

(No Model.)

M. CAHN.

DEVICE FOR REMOVING BROKEN SCREWS, &c.

No. 410,780.

Patented Sept. 10, 1889.

Fig. 1.

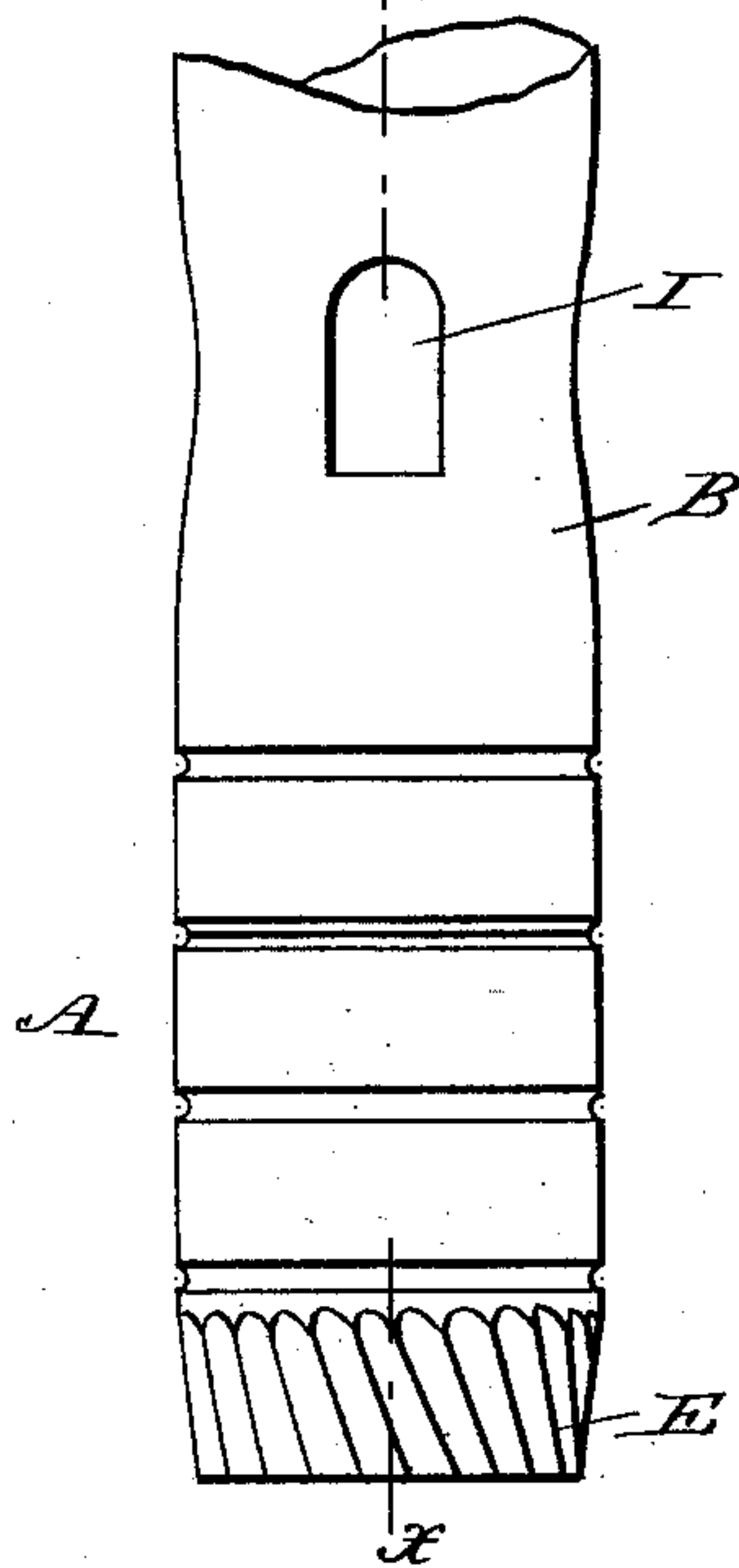


Fig. 2.

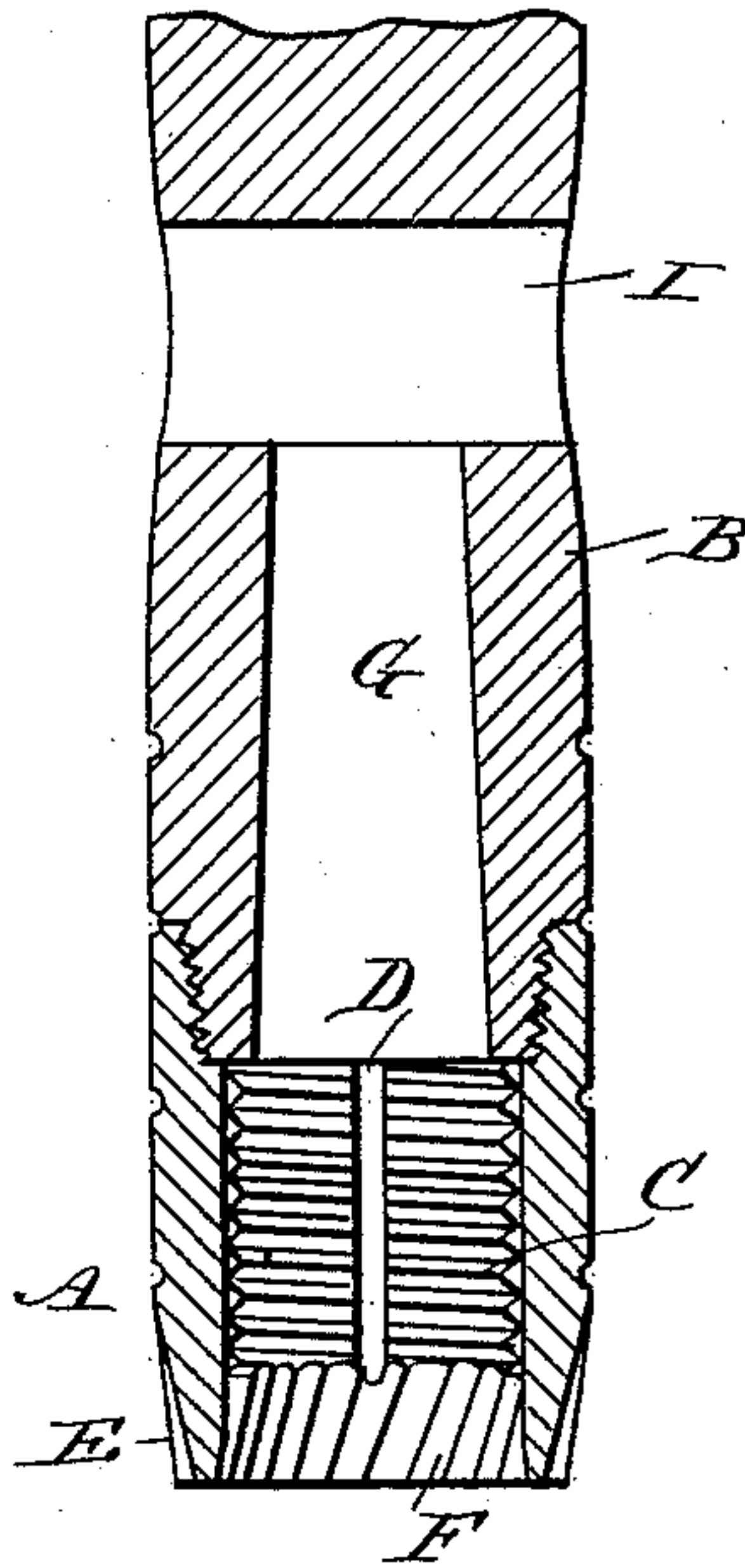


Fig. 3.

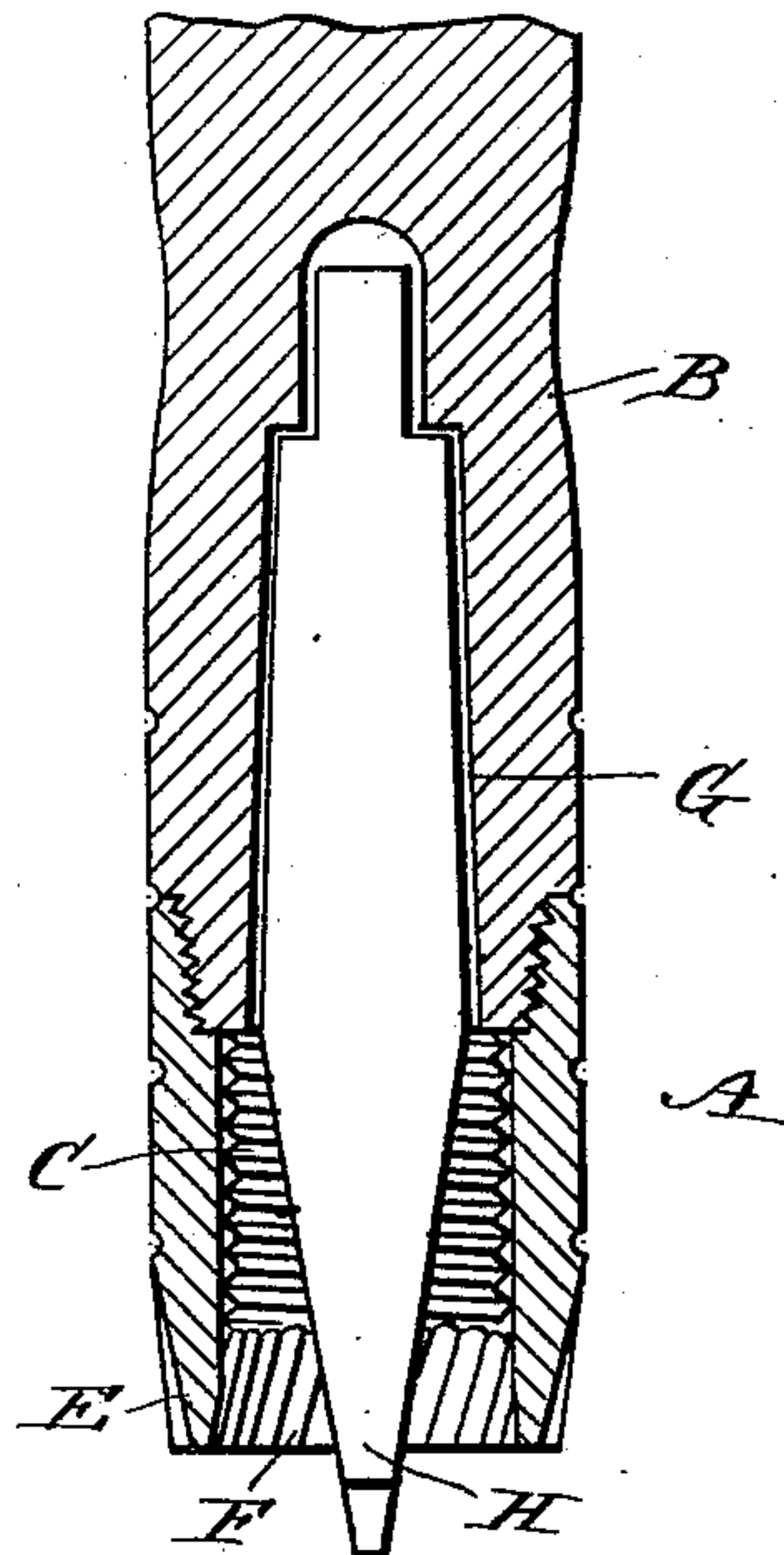


Fig. 5.

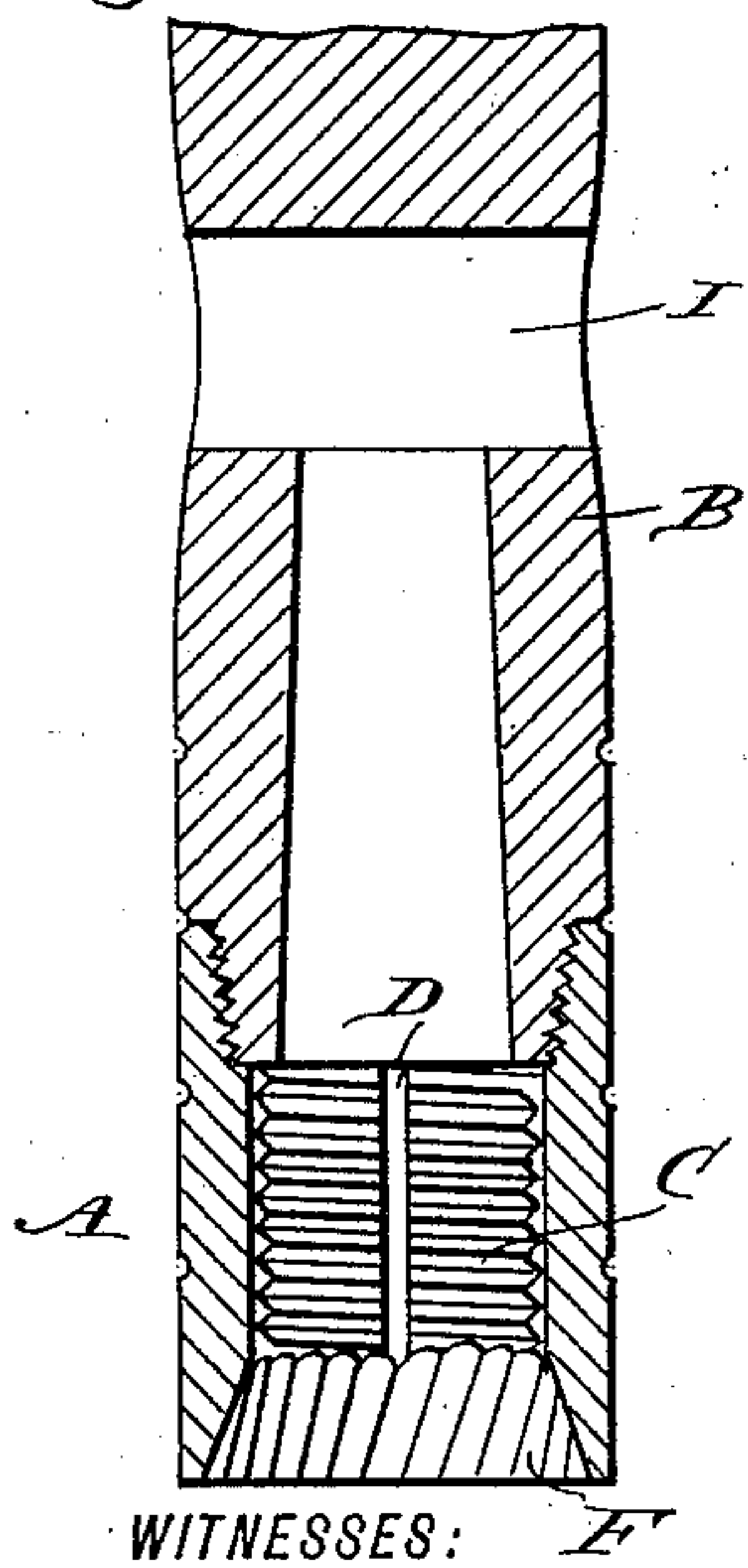


Fig. 4.

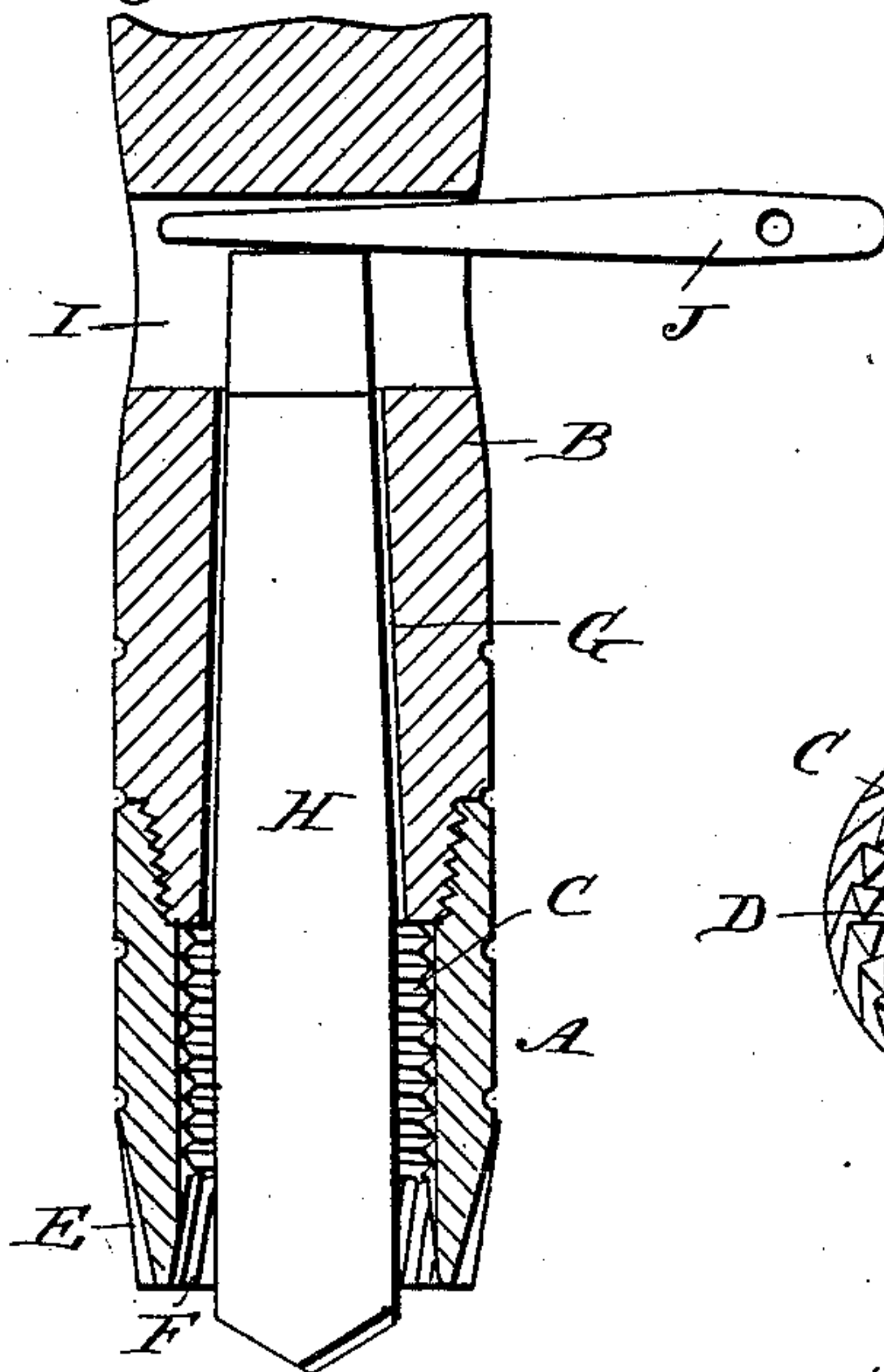
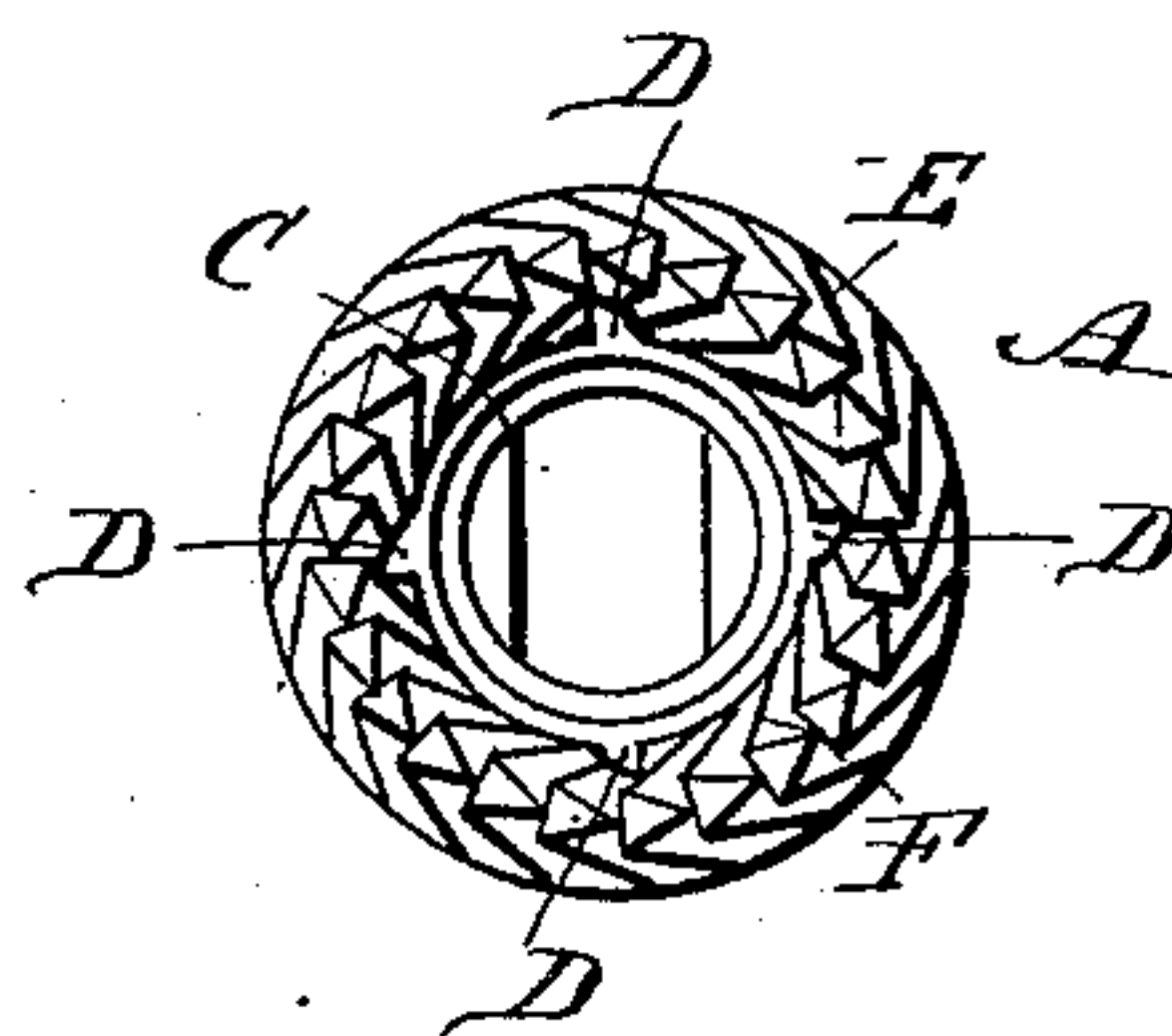


Fig. 6.



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UNITED STATES PATENT OFFICE.

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DEVICE FOR REMOVING BROKEN SCREWS, &c.

SPECIFICATION forming part of Letters Patent No. 410,780, dated September 10, 1889.

Application filed May 28, 1889. Serial No. 312,426. (No model.)

To all whom it may concern:

Be it known that I, MAURICE CAHN, of Weatherford, in the county of Parker and State of Texas, have invented a new and Improved Bit, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved bit specially designed for extracting screws, taps, screw-bolts, &c., from iron, marble, or other hard substances in case one of the said articles is broken off in the material into which it is screwed.

The invention consists of a bit provided with an internal spiral cutting-thread and external cutters.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a transverse section of the same on the line $x x$ of Fig. 1. Fig. 3 is a like view of the same provided with a central drill and adapted for removing objects broken near the surface of the material. Fig. 4 is a transverse section of the same. Fig. 5 is a sectional side elevation of a modified form of the improvement, and Fig. 6 is an inverted plan view of the bit.

The improved bit A is formed of a hollow cylinder screwed or otherwise secured at one end to a shank B of suitable length and shape and adapted to be turned by suitable means. The bit A is provided with an internal spiral cutting-thread C, across which extends a number of grooves D, running lengthwise parallel to the axis of the cylinder, as is plainly shown in Figs. 2 and 5. On the lower end of the bit A, and on the outside, are formed the obliquely-extending cutters E, slightly beveled, as shown in the drawings. Similar cutters F are formed internally of the cylinder A, near its lower end, the inner ends of the said cutters terminating at the beginning of the internal screw-thread C. The cutting-thread C and the cutters E and F are preferably arranged left-handed—that is, in an opposite

direction to the screws, taps, screw-bolts, &c., to be operated on. In case the latter are left-handed said thread C and the cutters E and F are right-handed. The bit A is held removably on the shank B, so as to fasten a bit of any desired size on the said shank. The size of the bit A is measured according to the internal cutting-thread C, which has a diameter corresponding to the diameter of the screw, tap, or screw-bolt to be removed.

The device is used as follows: When a screw, tap, or screw-bolt is broken off in a piece of iron, marble, or other material, the operator selects a bit A, of which the diameter of the internal thread C corresponds to the diameter of the broken-off object. The bit A is fastened on the shank B, and the latter, by suitable means—such as a ratchet-drill, wrench, or other device—is turned, the end of the bit being inserted in the aperture in which the object is broken off. By turning the shank B the oblique external cutters E remove part of the material, so that the bit A enters the opening leading to the broken-off object. When the end of the bit A comes in contact with the broken-off object, the internal cutters F cut off part of the thread on the said screw, tap, or screw-bolt, and the cutting-thread C cuts a new thread on the object, said new thread extending in an opposite direction to the old thread. When the bit has cut a sufficient length of thread on the broken-off screw, tap, or screw-bolt, the latter will finally turn with the bit—that is, in the opposite direction to that in which its old thread was formed, whereby the broken-off object is screwed out of its aperture, and is conveniently removed from the material, and finally from the bit A. The cuttings of the internal thread F pass through grooves D, and in a similar manner the cuttings of the thread C pass through the said grooves.

When the screw, tap, screw-bolt, &c., is broken near the surface of the material, the operator employs an ordinary drill H, fitted into a socket G in the lower end of the shank B. The cutting-edge of the drill H extends a short distance below the outer end of the bit A, so that the operator in first drilling causes the drill H to bore an aperture in the center of the screw, tap, screw-bolt, &c., to be re-

moved until the cutters E cut into the material surrounding the respective object to be removed. As soon as the bit A has a hold in the material, the operator removes the drill H by inserting the wedge J through a transverse opening I, formed in the shank B, said wedge J pressing against the back of the drill H. (See Fig. 4.) The above-described operation is then repeated.

When the operator desires to probe for a broken-off tap, screw, screw-bolt, &c., he uses a bit A without the external cutters E, as shown in Fig. 1. The cutters E are left off, so that the thread already cut in the material will not be spoiled.

It will be seen that a very simple device is provided for conveniently and quickly removing screws, taps, screw-bolts, &c., broken off in the hard material. As any-sized bit A may be employed, the device ranges from the smallest screws and taps to very large ones. The device is equally useful for a watch-maker and for Artesian-well borers.

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

1. A bit for extracting broken screws, &c., provided with an internal spiral cutting-thread and external cutters, substantially as shown and described.

2. A bit for extracting broken screws, &c., comprising a hollow cylinder having an internal spiral cutting-thread, and oblique cutters formed externally on one end of the said cylinder, substantially as shown and described.

3. A bit for extracting broken screws, &c., comprising a hollow cylinder having an internal spiral cutting-thread, oblique cutters formed externally on one end of the said cylinder, and beveled oblique cutters formed internally on one end of the said cylinder, substantially as shown and described.

4. A bit for extracting broken screws, &c., formed of a hollow cylinder having an internal spiral cutting-thread, and grooves formed across the ridges of said thread, substantially as shown and described.

5. A bit for extracting broken screws, &c., comprising a hollow cylinder having internal spiral cutting-thread, and grooves formed across the ridges of the said thread, and beveled oblique cutters formed externally on one end of the said cylinder, substantially as shown and described.

6. A bit for extracting broken screws, &c., comprising a hollow cylinder having internal spiral cutting-thread, and grooves formed across the ridges of the said thread, beveled oblique cutters formed externally on one end of the said cylinder, and beveled oblique cutters formed internally on one end of the said cylinder, substantially as shown and described.

7. The combination, with a shank, of a bit held on the said shank and comprising a hollow cylinder having internal spiral cutting-thread, and grooves formed across the ridges of the said thread, and beveled oblique cutters formed externally on one end of the said cylinder, substantially as shown and described.

8. The combination, with a shank, of a bit held on the said shank and comprising a hollow cylinder having an internal spiral cutting-thread, and grooves formed across the ridges of the said thread, beveled oblique cutters formed externally on one end of the said cylinder, and a drill held in a socket on the said shank and projecting below the end of the said bit, substantially as shown and described.

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Witnesses:

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