

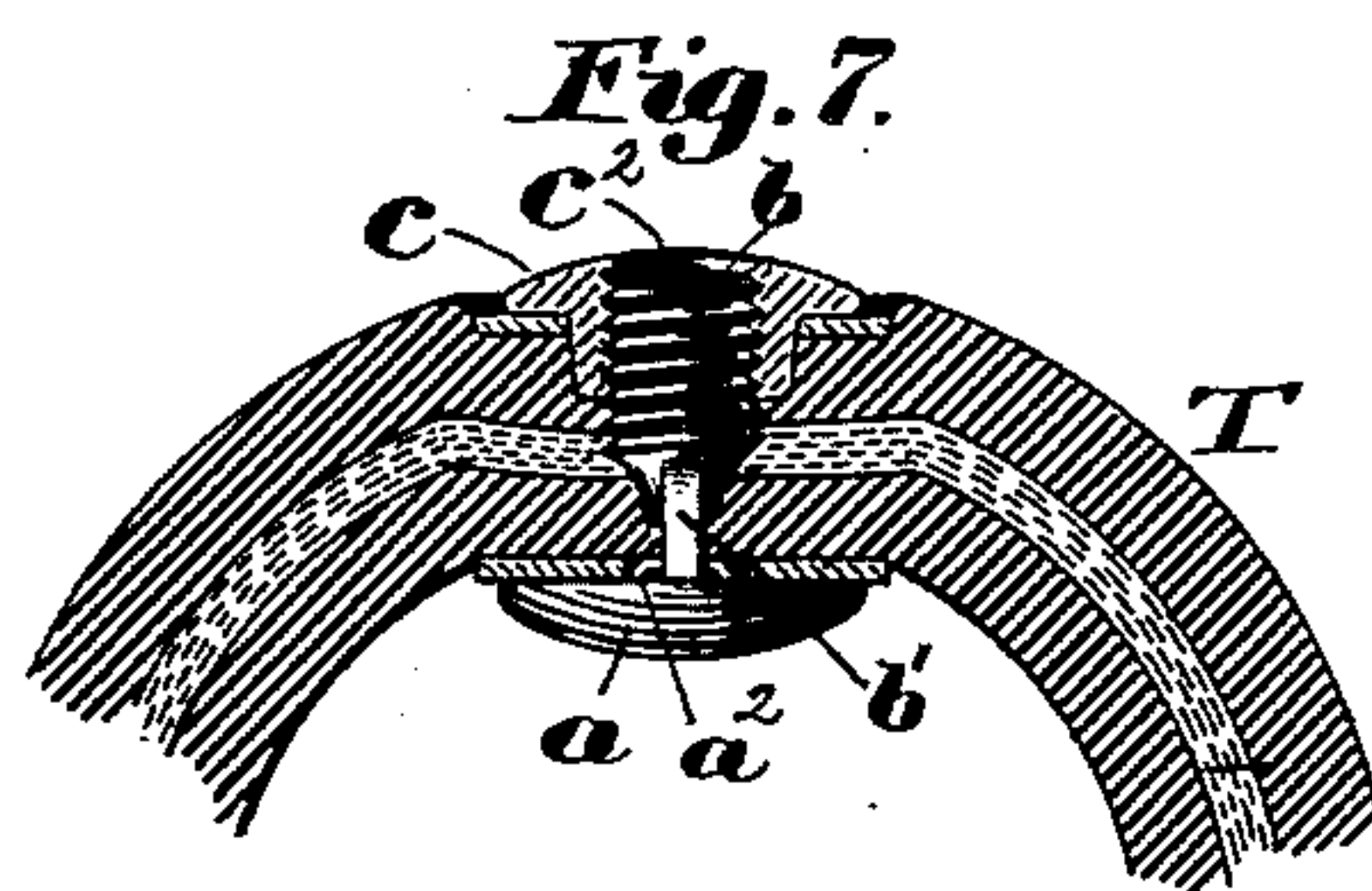
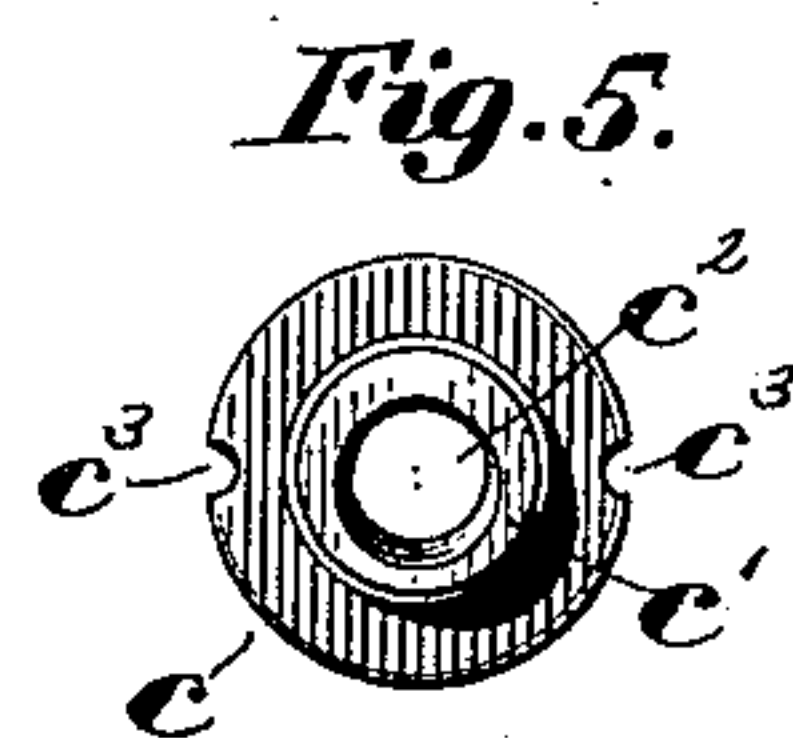
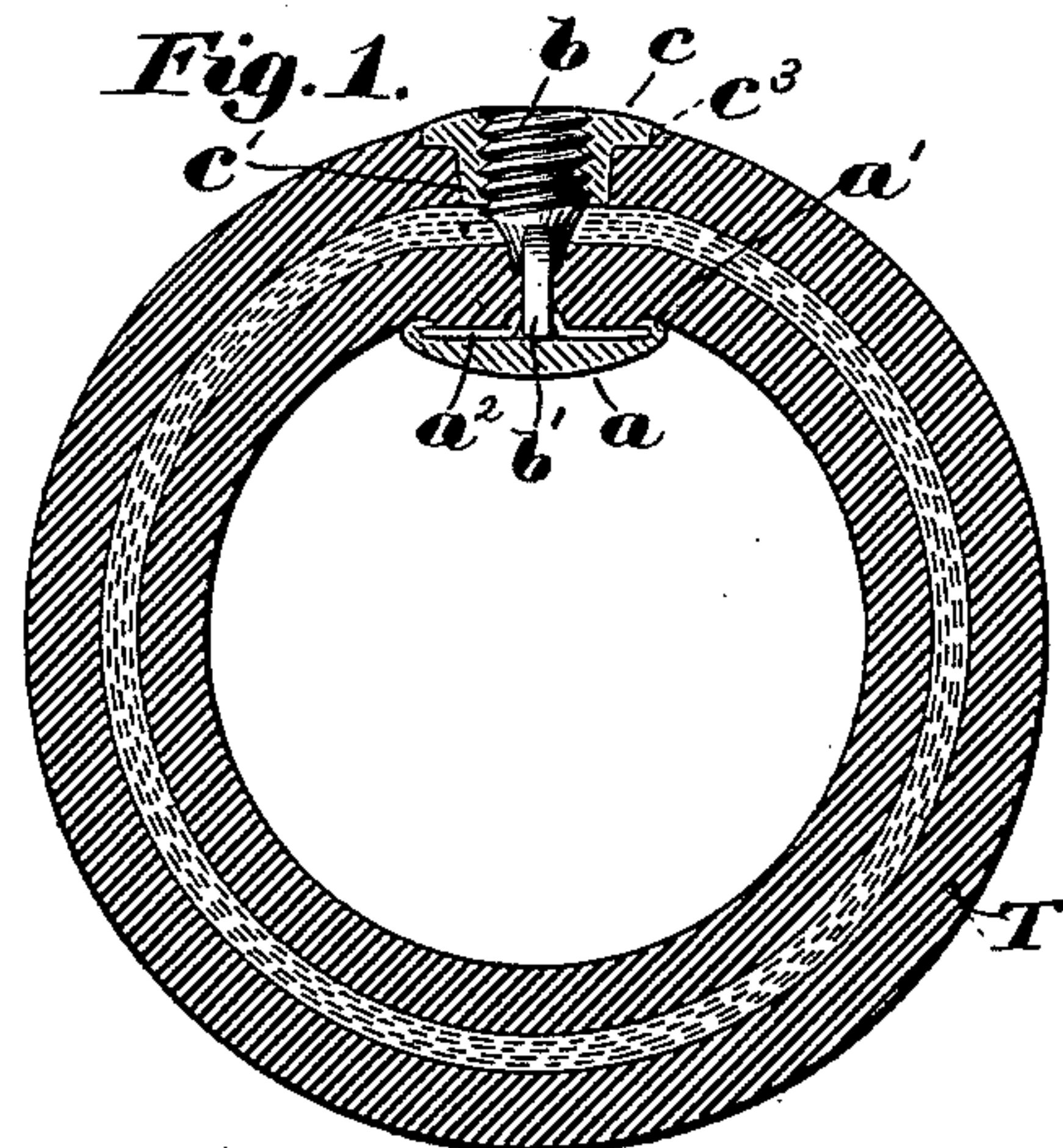
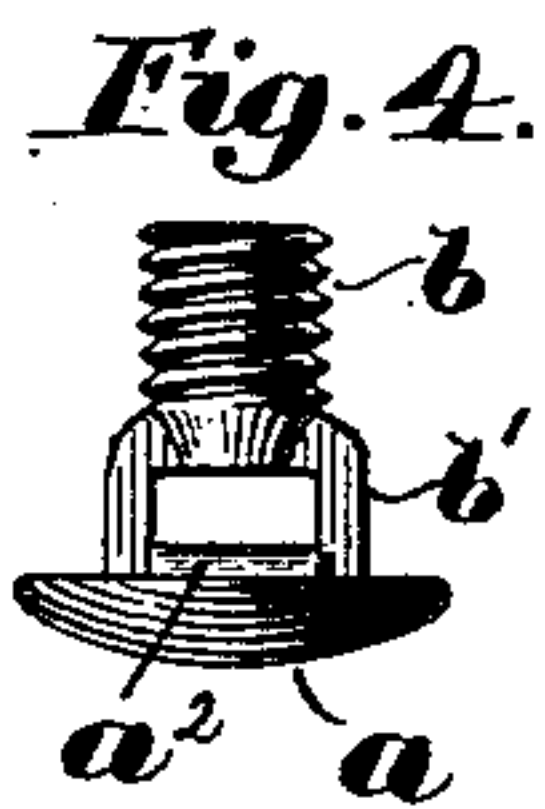
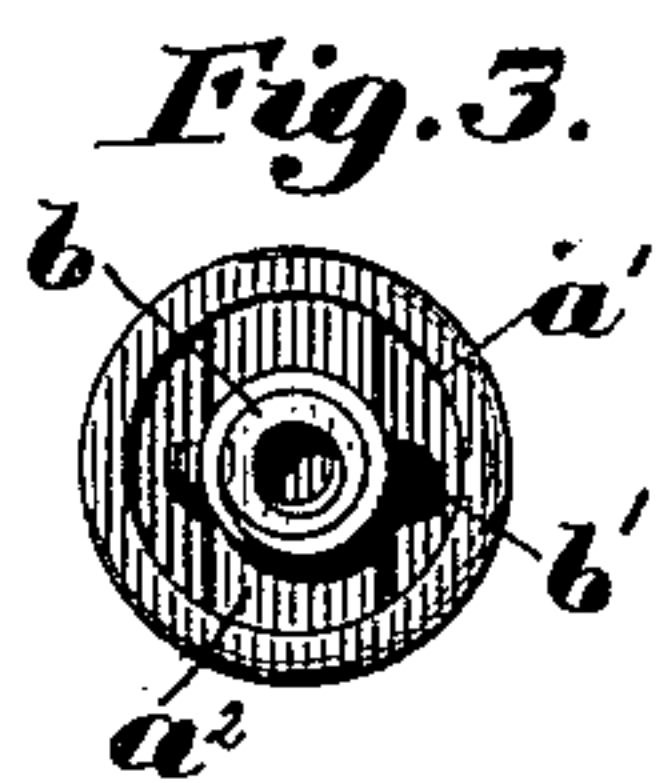
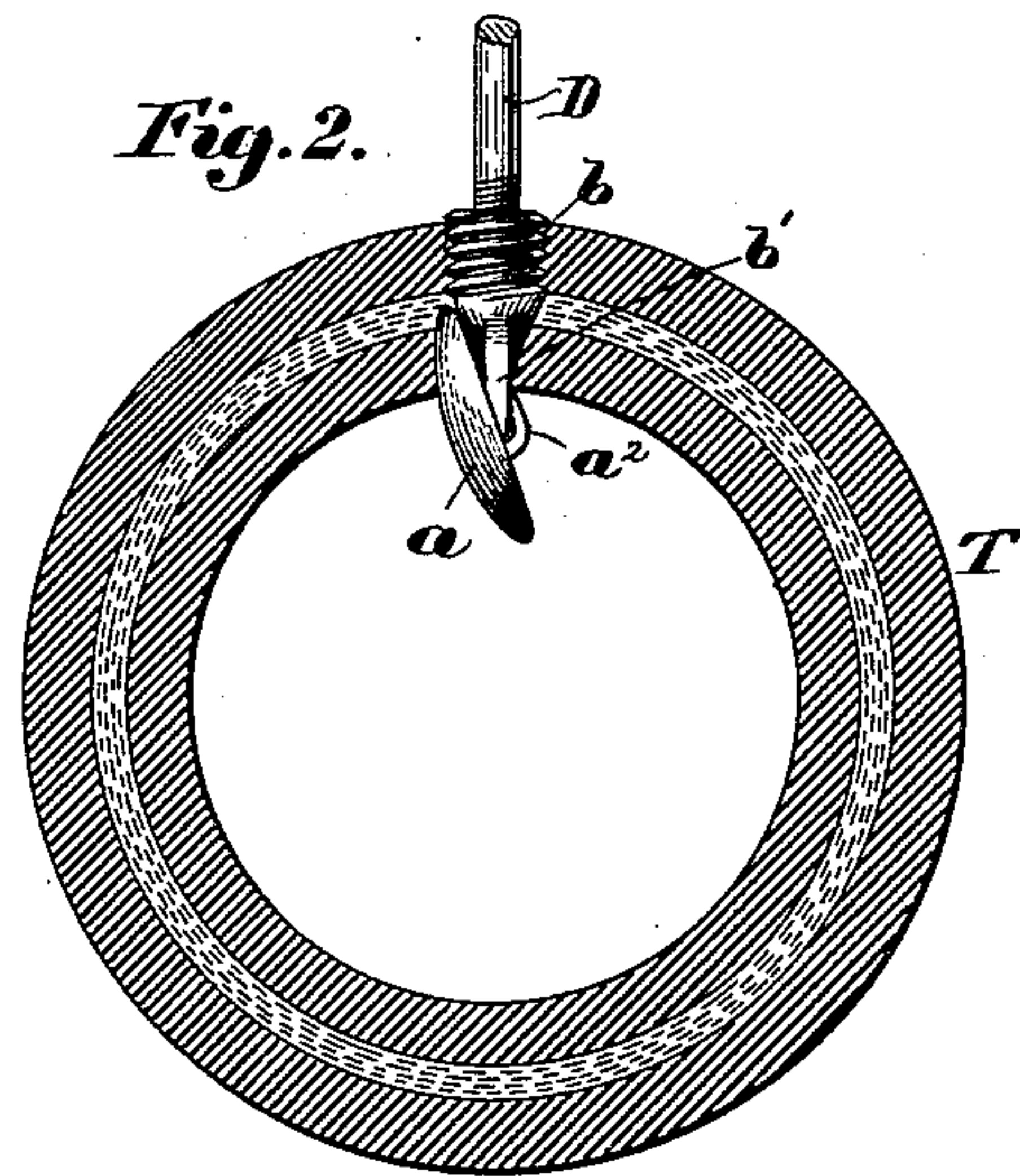
(No Model.)

G. F. GLIDDEN.

DEVICE FOR CLOSING PUNCTURES IN PNEUMATIC TIRES.

No. 602,743.

Patented Apr. 19, 1898.



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE F. GLIDDEN, OF WATERTOWN, MASSACHUSETTS.

DEVICE FOR CLOSING PUNCTURES IN PNEUMATIC TIRES.

SPECIFICATION forming part of Letters Patent No. 602,743, dated April 19, 1898.

Application filed February 7, 1898. Serial No. 669,384. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. GLIDDEN, of Watertown, county of Middlesex, State of Massachusetts, have invented an Improvement in Devices for Closing Punctures in Pneumatic Tires, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates to devices for effectually closing punctures and holes in pneumatic tires, hose, or tubing; and it has for its object the production of a simple, strong, and efficient puncture-closing device adapted
15 to be readily and accurately applied, my invention being particularly adapted for closing holes and punctures in pneumatic vehicle-tires.

Rubber and other flexible plugs have been
20 devised for closing punctures with the aid of cement, but such plugs are difficult to apply, and owing to their flexibility they frequently are so bent or folded as to render it practically impossible to at times effect a perfect
25 closure. So, too, conical-headed plugs have been devised provided with a threaded shank to receive a cap, the material of the tire or tubing being held between the base of the cone and the cap, but such devices tend to
30 greatly enlarge the puncture, and the yielding material of the tubing will not fit tightly around the base of the plug, so that a tight closure cannot be effected.

By my present invention I obviate the objectionable features of the flexible or metallic
35 plugs referred to, and without the use of cement I am enabled to effect a tight and effective closure of a hole or puncture without unduly increasing the size of the hole.

40 Figure 1, in cross-section and enlarged, represents a portion of tubing with my novel puncture-closer applied thereto. Fig. 2 is a like view showing the manner of inserting the device into the puncture. Figs. 3 and 4
45 are enlarged views in plan and elevation of the plug. Figs. 5 and 6 are under side and side elevation views of the cooperating retaining-cap, and Fig. 7 is a sectional detail showing my puncture-closing device in use
50 with washers.

My novel puncture-closing device comprises, essentially, a head *a*, preferably made

of brass or other rigid material, a threaded shank *b*, to which the head is pivotally connected, and a detachable cap *c*, adapted to be
55 applied to the shank and to rest against the interior of the tire or other tube.

I have shown the head *a* as exteriorly convexed and interiorly concaved to leave a peripheral rim or bead *a'*, which also serves to
60 retain in place a transverse and preferably spring plate *a²*, Figs. 1 and 3, arched at its center to receive the yoke-like end *b'* of the hollow shank *b*, the latter being both interiorly and exteriorly screw-threaded. The head
65 and shank are thus pivotally connected, and the spring-plate *a²* tends to retain the head either at right angles to the shank or swung up against it, as in Fig. 2.

The cap *c* is shown as convexed upon its
70 outer surface and having on its inner face a projecting interiorly-threaded hub *c'*, the opening *c²* thereof extending through the cap, the latter having oppositely-located peripheral notches *c³*, Fig. 5, and preferably the hub
75 *c'* is made slightly conical.

In order to apply the closing device to a punctured tire or other tube *T*, a threaded rod *D*, Fig. 2, is screwed into the shank *b*, and the head *a* having been turned up against
80 the shank it is forced edgewise through the hole or puncture into the interior of the tube. When the head *a* is entirely within it, it can be readily turned on its pivot into position at right angles to the shank and by means of
85 the rod *D* drawn up close against the inner surface of the tube, as in Fig. 1, with the shank in the hole or puncture. The cap *c* is then slid over the rod *D* down to the outer end of the shank, and the threaded hub *c'* is
90 firmly screwed onto the shank, the hub forcing itself into the puncture, as shown in Fig. 1, and adjusting itself to the thickness of the tube *T*. A suitable wrench having prongs to enter the notches *c³* is employed to screw the
95 cap into position, the yielding material of the tube *T* around the hole therein being tightly compressed between the head *a* and the cap, the material being forced into the concave back of the head, as shown in Fig.
100 1, to effectually and hermetically close the hole. The notches *c³* of the cap will be entered by the tube material, thus preventing retrograde rotation of the cap, and after the

cap has a firm hold upon the shank *b* the rod *D* can be unscrewed from the shank.

I have shown the size of the closing device as greatly exaggerated to more clearly illustrate the construction thereof, and obviously the head may be made round, oval, or otherwise to adapt it to different kinds of punctures.

No cement is necessary with my device, nor is it necessary to singe or burn the edges of the hole or puncture in order to effect a tight closure, as is required with rubber plugs.

In Fig. 7 I have shown washers *w* and *w'* interposed between the inner faces of the head and cap, the washers being used, if desired, to still further close the hole or puncture.

By my invention the plug is securely and positively held at the interior and exterior of the tube, compressing the material thereof around the hole and pushing it into intimate contact with the shank and hub of the cap.

My invention is not restricted to the spring-plate *a*², for the head and shank can be loosely hinged or pivoted together, if desired; and I am not restricted to the precise construction and arrangement shown, as the same may be modified and rearranged without departing from the spirit and scope of my invention.

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

1. A puncture-closer for tubing, comprising a shank, a head hinged thereon, and a cooperating retaining-cap, substantially as described.

2. A puncture-closer for tubing, comprising a threaded shank, a head hinged thereon and having a concave back, and a retaining-cap threaded to engage the shank, substantially as described.

3. A puncture-closer for tubing, comprising a shank, a head, and a spring-hinge connecting the shank and head, substantially as described.

4. A puncture-closer for tubing, comprising a shank, a head hinged thereon, and a cooperating retaining-cap constructed and arranged to be engaged and held by the material of the tube, substantially as described.

5. A puncture-closer for tubing, comprising a threaded shank to extend through the material of the tube, a thin, substantially concavo-convex head hinged to the inner end of the shank, and a retaining-cap adapted to be screwed onto the shank, to clamp the tube between the head and cap, substantially as described.

6. A puncture-closer for tubing, comprising a head having a concave back, a threaded shank hinged to said head, and a cooperating retaining-cap having a tapered hub on its inner face, interiorly threaded to engage the shank, the head adjusting itself on the inner surface of the tube relatively to the shank, the latter extending through the hole or puncture, substantially as described.

7. In a puncture-closer for tubing, a threaded shank having a forked inner end, a head hinged to said forked end, said head having a slightly-convexed face and rounded periphery, and a retaining-cap to engage the shank and peripherally notched, as and for the purpose described.

8. In a puncture-closer for tubing, a shank, a spring-controlled head hinged thereto, and means to retain said shank and head in place in the tubing, substantially as described.

9. In a puncture-closer for tubing, a shank threaded interiorly and exteriorly, a head hinged to the inner end of the shank, and a retaining-cap having an internally-threaded hole to engage the shank, the interior thread of the shank being adapted to be engaged by a holder when inserting the head in the tube, substantially as described.

10. A puncture-closer for tubing, comprising a metallic head, a threaded metal shank with which it is pivotally connected, whereby the head can be turned up against the shank, and a cap adapted to be screwed onto the shank and bear against the exterior of the tube, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE F. GLIDDEN.

Witnesses:

WM. L. TYLER,
C. A. FERGUSON.