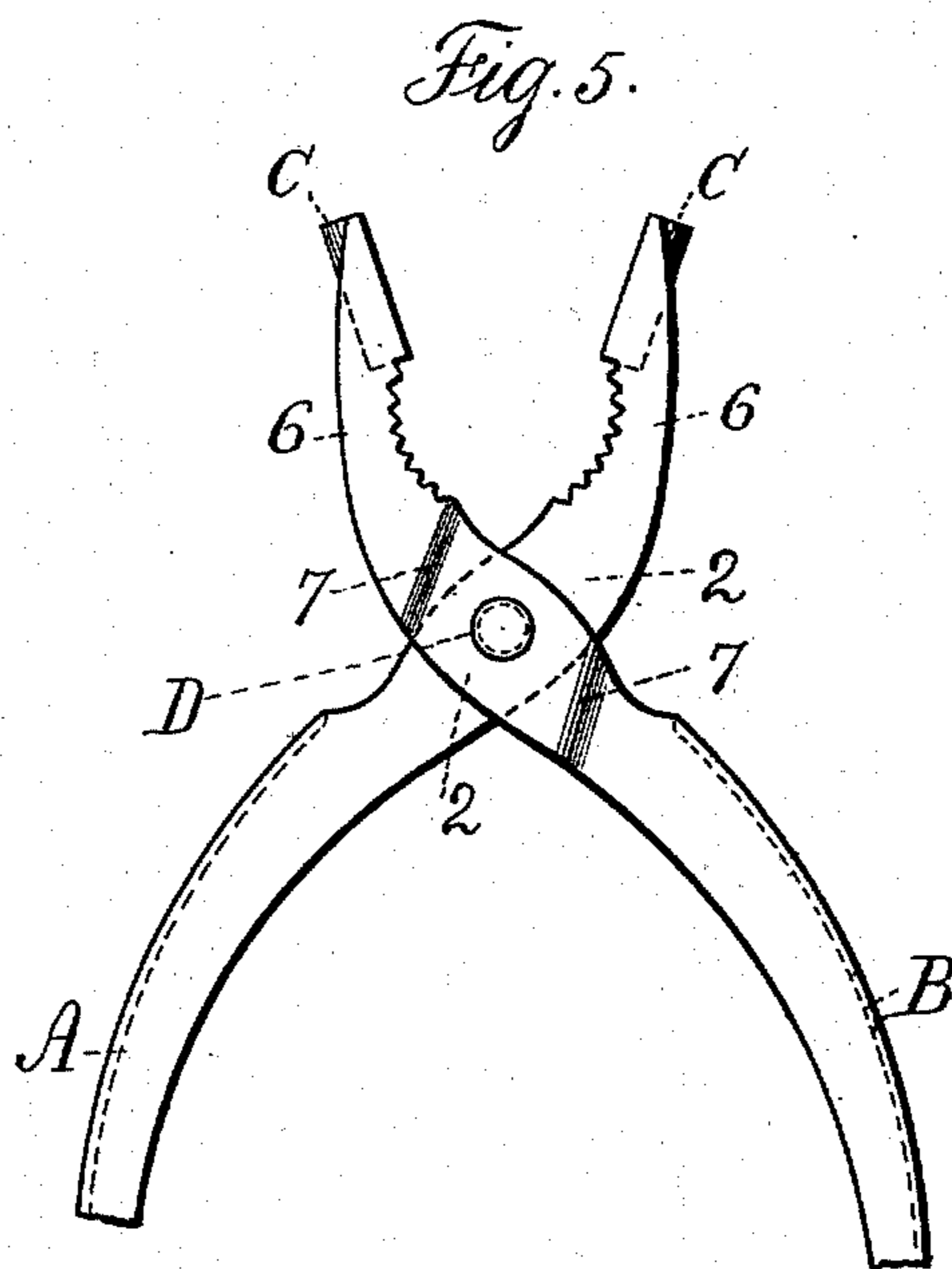
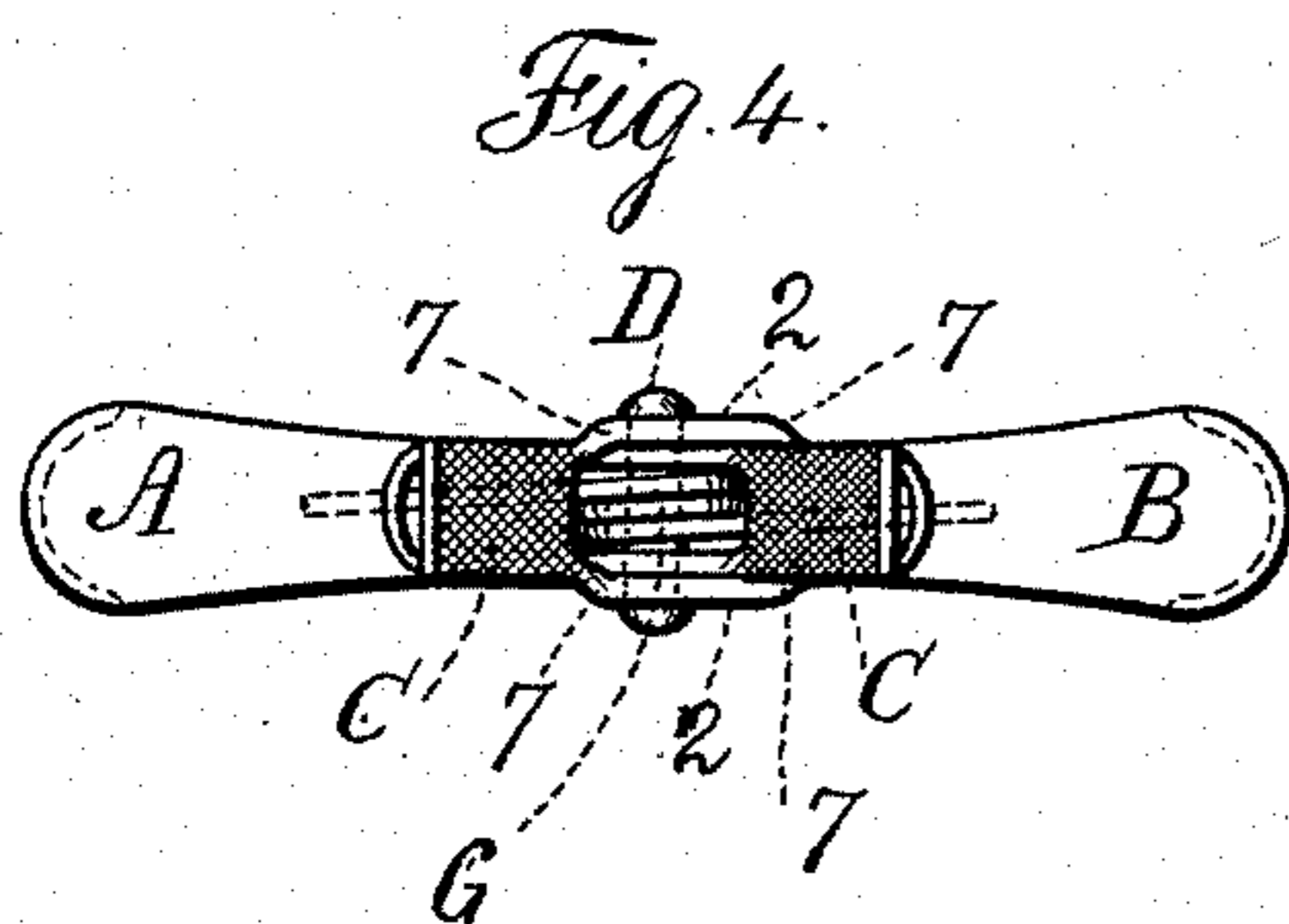
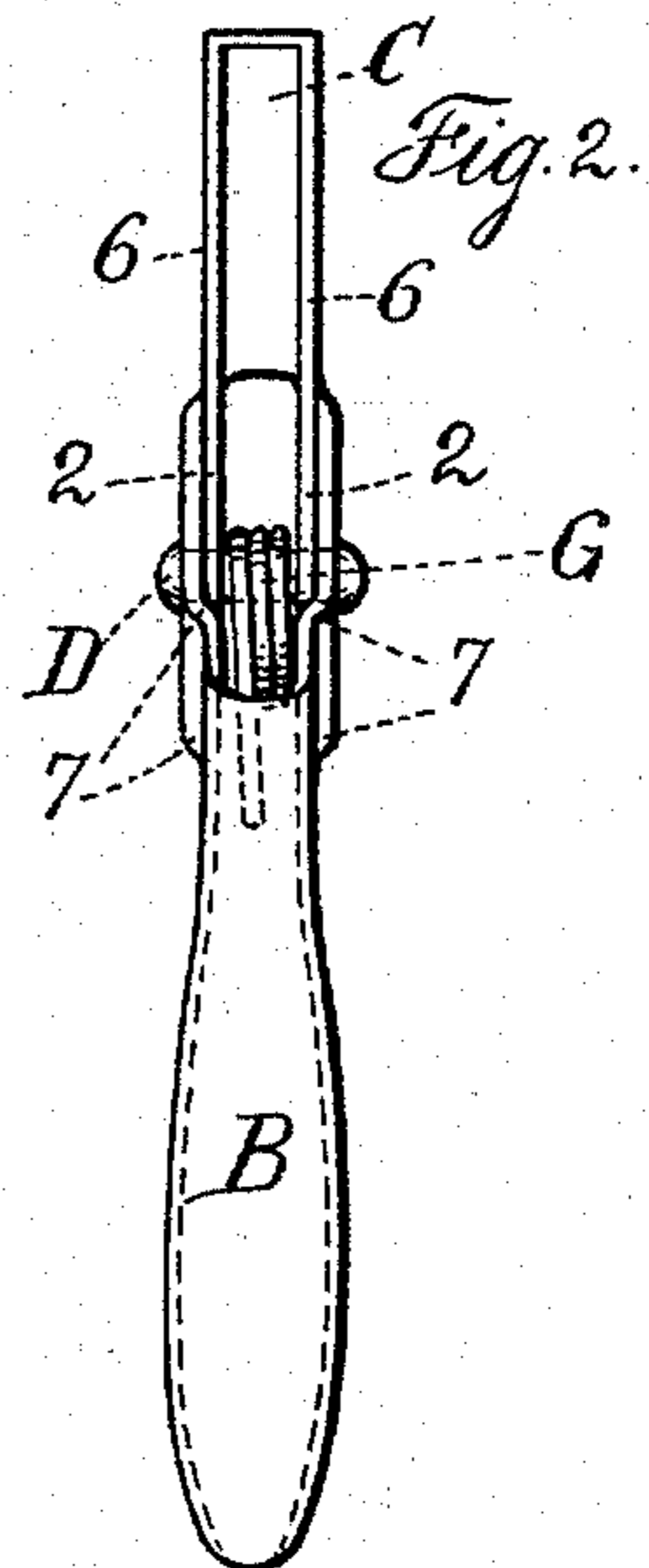
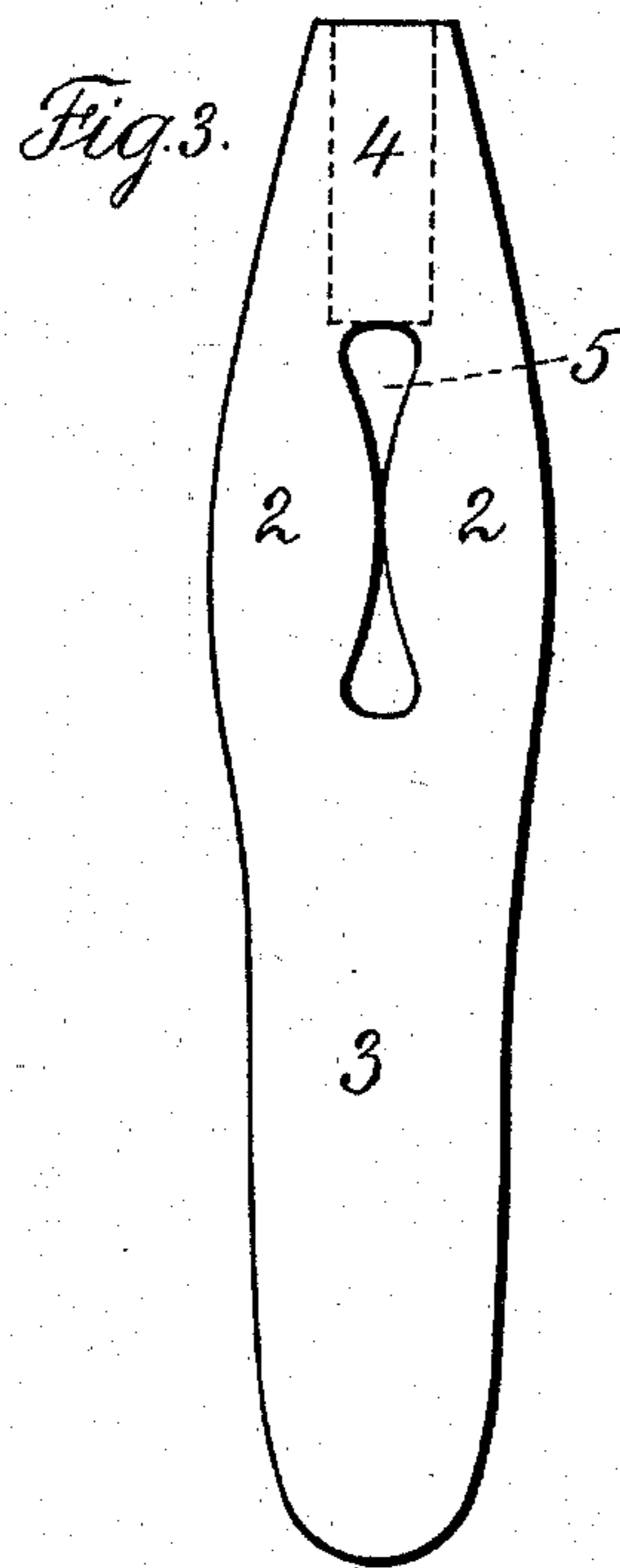
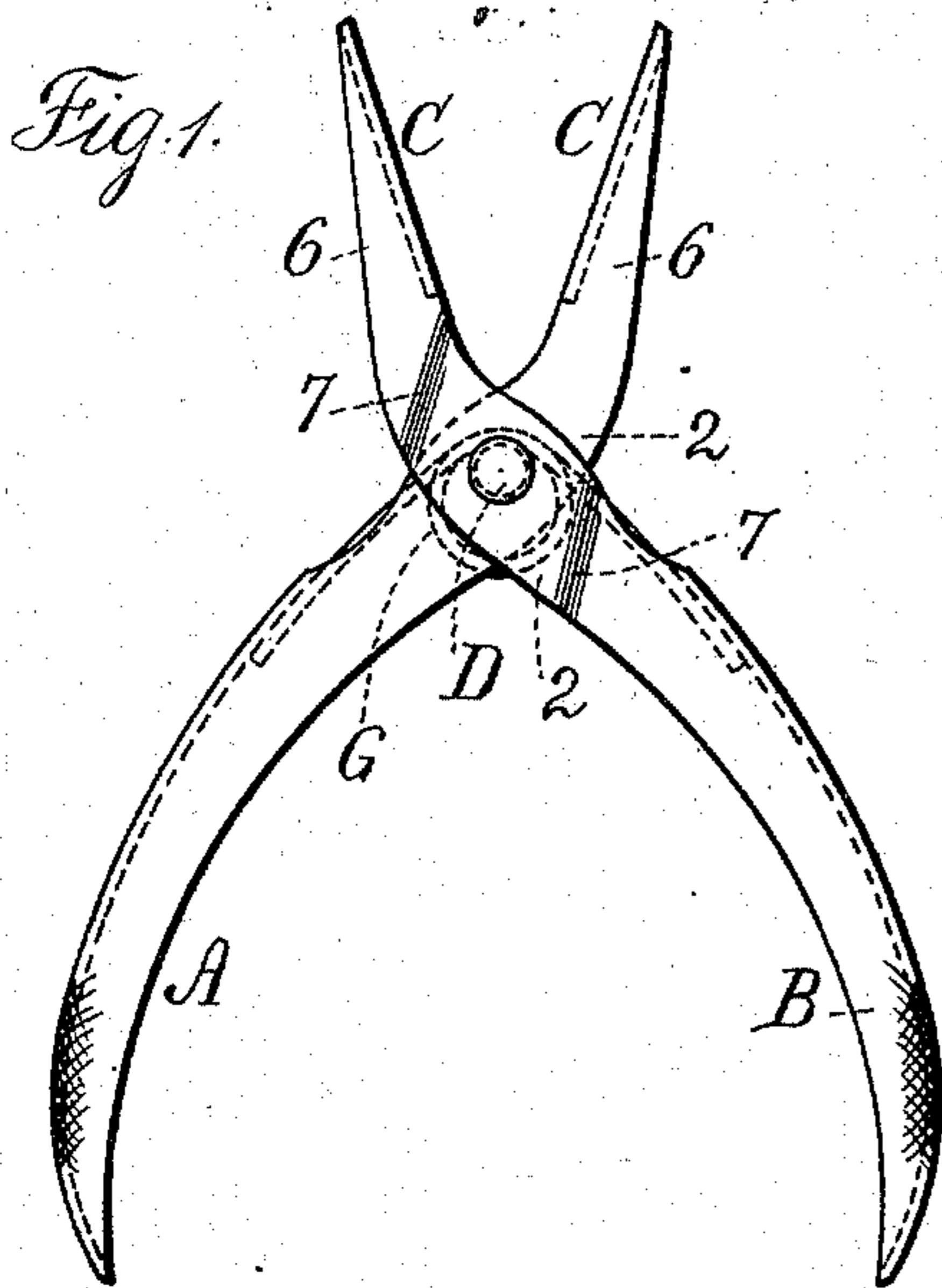


(No Model.)

W. A. BERNARD.  
PLIERS.

No. 526,479.

Patented Sept. 25, 1894.



Witnesses:  
J. Stair  
Chas. H. Smith

Inventor:  
W. A. Bernard  
per Lemuel W. Searell  
Attg.

# UNITED STATES PATENT OFFICE.

WILLIAM A. BERNARD, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE  
WM. SCHOLHORN COMPANY, OF SAME PLACE.

## PLIERS.

SPECIFICATION forming part of Letters Patent No. 526,479, dated September 25, 1894.

Application filed March 19, 1894. Serial No. 504,129. (No model.) Patented in England May 6, 1890, No. 7,002; in France September 1, 1890, No. 205,483; in Canada January 20, 1891, No. 35,834, and in Germany July 10, 1891, No. 57,617.

*To all whom it may concern:*

Be it known that I, WILLIAM A. BERNARD, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented an Improvement in Pliers, (for which Letters Patent have been granted in the following countries: Great Britain, dated May 6, 1890, No. 7,002; France, dated September 1, 1890, No. 205,483; German Empire, dated July 10, 1891, No. 57,617, and Canada, dated January 20, 1891, No. 35,834,) of which the following is a specification.

Pliers have heretofore usually been made with solid handles and jaws, but these are heavy and clumsy, especially with large pliers that are required for light service, and in addition to this it is difficult to proportion the strength of the respective parts, and the joint between the handles is liable to be defective and to give way under strain.

Pliers have been made in which the handles are of sheet metal and struck up hollow and the sheet metal parts cross each other at the joint and are riveted together either by one rivet passing through the parts or by two rivets in line with each other and joining the respective pairs of crossing plates. Pliers of this character are represented in Letters Patent No. 427,220, granted to me May 6, 1890, but in pliers of this kind the jaws themselves have been made of separate pieces of metal introduced between the sheet metal of the lever handles.

My present invention relates to pliers in which the jaws are made of sheet metal, as well as the handles, so that only two pieces of metal are necessarily employed in addition to the connecting rivet or rivets, and the jaw faces are stiffened and strengthened by the sheet metal bent at right angles to the faces and forming back flanges that extend to or are continuations of the sheet metal parts that cross at the pivot or hinge and are continuations of the hollow sheet metal handles. By this construction I am enabled to cut out the sheet metal blanks and stamp the same up to shape in proper dies so as to require little or no hand finishing, and the one

part is adapted to pass through the opening in the other part and be connected by a cross rivet, and the pliers are very strong and light.

In the drawings, Figure 1 is a side view, and Fig. 2 an edge view of the pliers complete. Fig. 3 represents the blank made use of as the same is cut out from the sheet steel or other metal previous to being stamped up to shape in suitable dies. Fig. 4 is a view endwise of the plier jaws. Fig. 5 shows a modification in the shape of the jaws.

The size, shape and proportions of the respective parts will vary according to the object for which the pliers may be constructed. In pliers that are used for the needles of knitting machines, the jaws are long and slender. In pliers made use of for wire workers, the jaws will be shorter in proportion to the length of the handles. The mode of constructing the pliers however will be apparent from the following description.

The sheet metal blank will usually be of the same size and shape for the two jaws and handles; that is to say, the portion 3 of the blank will be used for the handles, the portion 2 for the crossing plates through which the pivot pin or rivet D passes, and the portion 4 is adapted to be formed into a jaw of the desired shape, and there is to be cut through the sheet metal a mortise at 5.

In stamping up the sheet metal blank the handle portions are concaved or hollowed and may be roughened upon the exterior surface as usual in plier handles. The portions 2 of the sheet metal are bent up parallel to each other so as to form an open mortise, and the portions 4 are bent up so as to form flanges at 6 in the edges of the jaw faces C, and hence the flanges 6 are continuations of the flat plate portions 2 through which the pivot pin D passes; and I remark that inasmuch as one jaw has to pass through the mortise between the handle and jaw of the opposite piece, it is necessary to spread the plate 2 farther apart between the handle B and jaw C, so that the jaw of the handle A or the handle A itself may be passed through the opening between the plates of the handle B, and with this object in view it is ad-

vantageous to bend the sheet metal with offsets at 7 in order that the edges of the jaws may be in line with each other and to facilitate the construction of the parts.

5 I do not limit myself to any size or shape of handles or jaws, as these may be properly proportioned to adapt the pliers to the desired use; and I remark that the adjacent faces of the jaws may be roughened as usual  
10 in pliers or be made concave or convex, or provided with teeth upon the opposite edges of the sheet metal flanges, as represented in Fig. 5, so as to adapt the pliers to pipes or round articles.

15 By placing the coiled spring G between the parts of the handles at the pivot so that the pivot pin holds such coil, the ends of the coiled spring will be within the U-shaped sheet metal of the handles and tend to open  
20 the pliers, and this is a convenience, especially in pliers that are used for rapid and light work.

I claim as my invention—

25 1. The pliers made of sheet metal in two parts each part being cut with a mortise and stamped up with a hollow handle and parallel side plates that extend and form edge flanges behind the jaw faces, the parallel side plates of one handle and jaw passing through the  
30 opening between the parallel side plates of the other handle and jaw and being con-

nected by a pivot and the similar jaw-faces coinciding substantially as specified.

2. The pliers made of sheet metal in two parts each part being cut with a mortise and stamped up with a hollow handle and parallel side plates that extend and form edge flanges behind the jaw face, the parallel side plates of one handle and jaw passing through the opening between the parallel side plates of the other handle and jaw and being connected by a pivot and having teeth upon the opposite edges of the parallel side plates and the similar jaw-faces coinciding, substantially as specified.

3. The pliers made of sheet metal in two parts each part being cut with a mortise and stamped up with a hollow handle and parallel side plates that extend and form edge flanges behind the jaw face, the parallel side plates of one handle and jaw passing through the opening between the parallel side plates of the other handle and jaw and being connected by a pivot, and a spring around the pivot pin with its ends within the hollow sheet metal handles, substantially as specified.

Signed by me this 13th day of March, 1894.

WILLIAM A. BERNARD.

Witnesses:

HENRY STALEY,  
FRANK. C. ALTMANN.