

No. 688,380.

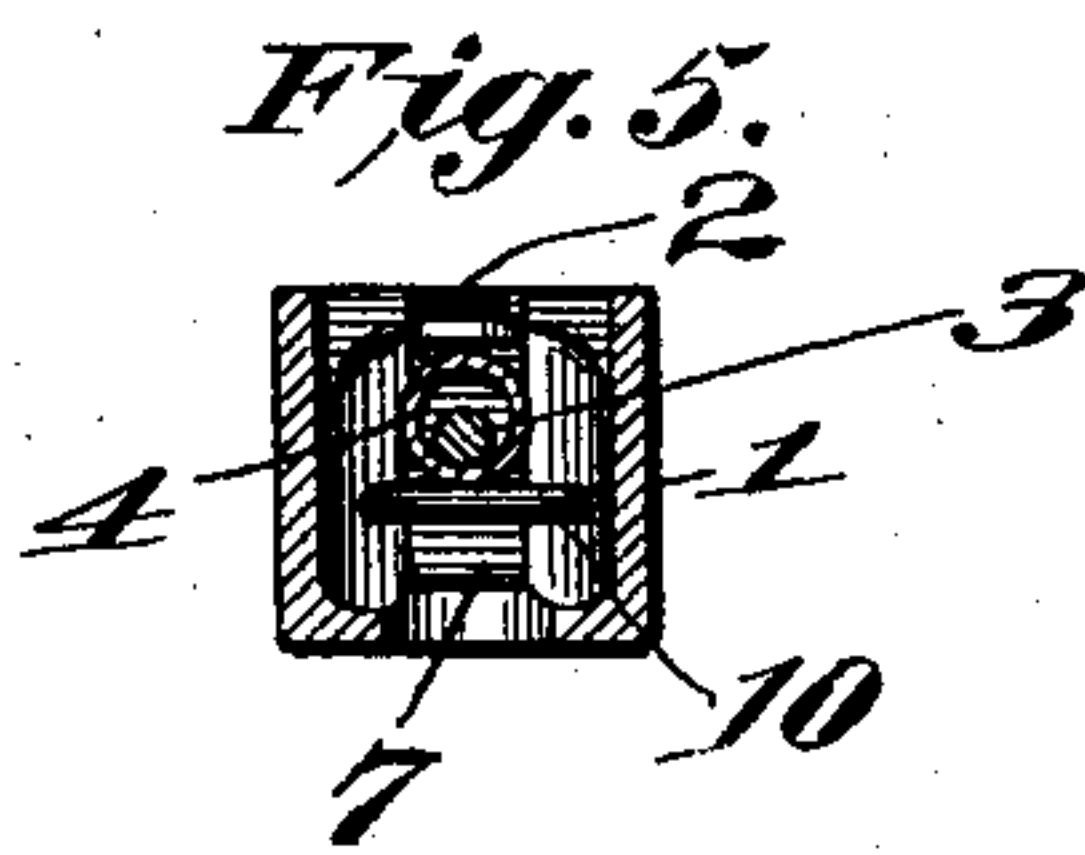
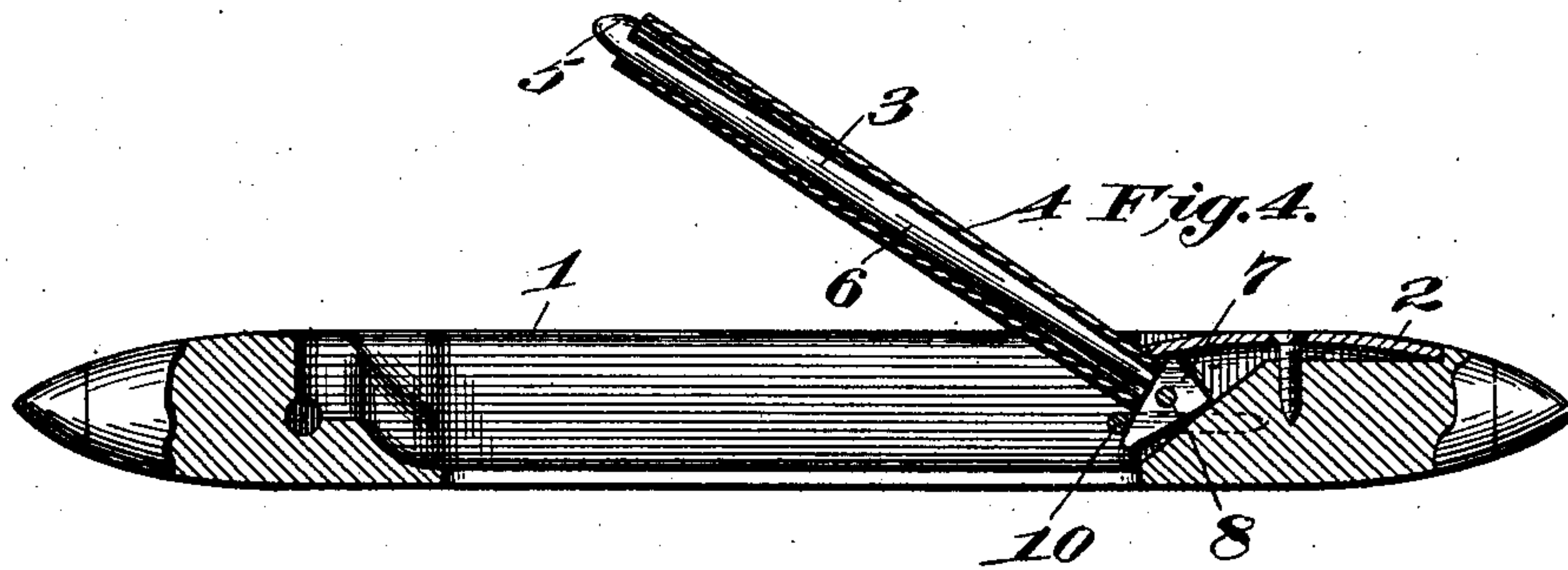
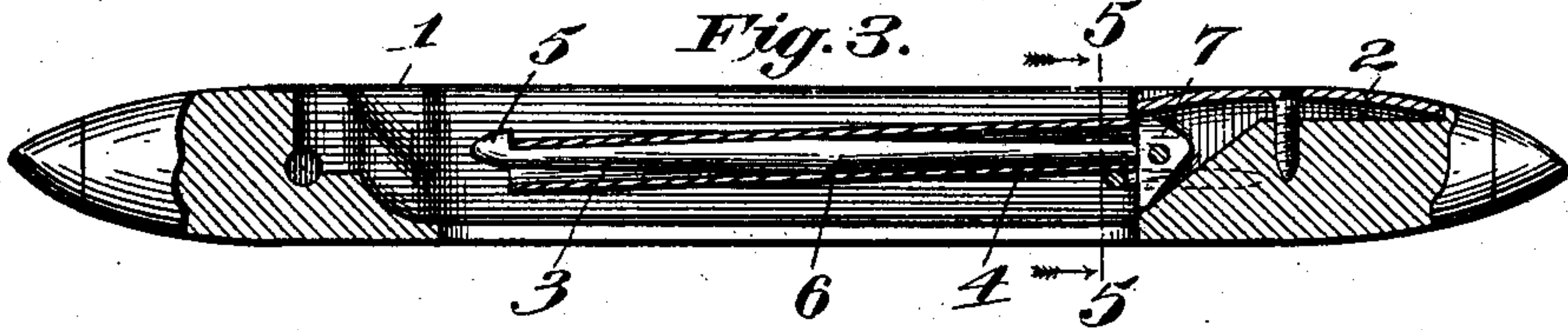
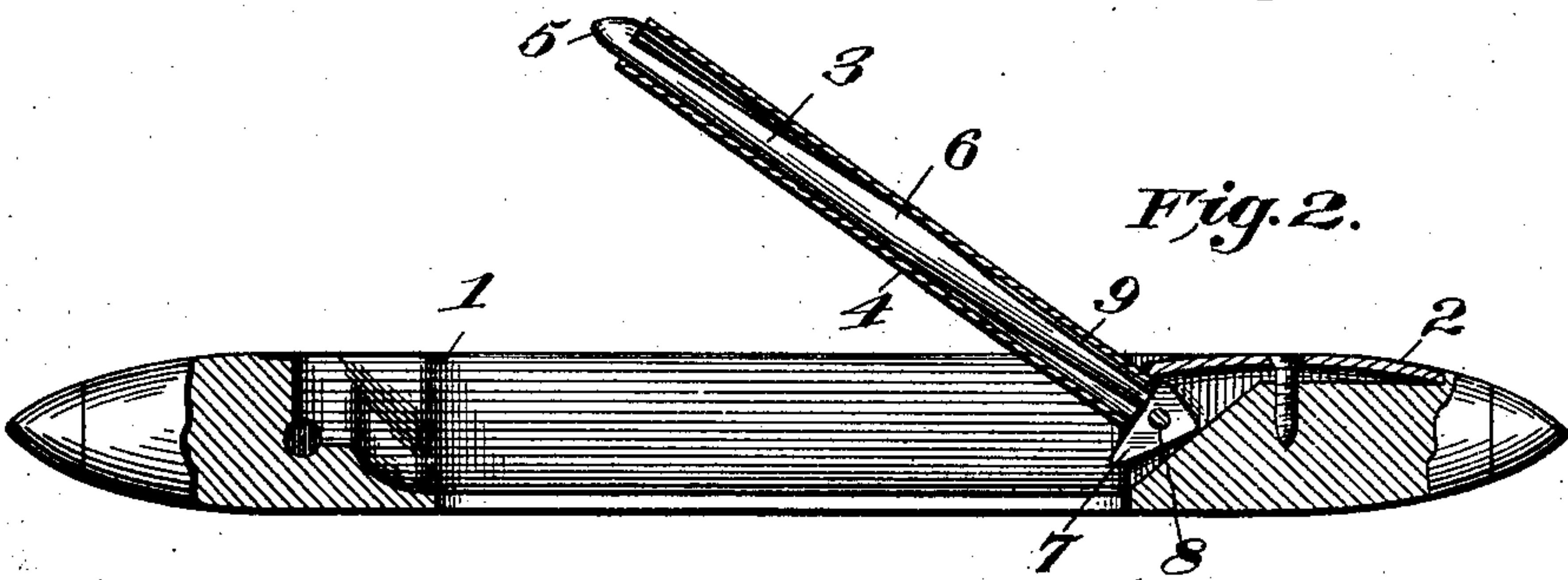
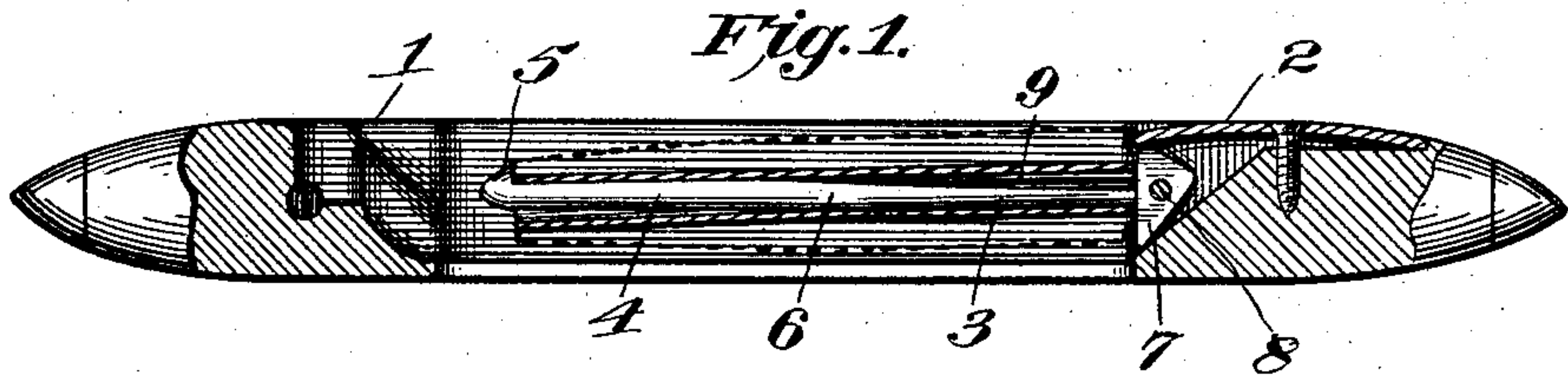
Patented Dec. 10, 1901.

A. AVERY.
LOOM SHUTTLE SPINDLE.

(Application filed Apr. 18, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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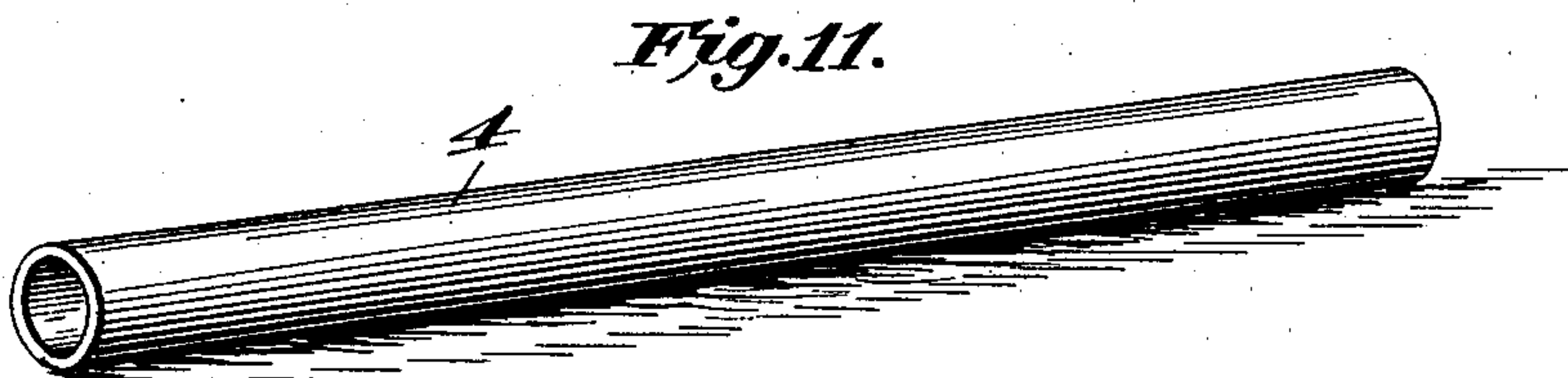
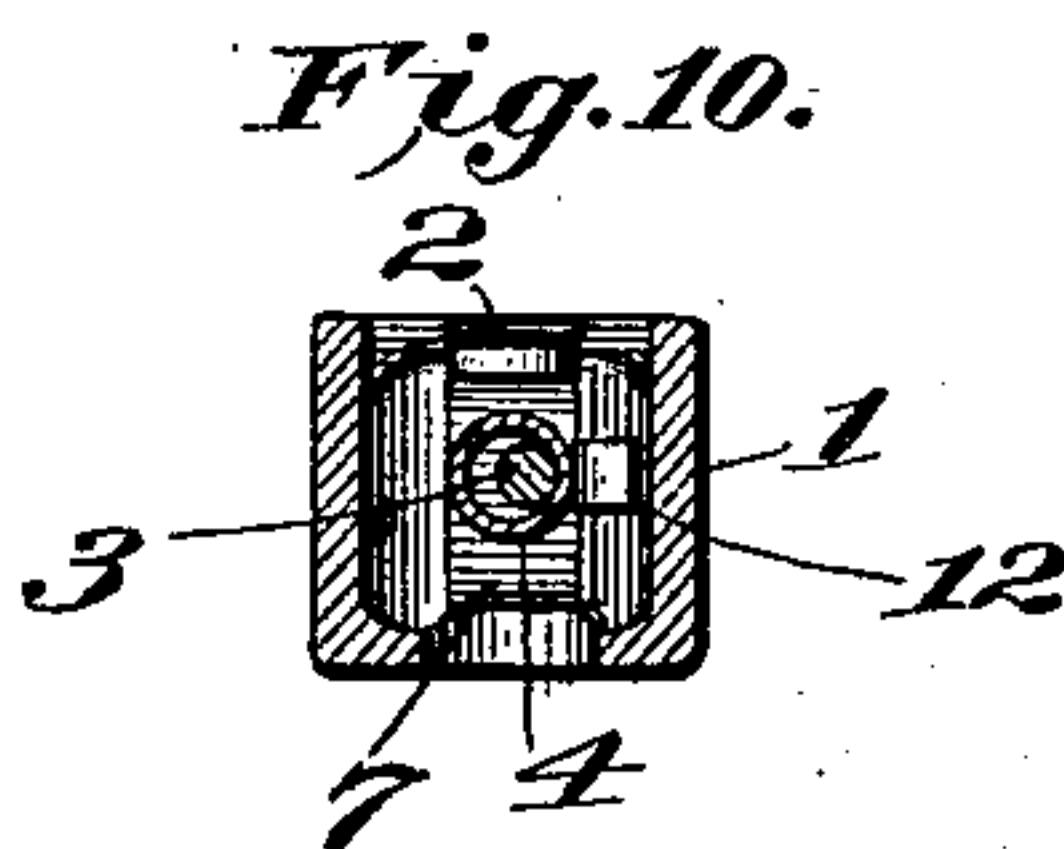
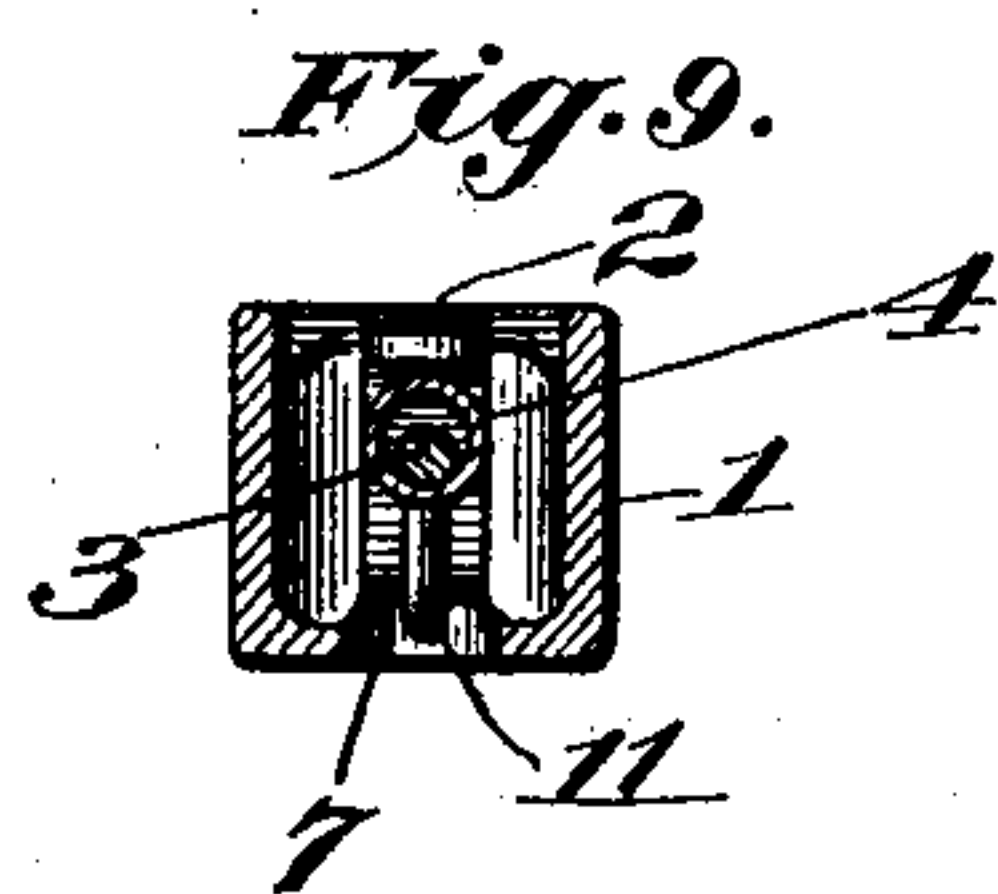
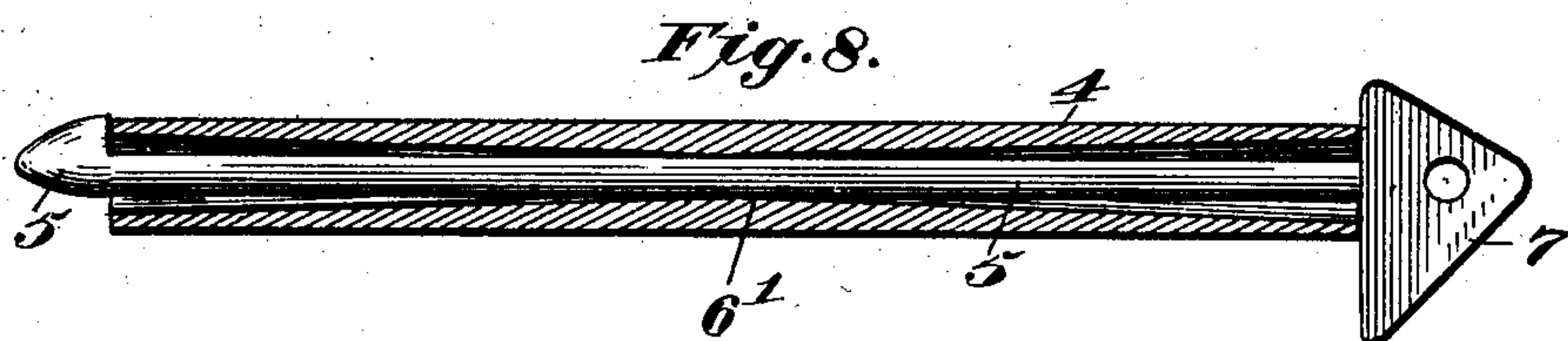
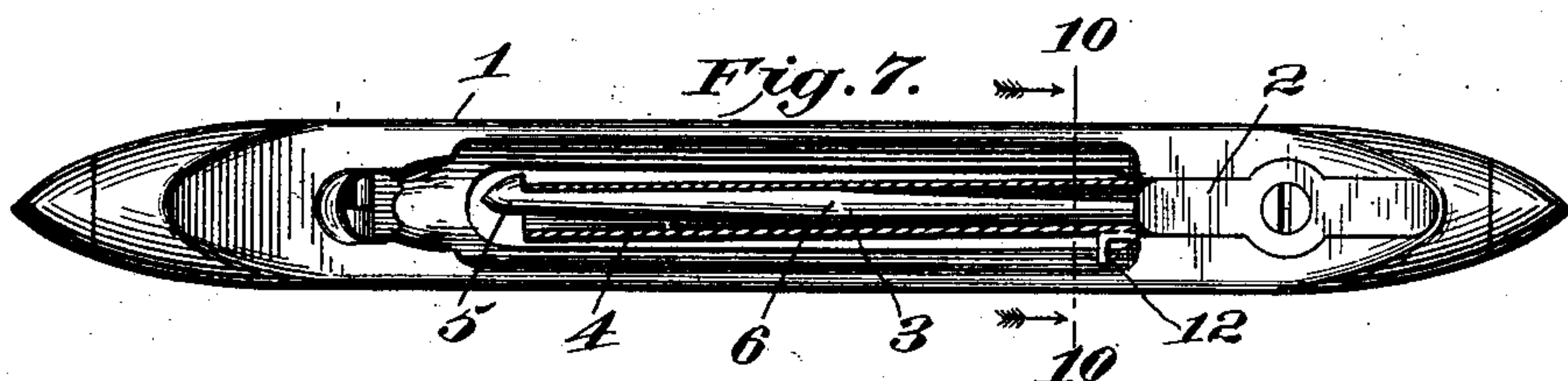
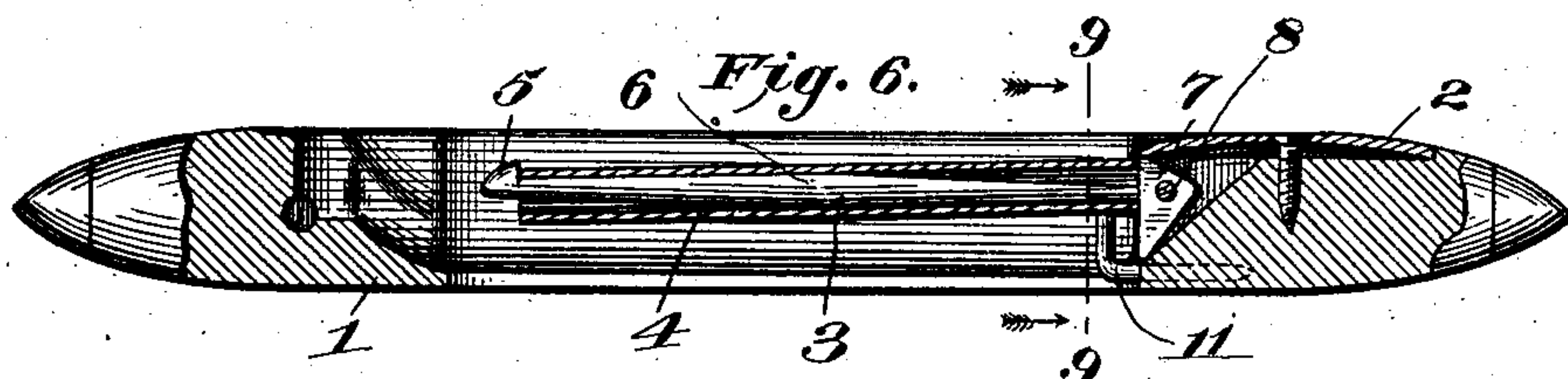
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

AMARIAH AVERY, OF MANCHESTER, NEW HAMPSHIRE.

LOOM-SHUTTLE SPINDLE.

SPECIFICATION forming part of Letters Patent No. 688,380, dated December 10, 1901.

Application filed April 18, 1901. Serial No. 56,384. (No model.)

To all whom it may concern:

Be it known that I, AMARIAH AVERY, a citizen of the United States, residing at Manchester, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Shuttle-Spindles; and I do 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.

This invention relates to improvements in shuttle-spindles, and has for its object to provide a spindle of improved construction whereby the bobbin is automatically locked upon the lowering of the spindle and released upon the raising of the spindle within the shuttle.

The invention consists in certain novel features of construction, combination, and arrangement of parts, which will be hereinafter more fully described, and particularly set forth in the appended claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal section through a shuttle equipped with my invention, the tube of the spindle appearing in section and the spindle in its lowered position. Fig. 2 is a similar view showing the spindle raised. Figs. 3 and 4 are views similar to Figs. 1 and 2, showing a modification in the means for tilting the spindle-tube when the spindle is lowered to lock the bobbin. Fig. 5 is a cross-section on the line 5 5 of Fig. 3. Fig. 6 is a vertical longitudinal section also showing a modification in the means for tilting the spindle-tube to lock the bobbin. Fig. 7 is a top plan view, the spindle-tube appearing in section, showing a still further modified construction in which the spindle-tube is mounted to tilt laterally or sidewise instead of vertically to lock and release the bobbin. Fig. 8 is a side elevation of the spindle-stem and longitudinal section of the spindle-tube, showing a modified construction of means for mounting said tube to tilt. Figs. 9 and 10 are cross-sections taken, respectively, on the line 9 9 of Fig. 6 and the line 10 10 of Fig. 7; and Fig. 11 is a perspective view of the spindle-tube.

Referring now more particularly to the drawings, the numeral 1 represents a chambered shuttle of the ordinary or any ap-

proved construction, and 2 a curved plate-spring mounted upon one end of the shuttle and serving to lock the spindle in its raised and lowered positions.

The spindle comprises in its construction a stem or spindle proper, 3, and a tube sleeve or thimble 4, encircling the same. The stem 3 is provided at one end with a hook or shoulder 5, which holds the bobbin in position thereon, and is reduced or tapered toward each end from a central point to form a bearing portion or fulcrum 6. At its opposite end the spindle is provided with a substantially triangular-shaped head 7 and is pivoted upon a pin 8 to the shuttle, so as to be moved into and out of the chamber in the shuttle. The locking-spring 2 is adapted to bear upon one of the corners of the head 7 to hold the shuttle elevated and lowered, as clearly shown in Figs. 1 and 2.

The tube or sleeve 4 is of such length as to extend between the hook or shoulder 5 and the head 7 and is of such diameter as to adapt the enlarged central portion 6 of the spindle 3 to fit easily yet snugly therein, so as to adapt said portion 6 to serve as a fulcrum on which the tube is adapted to tilt or oscillate. The engaging portion or shoulder 5 in the construction shown in Figs. 1 and 2 projects upwardly from the spindle, so as to be concealed and projected by the vertical tilting movement of the sleeve 4 on the stem of the spindle. A spring 9 is located within the end of the sleeve adjacent to the head 7 and bears at one end upon the spindle-stem 3 and at the other end against the upper surface of the tube 4, so as to force the inner end of the tube upwardly and throw the outer end of the tube downwardly, as shown in Fig. 1, to expose the hook or shoulder 5 to act as a stop to hold the bobbin in position on the cylinder. When the spindle is lowered, this spring exerts its energy to tilt the tube 4 on the fulcrum 6 to throw the outer end of the tube downward, whereby the shoulder or engaging member 5 is caused to project beyond the tube and to hold the bobbin against outward endwise movement thereon. When the spindle is raised, the inner end of the tube 4 comes into contact with the inner end of the locking-spring 2, which forces the said inner end of the tube down against the tension of the

spring 9, and thereby raises the outer end of the tube into alinement with the upper or outer surface of the hook 5, so as to extend flush therewith and permit of the bobbin being removed from the spindle by an outward endwise sliding movement thereon. It will thus be seen that when the bobbin is placed upon the spindle and the latter is lowered or forced down into the shuttle-chamber said bobbin will be automatically locked and that upon the spindle being raised the bobbin will be automatically released and may be readily withdrawn.

In Figs. 3, 4, and 5 the construction is modified by dispensing with the spring 9 and substituting therefor a staple 10, which is driven into the shuttle 1 and is located so that its cross-bar will extend transversely beneath the spindle immediately in advance of the head 7, so as to bear upon the inner end of the tube 4 and force it upwardly to cause the outer end thereof to tilt downwardly on the fulcrum 6, and thereby project the hook 5 to engage the bobbin. When the spindle is elevated, as shown in Fig. 4, the inner end of the tube is pressed downward by the locking-spring 2 to bring the tube into position to cover the shoulder 5 and permit of the bobbin being placed in position on the spindle. Upon the spindle then being forced down into the shuttle-chamber the spring 2 will be disengaged from the tube and the inner end of the tube brought into contact on its under side with the staple 10, which will tilt the tube and project the shoulder 5, and thereby automatically lock the bobbin.

In Figs. 6 and 9 a pin 11 is substituted for the staple 10 and performs the same function.

In Figs. 7 and 10 the hook or shoulder 5 projects laterally, or from one side of the spindle-stem 3, and the tube or sleeve 4 is mounted to tilt sidewise or in a transverse direction with relation to the shuttle 1. To effect the tilting of the tube, a contact-piece 12 is fixed to the wall of the shuttle 1 upon one side of the center thereof, and the tube 4 is adapted to come in contact therewith when the spindle is lowered. The lowering of the spindle thereby causes the inner end of the tube to be moved transversely in one direction and the outer end of the tube to be moved in the reverse direction to project the hook or shoulder 5 to lock the shuttle. When the spindle is raised, the tube is withdrawn from engagement with the contact-piece 12 and is left free to tilt, and the pressure of the fingers on the bobbin is utilized to move the outer end of the tube in the reverse direction to bring it flush with the outer surface of the hook or shoulder 5 to permit of the bobbin being removed. The locking-spring 2 may or may not be used in the construction shown in Figs. 1 to 6, inclusive, and Fig. 9 to tilt the tube to release the bobbin, as this operation may be carried out by either providing an auxiliary contact or tripping device in lieu thereof or by pressing with the fingers in the proper direction when

the spindle is being raised to tilt the tube, so as to bring the outer end thereof flush with the outer surface of the hook or shoulder to enable the bobbin to be released.

Instead of tapering or otherwise forming the stem 3 to provide the fulcrum point or shoulder 6 I may flare or taper the inner wall of the tube to form a fulcrum-point 6', on which the tube is adapted to tilt. Instead of flaring or tapering the stem or tube to provide a fulcrum-point such a point may be formed by providing said stem with a collar or the tube with an annular flange centrally disposed upon them, as will be readily understood.

From the foregoing description, taken in connection with the accompanying drawings, the construction, mode of operation, and advantages of the invention will be readily understood. It will be seen that the invention provides a spindle which securely holds the bobbin in position when in the shuttle and releases the same when withdrawn therefrom, such operation being performed automatically by depressing the spindle within the shuttle-chamber and elevating the spindle to withdraw it therefrom.

Variations in the form, proportion, and the minor details of construction may be resorted to within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A spindle having a central fulcrum-point formed with a hook or engaging member at one end, a tube or sleeve mounted to oscillate upon said spindle, and a spring for tilting said tube or sleeve in one direction, substantially as described.

2. A shuttle-spindle having an engaging portion at one end and a central fulcrum-point, a tube or sleeve fitted upon the spindle to tilt or oscillate, and means for automatically tilting the sleeve to project the hook or shoulder when the spindle is applied to the shuttle and to restore the tube to its normal position to permit of the bobbin being removed when the spindle is removed from the shuttle, substantially as described.

3. A shuttle-spindle reduced or tapered at a central point to form a fulcrum point or bearing and having an engaging member at one end, a tube or sleeve inclosing said spindle and mounted to tilt upon said fulcrum-point, and a spring located within the tube and bearing at one end upon the tube and at its other end upon the spindle and serving to normally hold the tube tilted to expose the said engaging member, substantially as described.

4. The combination with a shuttle, of a spindle pivoted therein and comprising a stem and a tube or sleeve encircling the same, said stem being provided at its free end with a hook or engaging member and the tube being mount-

ed to tilt upon the stem to expose and conceal the engaging portion of said member, and means for automatically tilting the sleeve to expose the hook to lock the bobbin when the spindle is forced down into the shuttle, substantially as described.

5 5. The combination with a shuttle, of a spindle pivoted thereto, said spindle consisting of a stem provided at one end with a hook or engaging member and a tube mounted to tilt upon said stem, a spring upon the shuttle for holding the stem in raised and lowered positions and for tilting the tube to conceal the engaging portion of the hook to permit of the bobbin being released, and means for tilting the tube in the reverse direction to lock the bobbin when the stem is forced down into the shuttle, substantially as described.

20 6. The combination with a shuttle, of a spindle pivoted therein and comprising a stem and

a tube or sleeve encircling the same, said stem being provided at its free end with a hook or engaging member and the tube being mounted to tilt upon the stem to expose and conceal the engaging portion of said member, means for automatically tilting the sleeve to expose the hook to lock the bobbin when the spindle is forced down into the shuttle, and further means for tilting the sleeve to restore said sleeve to its normal position to permit of the bobbin being removed when the spindle is elevated from the shuttle, substantially as described.

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

AMARIAH AVERY.

Witnesses:

ROBERT L. MANNING,
GEO. H. WARREN.