined depth, the reamer being made to ream a hole having the exact size of the spindle upon which the bobbin will be mounted when in use. The reamer also removes any irregularities from the interior surface produced during the enameling operation.

After the reaming operation and after the reamer has been withdrawn from the bobbin, more or less enameled chips or dust remains, which cannot be readily removed by shaking or jarring, and in order to provide for the absolute trueness of the running of the bobbin when applied to the spindle we render the removal of all chips or dust certain by placing the reamed enameled bobbins upon a mounted spindle and running them at a high velocity. By reason of this rapid rotation the bobbins are thoroughly cleaned from all chips or dust, and at the same time the bobbins are tested and any imperfections discovered.

In order to more clearly set forth our invention, we have prepared the accompanying sheet of drawings, in which—

Figure 1 represents a perspective view of an ordinary bobbin having an enameled surface. Fig. 2 is a similar view of an enameled spool. Fig. 3 is a longitudinal sectional view taken through the center of a wooden bobbin after it has been subjected to the baking-oven, (prior to being enameled,) and showing a reamer in the act of truing the spindle-hole. Fig. 4 is a similar sectional view after the bobbin has been fully enameled, and showing a reamer in the act of finishing the hole for the reception of the driving-spindle. Fig. 5 shows the bobbin thus enameled and reamed mounted upon a driven test-spindle; and Figs. 6 and 7 represent enlarged cross-sectional views of reamers adapted to ream the bobbin before and after the enameling, respectively.

A detailed description of our improvement is as follows:

As hereinbefore stated, the bobbins, spools, &c., to which our invention is more particularly applicable are those which are made of wood.

In the drawings, *a'*, Fig. 3, designates a wooden bobbin of ordinary construction, hav-

ing an enlarged opening or bearing, *c*, formed in its base to receive the collar of the driving-spindle, and having a smaller opening, *b*, in the opposite end to receive the upper portion of the spindle, the space *s*, intermediate of the end portions of the bobbin, being enlarged. Now, from the fact that bobbins shrink more or less during the baking of the enamel thereon, thereby producing irregular spindle-holes, which during the reaming process frequently exposes the wood, we first subject the bobbins to a high temperature (before enameling) approximating that employed in enameling. Such heat causes the moisture to be evaporated from them, and also acts to reduce the size of the spindle-hole somewhat. We next ream out the hole by means of a suitable tool, the reamer *r*, Fig. 3, serving for this purpose. This reaming operation, it will be noticed, produces a true hole in the now thoroughly-dried bobbin, the size of the hole being slightly larger than the finished hole is to be, thus allowing for the interior coating of enamel. The next step consists in covering the reamed bobbin with one or more coats or layers of Japan varnish and subjecting it to the baking-oven, which causes the varnish to harden, thereby producing a durable and impervious surface both upon the exterior and interior of the bobbin. As this enameling operation tends to reduce the size of the spindle-hole, at the same time making it more or less irregular, we next introduce into the bobbin a revolving reamer, *r*, Fig. 4, being the exact counterpart at the bearing-points of the

driving-spindle, thereby reaming the hole and adapting the bobbin for use. In order, however, to put the enameled and reamed bobbin to a practical test, to determine its steadiness of running, we mount it upon a rapidly-revolving test-spindle, *b*², Fig. 5. By thus testing each bobbin at the factory before shipment, the unbalanced and otherwise defective ones are developed and then discarded.

We do not limit the application of our invention to the form of bobbin, &c., shown in the drawings, as it is obvious that other styles may be advantageously adopted, the reamer being modified accordingly without departing from the spirit of the invention.

We claim as our invention—

The improvement in the method of enameling bobbins, spools, &c., which consists, first, in subjecting the bobbin to a high temperature before enameling; second, reaming the spindle hole or center; third, covering the exterior and interior surfaces of the bobbin with enameling material, as Japan varnish, and baking it thereon, and, fourth, in reaming the enameled surface of the spindle-hole to fit the driving-spindle, substantially as hereinbefore described and set forth.

In testimony whereof we have affixed our signatures in the presence of two witnesses.

LORENZO STONE.

ALONZO O. AUSTIN.

Witnesses:

CHARLES HANNIGAN,
F. A. SMITH, Jr.