

No. 682,401.

Patented Sept. 10, 1901.

G. W. BOLTON, JR.
REPAIR TOOL.

(Application filed Feb. 12, 1901.)

(No Model.)

Fig. 1.

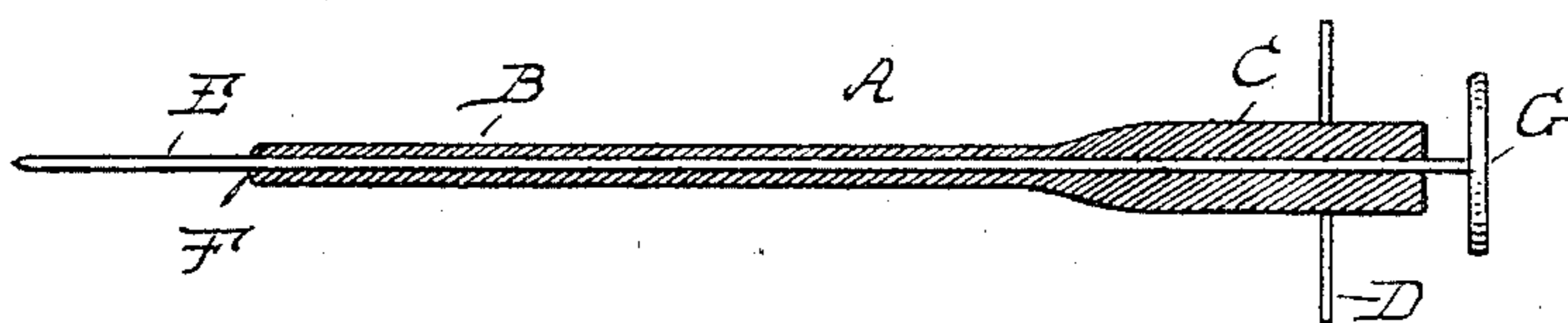


Fig. 2.

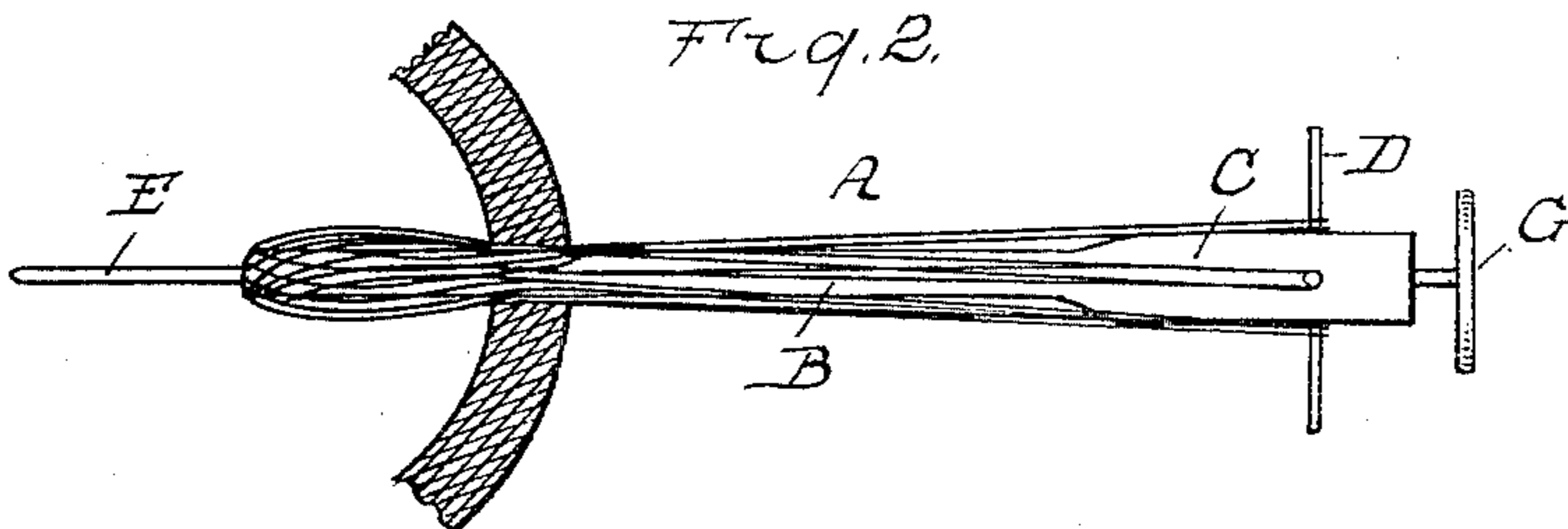


Fig. 3.

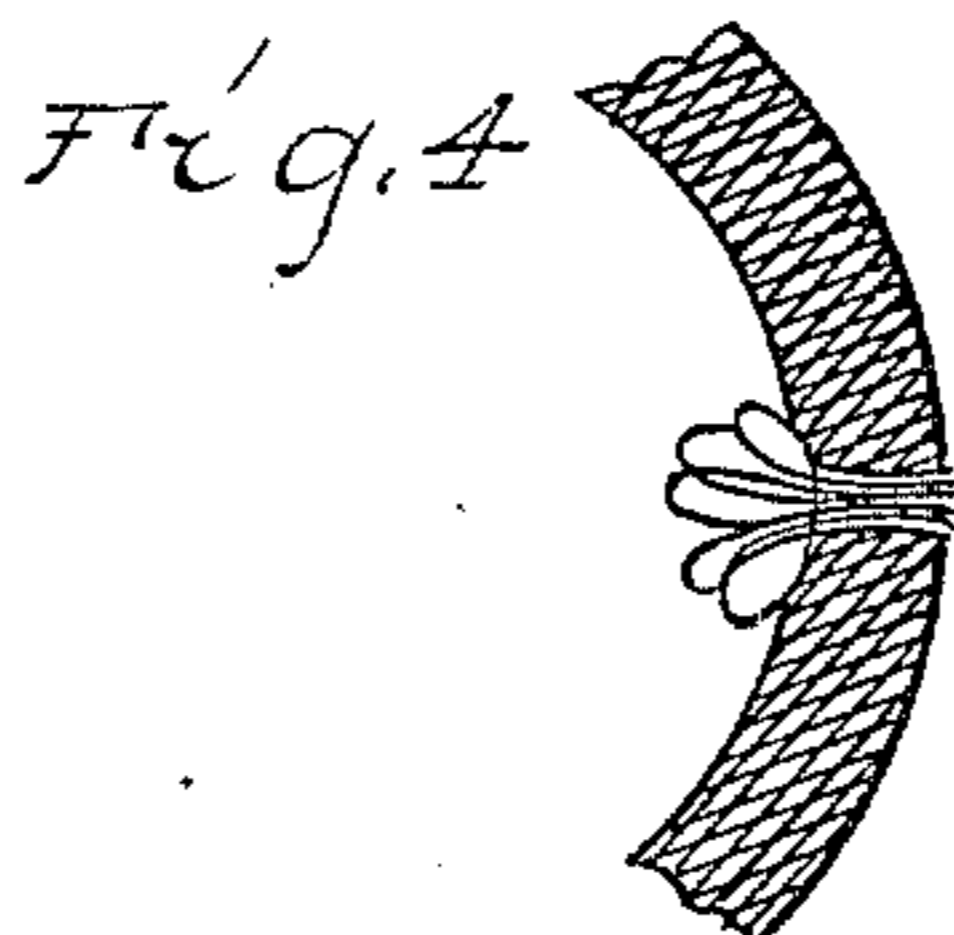
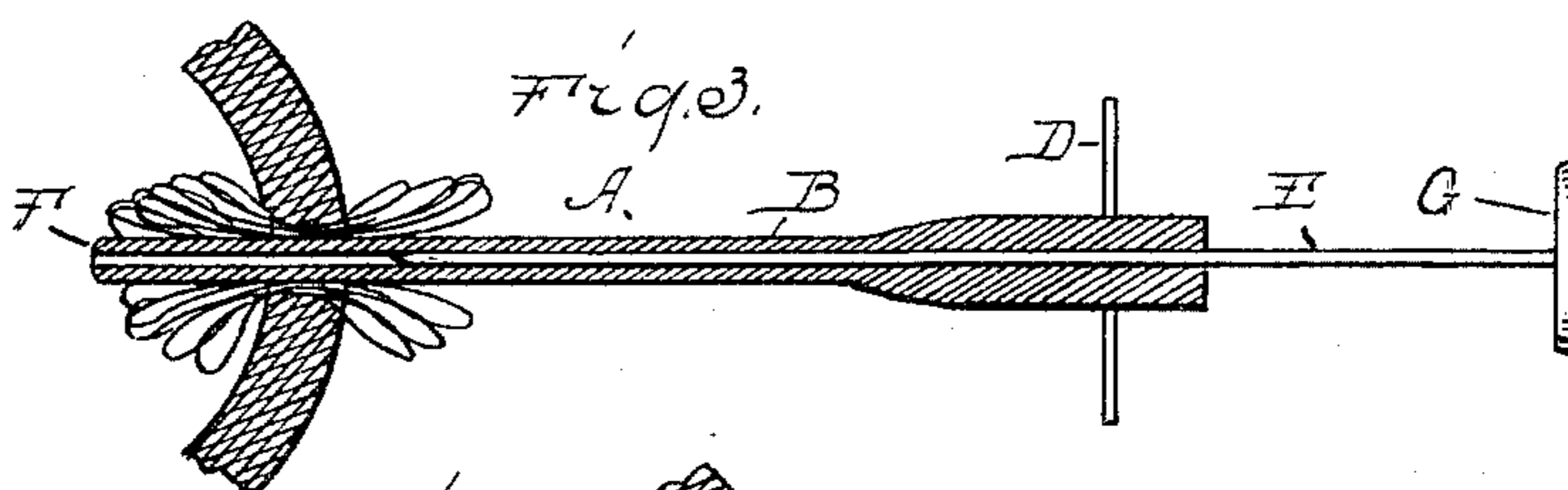
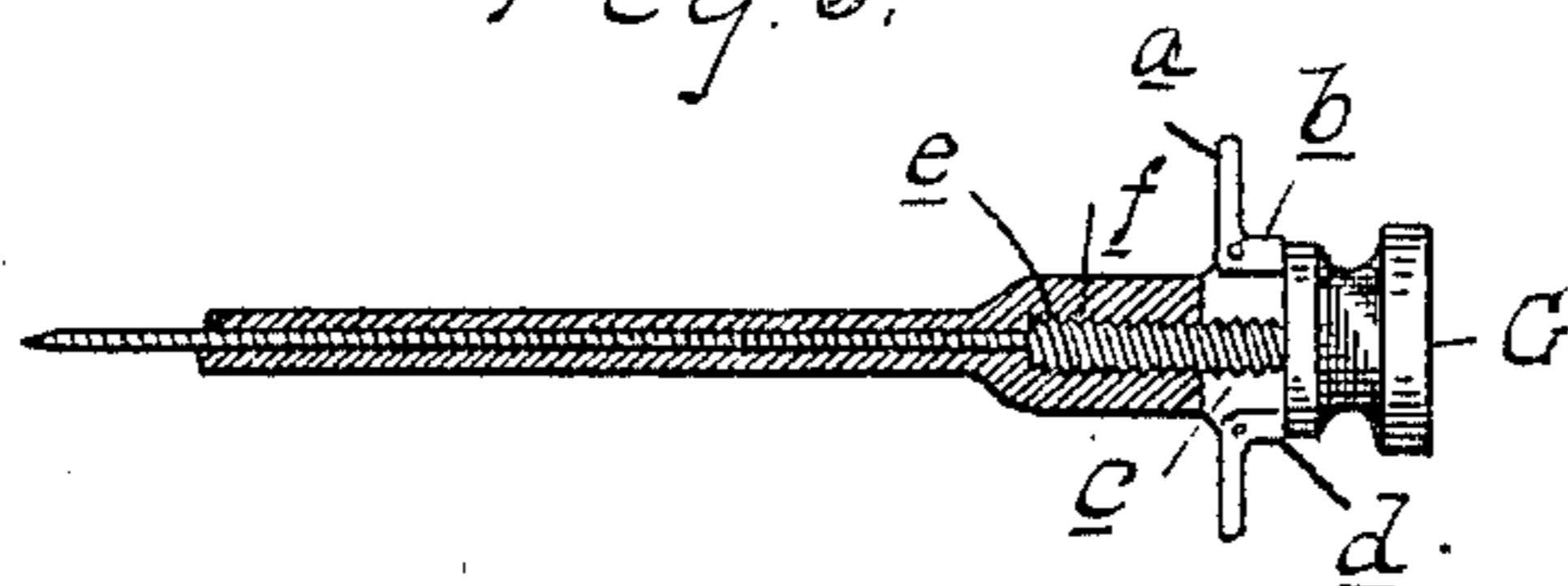


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

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REPAIR-TOOL.

SPECIFICATION forming part of Letters Patent No. 682,401, dated September 10, 1901.

Application filed February 12, 1901; Serial No. 46,959. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BOLTON, Jr., a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Repair-Tools, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention has reference generally to a puncture-repair tool for closing incisions or punctures in elastic tubing—such as bicycle-tires, hose, &c.—and relates particularly to that type of tool wherein the plugging or filling of the puncture is effected by the insertion through the tire-opening of one or more strips or bands, preferably of elastic material.

The invention consists in the novel construction of a repair-tool of the character set forth and in the peculiar arrangement and combination of its various parts, whereby the bands or strips carried by the tool may be entirely and quickly disengaged from the latter prior to the withdrawal of the tool from the tube or even before the initial movement of withdrawal is effected.

In the drawings illustrating my invention, Figure 1 is a vertical central section through the repair-tool. Fig. 2 is an elevation of the tool in readiness for use, showing the same inserted through a puncture-opening in a bicycle-tire. Fig. 3 is a vertical central section through the tool, illustrating the latter as in readiness to be withdrawn from the tubing. Fig. 4 is a sectional view of a portion of the tire, showing the finished plug therein; and Fig. 5 illustrates a modified construction of tool.

The reference-letter A designates the tool, which, as shown, has one end, which will hereinafter be termed the "inner" end, shaped for insertion through the puncture-opening in the tire. The inner end described is provided with band-retaining means, which holds the strips or bands, and is further provided with releasing means, hereinafter described, whereby the bands or strips may be immediately and entirely disengaged from the inner tool end to permit of the ready withdrawal of the tool from the tube.

One form of construction for the tool is as shown in Fig. 1, wherein the tool is composed

of two complementary members having a sliding engagement one with the other. One of the members is preferably tubular in form, (designated by the reference-letter B,) the inner end of which is shaped as illustrated to permit of its insertion through the puncture-opening in the tire to be repaired, while at the opposite end it is slightly enlarged, as at C, and carries thereon band-retaining devices, preferably in the form of pins D. The inner tool member is in the form of a stem E, which slides within the outer member and projects beyond the inner end of the latter, forming, in connection with the tubular member, a shoulder F, which constitutes the band-retaining means at the inner end of the tool. At its opposite end the stem is provided with a head G, by means of which the stem may be partially or entirely withdrawn from the outer member to permit of the disengagement of the bands from the tool being effected.

In operation a plurality of strips, preferably rubber bands, are secured at their inner ends against the shoulder F in the manner shown in Fig. 2 and at their opposite ends to the pins D, the stem being extended through the tubular member to form the retaining-shoulder. The tool carrying the bands thereon is preferably dipped in a liquid cement and then inserted through the puncture-opening in the tire or tube that is to be repaired, as indicated in Fig. 2. Upon the partial withdrawal of the stem the ends of the bands or strips within the tube are immediately and entirely disengaged from the inner tool end and subsequently the outer ends of the bands are detached from the pins. The tool being thus entirely freed from the bands at both ends can be readily withdrawn from the puncture without any liability of the bands sticking to the tool and being withdrawn by the latter from the opening. Upon the withdrawal of the tool the bands are allowed to expand, thus entirely filling the opening, and the ends of the bands projecting beyond the exterior of the tire may be clipped off, as indicated in Fig. 4.

In Fig. 5 I have shown the retaining means for the outer band ends of such construction that the bands may be automatically released. The means employed consist of fingers or pins a, pivoted between brackets b upon an en-

larged portion *c* at the outer tool end. Each pin, as shown, is provided with a bearing *d*, against which the head *G* is adapted to bear for the purpose of maintaining the pins in their extended position. In this construction it is necessary that means should be provided for preventing independent longitudinal movement of the parts while the bands are being stretched upon the tool, and I have therefore provided a lock for this purpose, consisting of a thread *e*, formed upon an enlargement at the outer end of the stem, and an internal thread *f* upon the interior of the enlargement *C* of the tubular member, with which the thread *e* engages. In the modification the bands are attached to the tool in the manner before described; but the outer band ends are released first and automatically upon unscrewing the stem from the outer member.

While I have shown and described different types of the tool, I do not desire to be limited to the constructions set forth, as it is obvious from the modification that various changes could be effected without in any manner departing from the spirit of my invention, which consists, essentially, of a tool shaped to be inserted within the puncture-opening in the tube, of band-retaining means upon the inner tool end, and mechanism for entirely disengaging the bands from said tool end while the latter is within the tube.

What I claim as my invention is—

1. A puncture-repair tool having its inner end shaped for insertion through a puncture-opening in the tube, means at said inner end for retaining strips or bands of material, and disengaging means at the inner tool end for freeing the latter from the bands or strips after the insertion of the tool within the tube and prior to its withdrawal therefrom.

2. A puncture-repair tool comprising two complementary members shaped for insertion through the puncture-opening in the tube,

said members having sliding engagement one with the other and one of said members at its inner end projecting normally beyond the corresponding end of its complementary member, forming in connection with the latter a strip or band retaining shoulder and strip-retaining means upon one of the members arranged at a distance from said shoulder.

3. A puncture-repair tool comprising an outer member shaped for insertion through a puncture-opening in the tube and having an enlargement formed upon its opposite end, a plurality of pins pivotally connected to the enlargement and adapted to extend at substantially right angles therefrom, bearings formed upon the pivot ends of the pins, a stem arranged within the tubular member and projecting normally beyond the inner end of the latter, said stem having a thread formed upon its outer end adapted to engage a thread upon the interior of the enlargement, and a head upon the outer stem end constructed to engage the bearings upon the pins and maintain the latter in their extended positions.

4. A puncture-repair tool having its inner end shaped for insertion through the puncture-opening, means at said inner tool end for retaining a strip or strips of elastic material, similar means upon said tool at a distance from the inner end thereof, a strip-releasing mechanism for disengaging the strips from the inner tool end after the insertion of the latter within the tube, and means for automatically disengaging the strips from the band-retaining means at the opposite end of said tool.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. BOLTON, JR.

Witnesses:

L. J. WHITEMORE,
H. C. SMITH.