

(No Model.)

J. D. COX, JR. & W. T. ARMSTRONG.  
MEANS FOR HOLDING TWIST DRILLS OR OTHER TOOLS.

No. 548,037.

Patented Oct. 15, 1895.

Fig. 1.

Fig. 4.

Fig. 2.

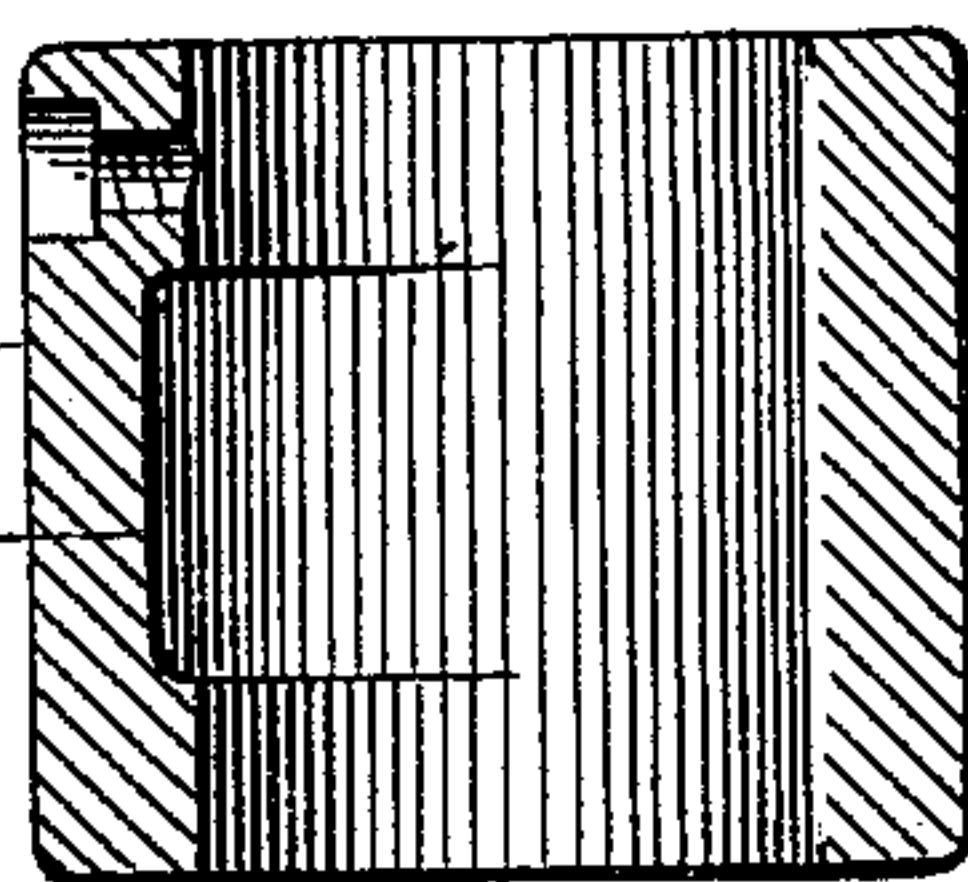
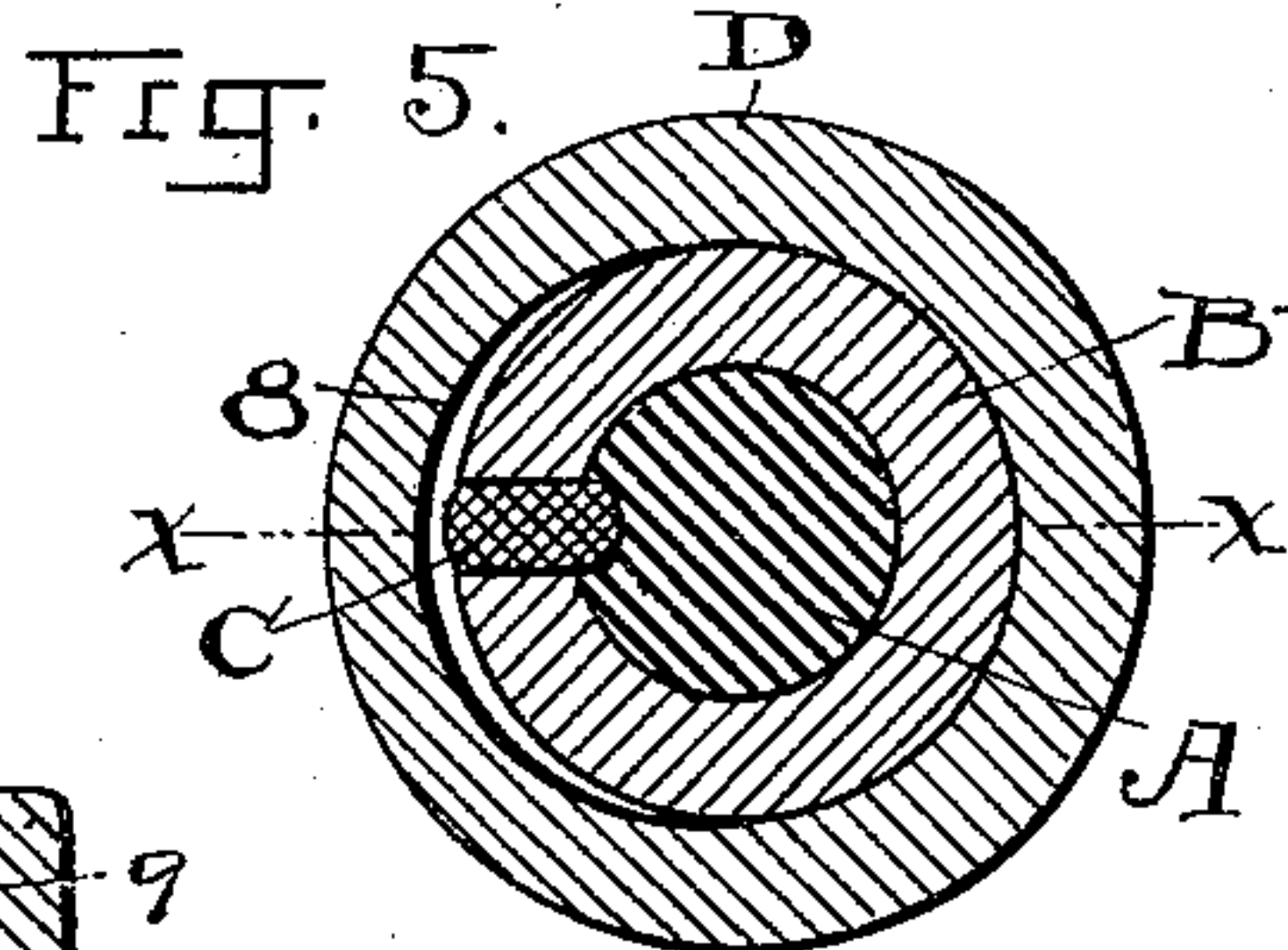
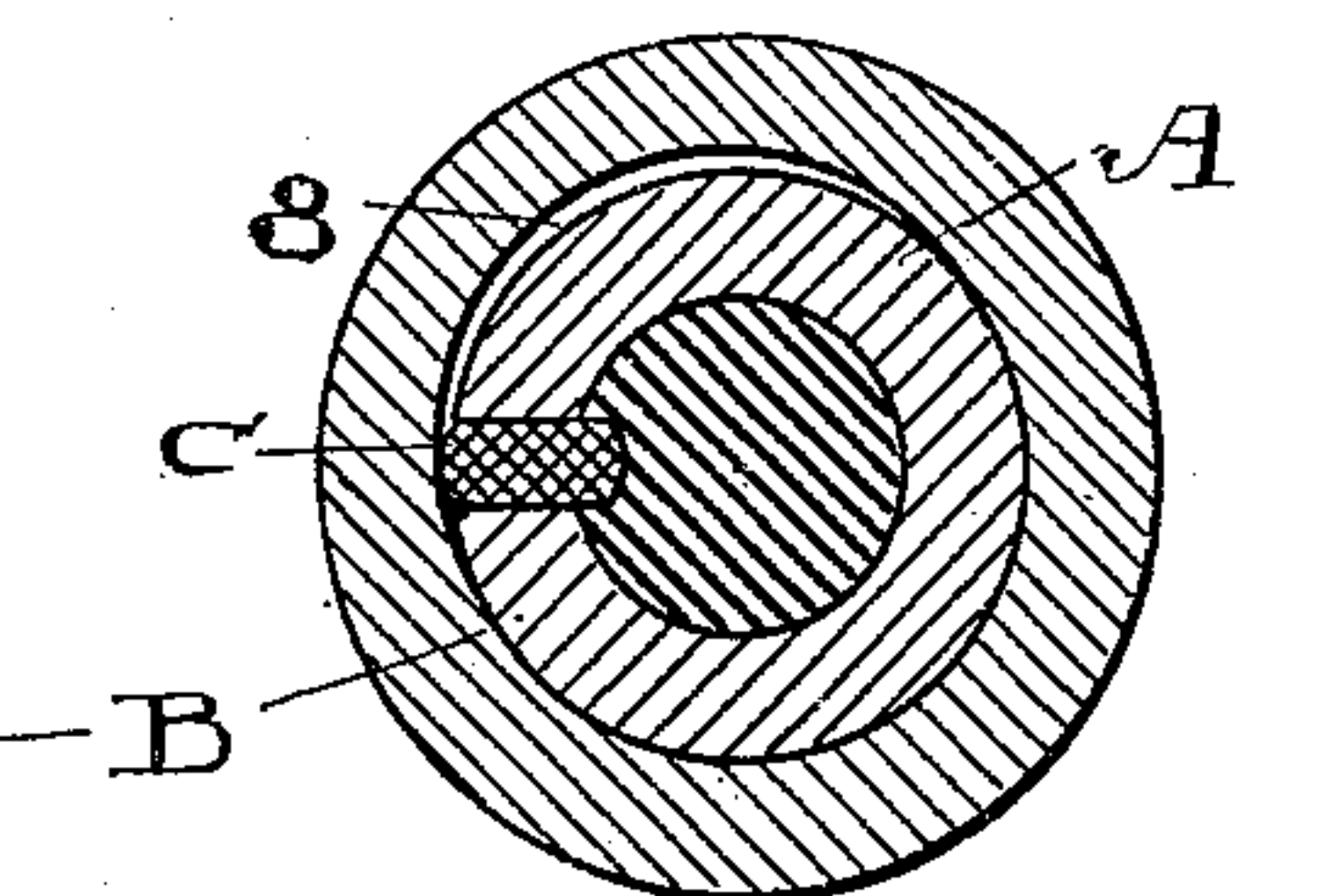
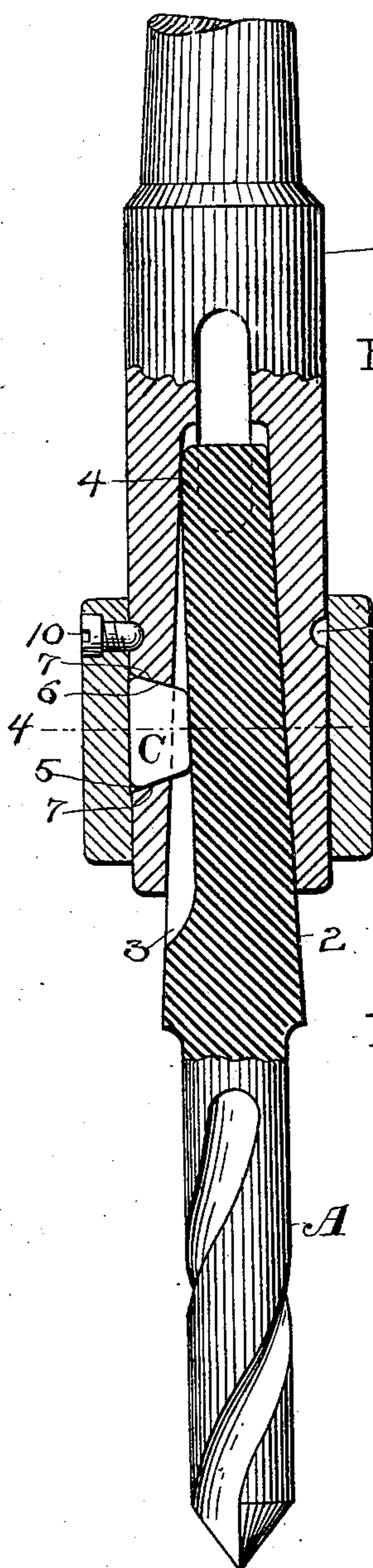


Fig. 6

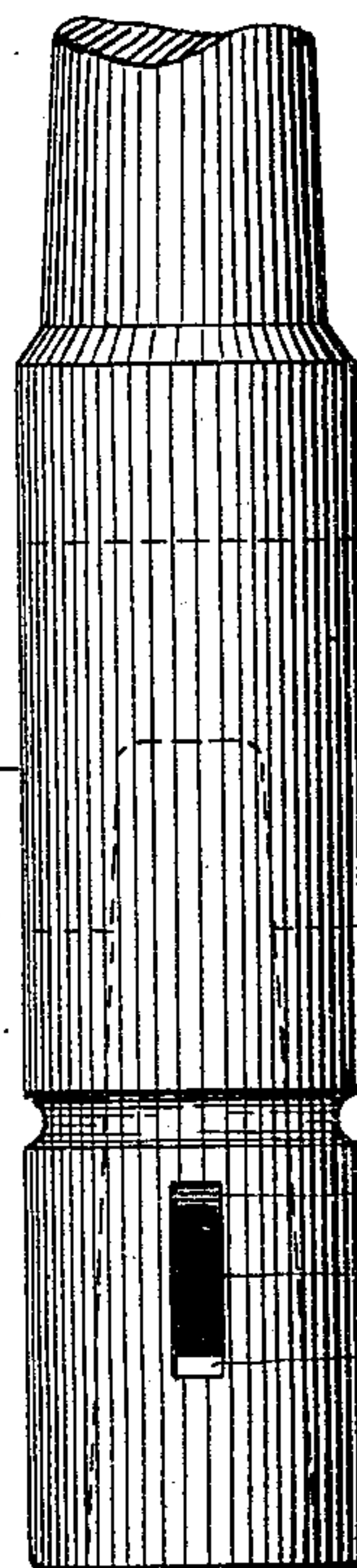


Fig. 7.

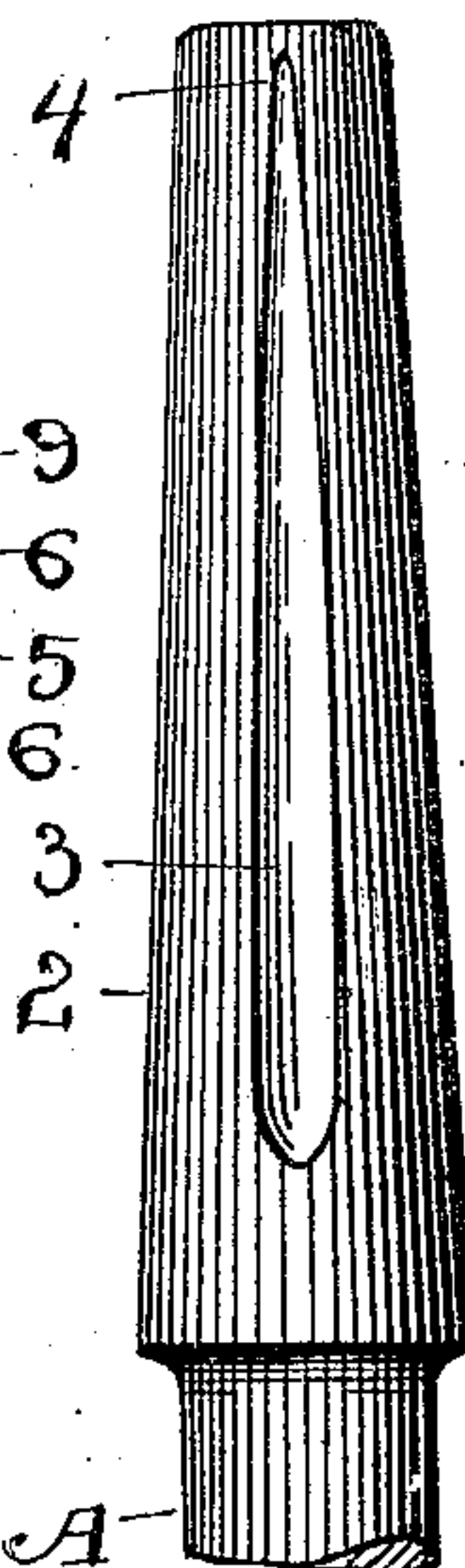
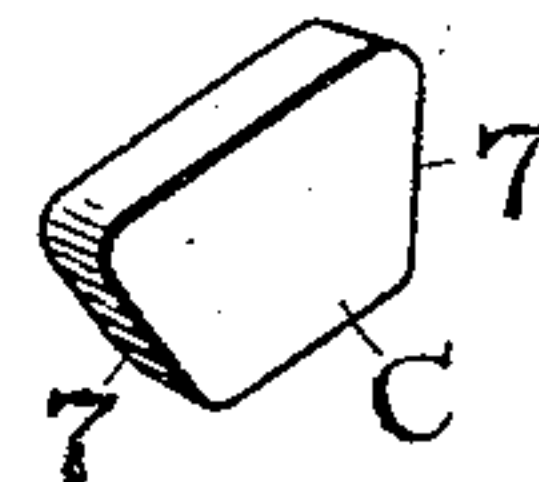


Fig. 3.

ATTEST.

R. B. Moser

*G. S. Scharff*

INVENTORS

Jacob D. Cox, Jr.

William T. Armstrong

By *H. J. Fisher* ATTORNEY.



# UNITED STATES PATENT OFFICE.

JACOB D. COX, JR., AND WILLIAM TELFER ARMSTRONG, OF CLEVELAND,  
OHIO, ASSIGNORS TO COX & PRENTISS, OF SAME PLACE.

## MEANS FOR HOLDING TWIST-DRILLS OR OTHER TOOLS.

SPECIFICATION forming part of Letters Patent No. 548,037, dated October 15, 1895.

Application filed February 9, 1894. Serial No. 499,578. (No model.)

*To all whom it may concern:*

Be it known that we, JACOB D. COX, JR., and WILLIAM TELFER ARMSTRONG, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Means for Holding Twist-Drills or Other Tools; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to improvements in means for holding twist-drills and other tools, and the object of the invention is to obviate and overcome certain objections which are incident to the means hitherto employed. Thus, for example, in the ordinary form of taper shank used on twist-drills and other tools held in the same way there is a flattened end called a "tang" which enters a transverse slot cut through the socket or chuck, and the whole strain, or most of it, when the tool is in operation, comes on this tang, so that very frequently the tang is twisted off and the usefulness of the tool is destroyed. It also frequently happens that the tang of the drill or tool cuts or reams out the slot in the socket, so that it will no longer catch or drive the tool, when the usefulness of the socket is destroyed.

The object of our invention, therefore, is to overcome both of these objections and to provide means for driving and holding the tools whereby they are not only turned around positively and powerfully without depending wholly on the tang or flattened portion, but which also prevents them from accidentally falling out of their socket. Furthermore, by the use of our invention sockets and tools that have been rendered worthless by the twisting off of tangs or the reaming out of the socket, as above described, are again made useful, and as far as the driving of them is concerned are as good as new.

The invention, therefore, consists in the construction and combination of parts substantially as herein shown and described, and particularly pointed out in the claim.

In the accompanying drawings, Figure 1 is an elevation, partly in section, of a twist-drill

and the fastening mechanism combined, and as the parts appear when the drill or other tool is held in the chuck or socket. Fig. 2 is an elevation of the chuck itself with the upper part of its spindle broken off, as also occurs in Fig. 1. Fig. 3 is an elevation of the upper end of the drill, showing the shank thereof and the longitudinal groove or depression therein. Fig. 4 is a cross-section on line 4 4, Fig. 1, showing the parts in the relation they assume when the key is held in its position upon the tool-shank as in operation; and Fig. 5 is a view on the same line with the parts in the reverse position, or as they appear when the key is relieved from pressure and is movable sufficiently to withdraw or replace the tool. Fig. 6 is a central longitudinal section of the sleeve for holding the key, and shown in working position in Fig. 1. Fig. 7 is a perspective view of the locking-key alone.

The drill or tool A has a shank 2, provided with a longitudinal groove or equivalent depression 3, which feathers out near the extremity of the shank and is deepest at its inner end. The bottom of this depression at its deepest point is nearer the axial center of the shank than at the point 4, where it loses itself upon the surface of the shank. The shank is not materially impaired in strength by reason of this depression. The chuck or socket B has an opening or slot 5 through its side at right angles to the socket, and as here shown the edges or ends 6 converge somewhat, so as to narrow the slot at the shank, thereby giving a slightly wedge shape. The key C, which enters the slot, is seated upon its edges 7 on the inclined edges 6 when it rests in working position in the groove, channel, or depression 3. This shape and seating prevent the key from dropping any farther inward when the shank is withdrawn and leaves the key in position not to obstruct or hinder the insertion of the tool. Practically the key may be said to be loose in its slot, but permanently confined therein, and it is in engaged or disengaged position in respect to the tool according as the collar or sleeve D is in one position or another in relation thereto. Thus, referring to Fig. 6, in which we have a view of the collar corresponding to a cross-section on line  $\alpha \alpha$ , Fig. 5, we see that there is an internal



eccentric depression 8 in the said collar, substantially as shown in Figs. 5 and 6. For all practical purposes the depth of said eccentric may be relatively less than what is here shown  
 5 and need be only as deep as the movement required by the key C to lock or unlock the shank of the tool, and this difference is the difference in the depth of the depression 3 at its inner end to the axial center of the shank  
 10 as compared with the depth of point 4 to said axial center. The difference at the two points may be scarcely noticeable to the eye and yet be sufficient to lock and hold the tool. Hence the depth of the eccentric in the collar need  
 15 be only sufficient to give the key C the slight back-and-forth movement which the relative depths of the depression 3 at the point 4 and at its inner end may require. However, to more clearly illustrate the invention we have  
 20 shown a greater depth to the eccentric depression 8 than is required. This eccentric extends about half way around on the inside of the sleeve D, and when the key C is to be released the collar is turned so as to give its greatest  
 25 depth of eccentricity to the key, thereby forming a space into which the key may back and release the tool. When the tool has been replaced, it is only necessary to turn the sleeve D, so as to carry the eccentric away and allow the  
 30 straight surface of the sleeve to bear the key down into the channel 3 and hold the tool, as in Fig. 1. When the parts are constructed as herein shown and described, the tool is held positively and cannot twist in its socket  
 35 or be withdrawn or removed without personally turning the sleeve or collar D, so as to again expose the eccentric to the key and release it. The chuck or socket is provided with an annular groove 9, in which is engaged  
 40 a set-screw 10 on the collar, so that the collar will hold its proper place on the chuck when it is turned in any direction, and it may be turned in either direction. Suitable marks upon the collar and chuck, respectively, may  
 45 be employed, so as to show the place of the eccentric on the collar and the place of the key in the chuck, and when these marks are brought into proper relation one to another it will be known that the depth of the eccentric is opposite the key and the tool can then  
 50 be removed or replaced.

It will be seen by the foregoing description and drawings that the invention is supple-

mental to and based upon the old and well-known socket and tool shank of commerce, which have been in use for many years and  
 55 which are practically the common and universal construction of to-day. These constructions embody a tapered socket and a tapered tool-shank, the taper serving to accurately center the tool and to insure the perfect contact of the surface of the shank at all  
 60 points with the surface of the socket. Now, having this construction and the usual tang on the extremity of the tool to prevent it from turning in the socket, we take the socket and  
 65 tool as thus found and used and adapt our improvement thereto. Thus the tool-shank has the longitudinal groove 3 found therein in addition to the tang at its extremity, and the socket has the opening 5 found in its side.  
 70 In other respects both these parts are left exactly as before and are unchanged. This being done we provide a key C to occupy said opening or slot, as hereinbefore described, and a rotating collar with an internal cam-  
 75 surface to ride over said key and lock or release the same as the collar is turned one way or another. This produces an essentially new socket retaining the old construction in all its material respects and adding thereto means  
 80 which greatly increase its driving-power and general efficiency and utility, and thus also meeting the new demands on this class of tools, which require that they shall do more work and endure greater strain than hereto-  
 85 fore.

Having thus described our invention, what we claim is—

The common and well known form of drill or tool socket as shown and described, and  
 90 constructed with an opening through its side for a locking key, a key in said opening, and a rotatable sleeve secured to said socket having an internal cam surface over said key,  
 95 jointly with a tool having a shank with a longitudinal groove deepening toward the base of the shank and engaged by said key, substantially as described.

Witness our hands to the foregoing specification this 3d day of February, 1894.

JACOB D. COX, JR.

WILLIAM TELFER ARMSTRONG.

Witnesses:

H. T. FISHER,

GEORGIA SCHAEFFER.