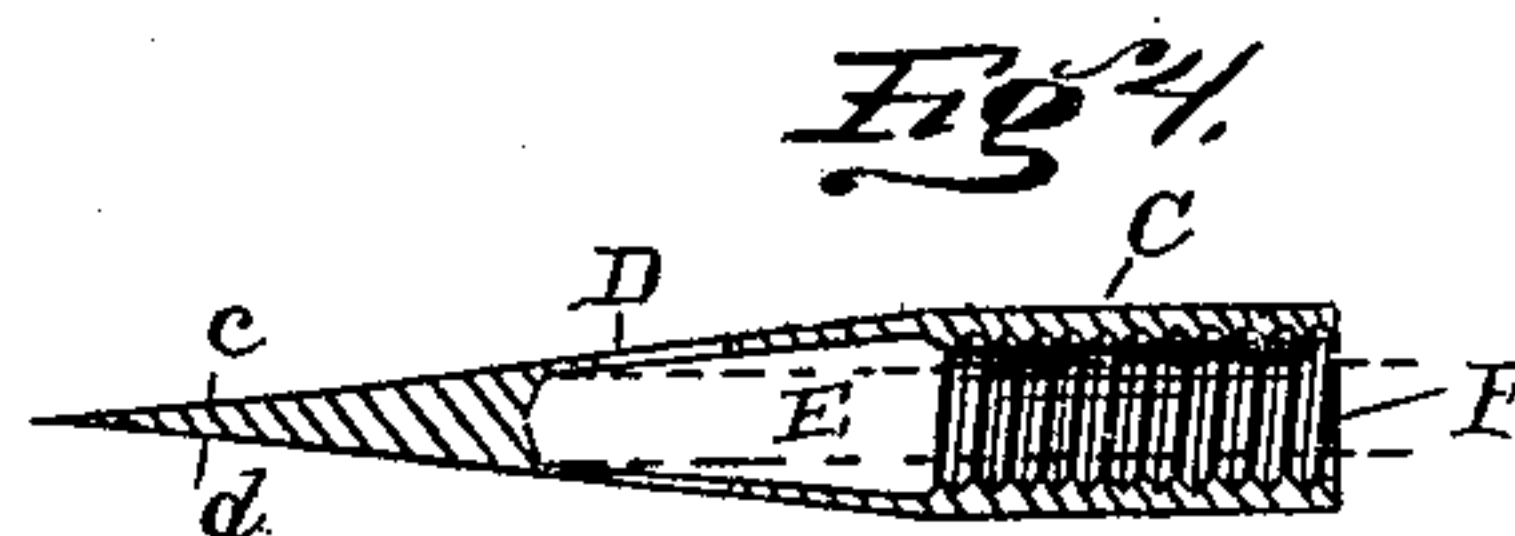
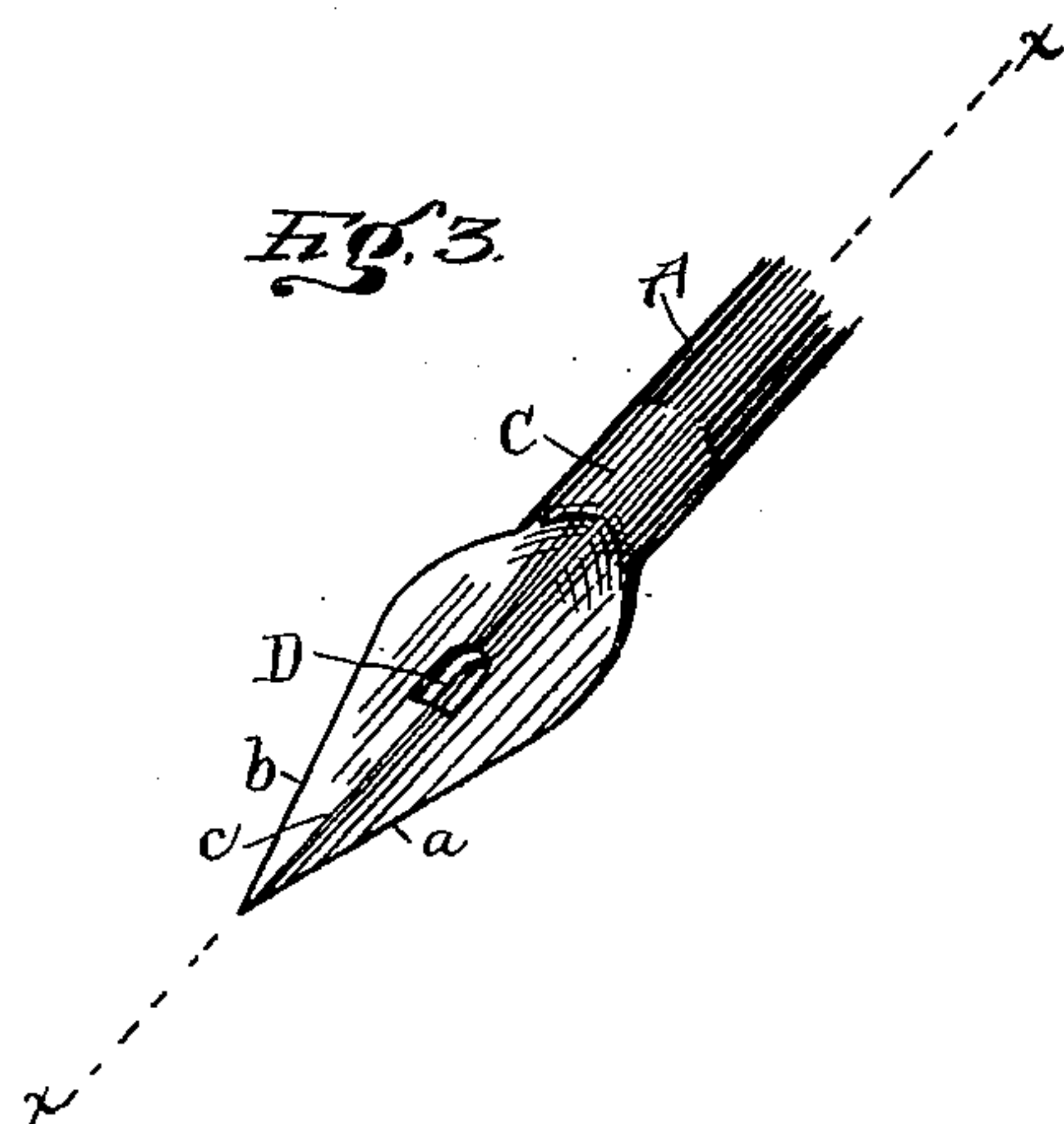
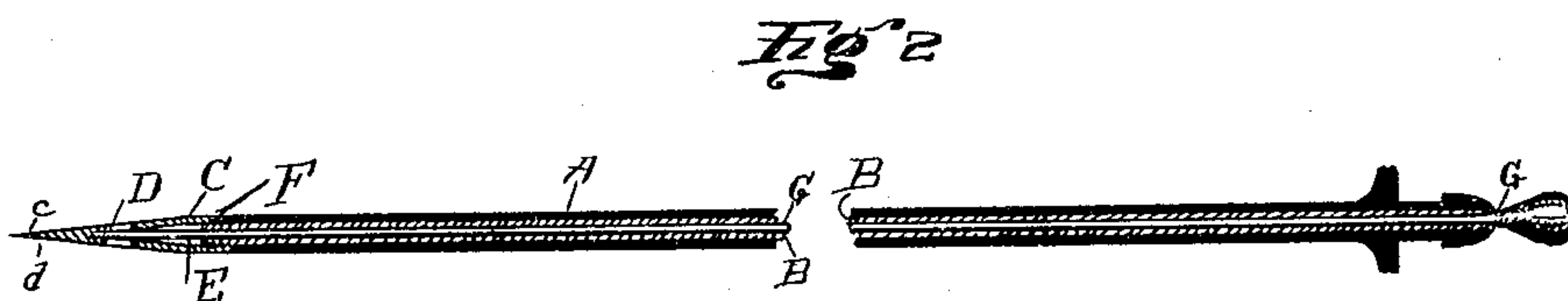
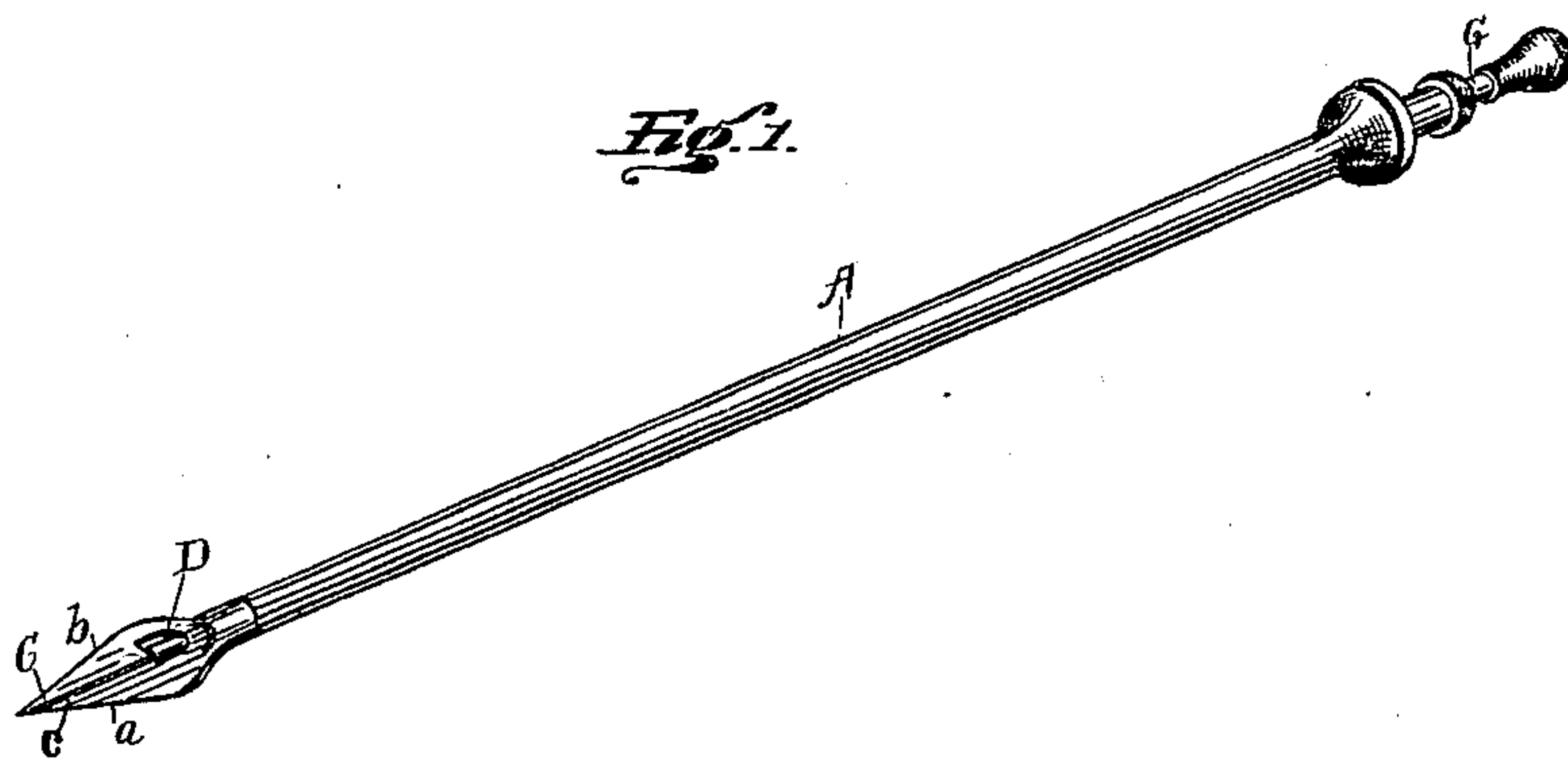


(No Model.)

J. BOMGARDNER.  
TROCAR.

No. 583,427.

Patented May 25, 1897.



Witnesses.  
C. J. Cross.  
J. A. Jiffen

Joseph Bomgardner  
Inventor.  
By Fred W. Bond  
Atty.

# UNITED STATES PATENT OFFICE.

JOSEPH BOMGARDNER, OF WILMOT, OHIO, ASSIGNOR TO SCIPIO E. BAKER,  
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## TROCAR.

SPECIFICATION forming part of Letters Patent No. 583,427, dated May 25, 1897.

Application filed December 10, 1896. Serial No. 615,088. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH BOMGARDNER, a citizen of the United States, residing at Wilmot, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Trocars, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in trocars.

The objects of my invention are (a) to so construct the tip of my trocar that it may be readily inserted into the flesh and removed therefrom without tearing the flesh and without being deflected from the line in which it is inserted, and (b) to prevent the passage in the trocar from becoming clogged.

In the accompanying drawings, on which like reference-letters indicate corresponding parts, Figure 1 is a perspective view of my improved trocar entire. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a detail perspective view of the trocar-point, and Fig. 4 a sectional view on the line *x x* of Fig. 3.

The letter A represents a vulcanized-rubber tube which snugly incases a metallic tubular core or lining B, formed of brass or other suitable metal. The lower end of this metallic tube or core is preferably screw-threaded, as shown in section in Fig. 2. Upon the screw-threaded end of this core is screwed an arrow or spear tip C, made of highly-tempered steel or other suitable metal. This tip has two diverging cutting edges *a* and *b*. From these edges and the point of the tip the metal gradually thickens until it becomes the same in diameter as the body of the trocar, thus forming a raised portion on each side of the tip, and which is greatest along a central line *c* and *d*, midway between the cutting edges. The cutting edges are tapered out until they extend considerably beyond the body of the instrument, and then they taper back in a slightly-curved line, preferably not wider than the body itself. Thus no matter whether the trocar is inserted into the flesh or withdrawn therefrom there is no possibility of tearing the flesh, as there are no irregularities to come in contact with it. Then again by thickening my tip in the manner

shown from either side of the cutting edges to the center, as also from the point of the tip along these lines, (shown at *c d*,) the tip is stiffened and consequently will not be deflected from the line in which it is inserted when the flesh or viscera is pierced, as is the case where a simple cutting-blade is used. It will also be seen that a hole D extends through the tip. This hole connects with a passage E, drilled or otherwise formed in the upper portion of the tip. A part of this passage is preferably screw-threaded, as shown at F, to screw onto the lower end of the tubular core B. When this tip is screwed into place, it snugly fits against the rubber tube A, and the tip being the same size exteriorly as the tube a smooth joint is formed. It will also be understood that the tip may be soldered or otherwise secured to the core B instead of being screwed thereon. In some cases also the tip and body of the trocar may be formed of one solid piece of metal. When this is the case, no inner tubular core is necessary.

In order to prevent the hole or opening D in the tip from becoming filled or clogged when inserted into the body of a person and for cleaning the core, I provide a plunger G, which fits the core and is long enough to extend into the tip and close the opening therein.

In using my trocar it is inserted into the flesh or viscera to the position desired, such as into the heart or other organs for embalming purposes. The plunger is removed and a pump or aspirator connected to its outer end by a rubber tube or other suitable means. The trocar is then turned about one-fourth of a revolution, which spreads the flesh away from the hole on each side of the tip and allows the blood or gases to be freely drawn out, and also allows the embalming fluid to be readily pumped into the body.

With all the trocars now on the market the openings become easily closed and require much time in keeping them open, so that the blood may be removed or the embalming fluid pumped in. This difficulty I have overcome by my improved construction.

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



1. In a trocar, a tip consisting of a flat-pointed portion and a tubular portion, and having a transverse opening in the flat portion leaving the tip solid from the opening to  
5 the point and forming communication with the tubular portion, and a tubular body joined with the tubular portion of the tip, said body forming a continuous interior passage which  
10 with the tubular portion of the tip and the transverse opening provides for withdrawing the blood and gases from the body, and for  
injecting the embalming fluid from the outer end of the instrument through it and into  
15 and out of the tip through the transverse opening.

2. In a trocar, a tubular body having a tip provided with diverging cutting edges, a transverse opening and an interior cavity, whereby the tip is widened to hold the flesh  
away from the opening by partially rotating 20 the trocar, and whereby communication is established from the interior of the orifice to the interior of the incision.

In testimony that I claim the above I have hereunto subscribed my name in the presence 25 of two witnesses.

JOSEPH BOMGARDNER.

Witnesses:

J. R. BOND,

F. W. BOND.