

(No Model.)

2 Sheets—Sheet 1.

J. GOODRICH.

TOOL FOR GRASPING AND HOLDING ARTICLES.

No. 308,356.

Patented Nov. 25, 1884.

Fig. 3. Fig. 4. Fig. 1. Fig. 2.

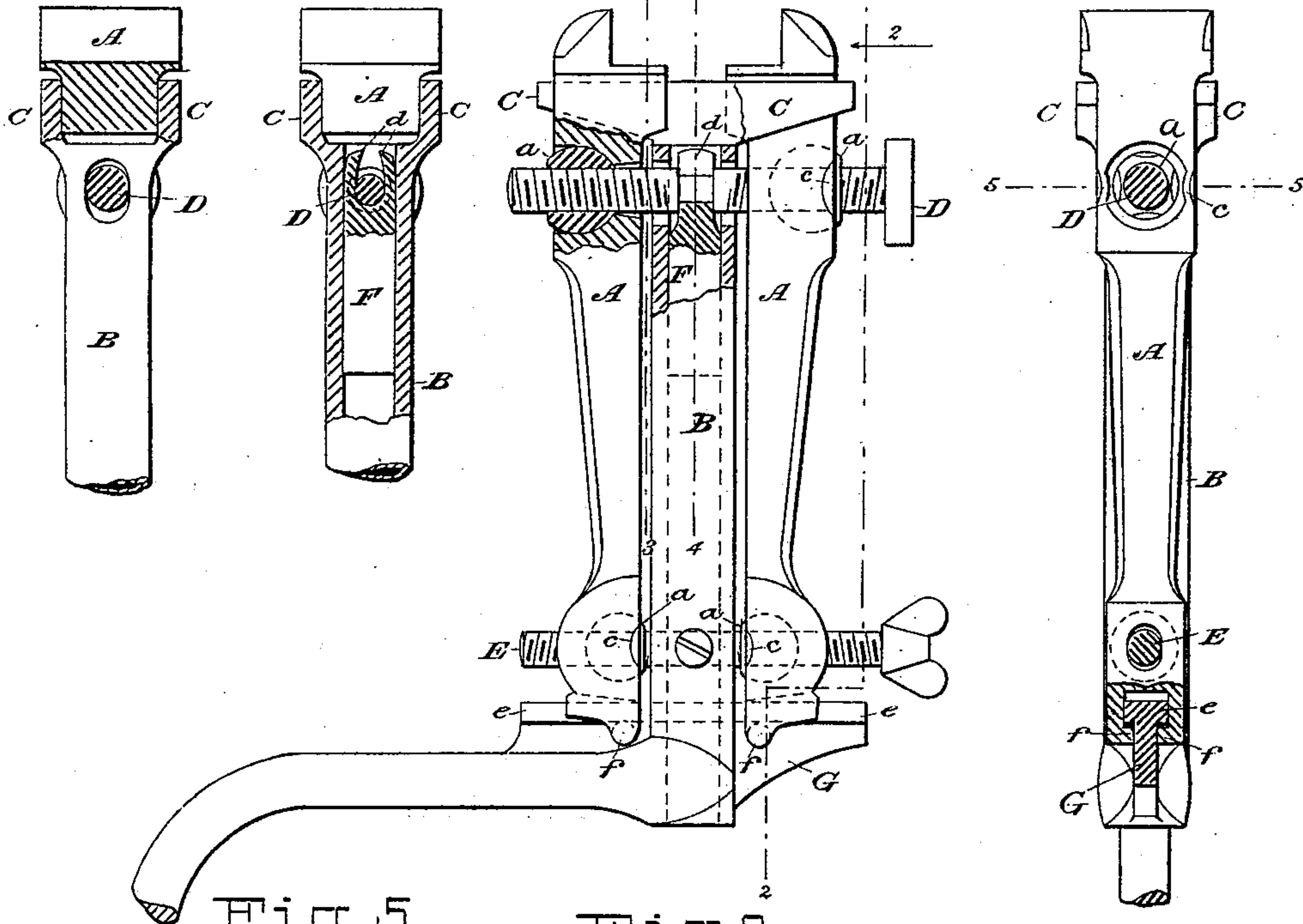


Fig. 5.

Fig. 6.

Fig. 7.

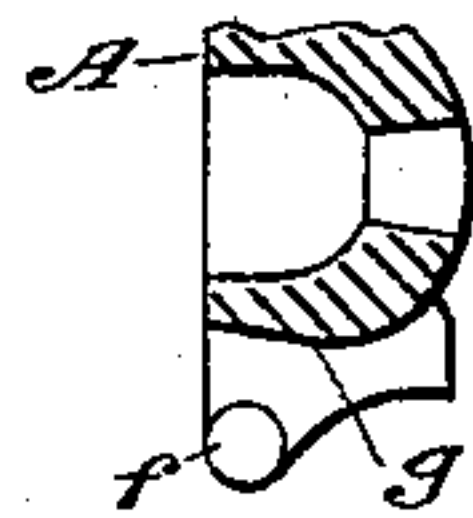
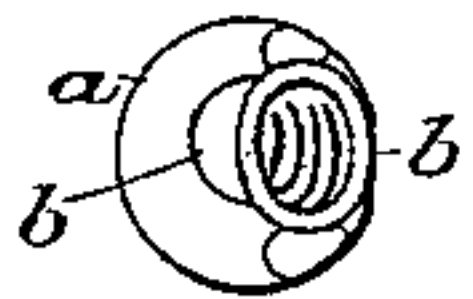
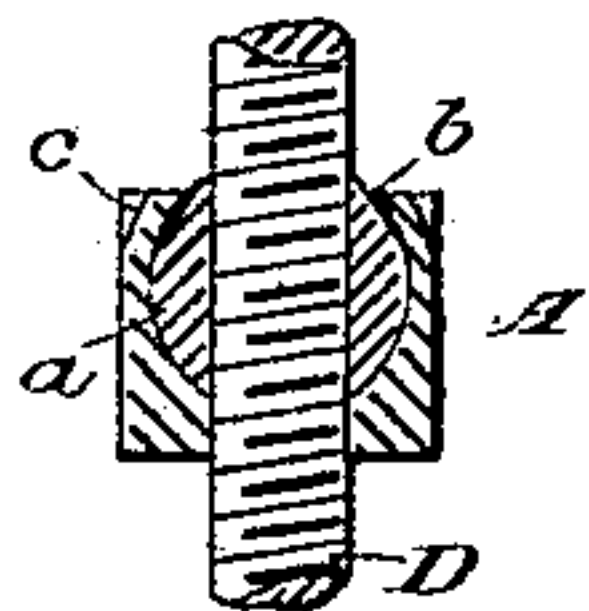
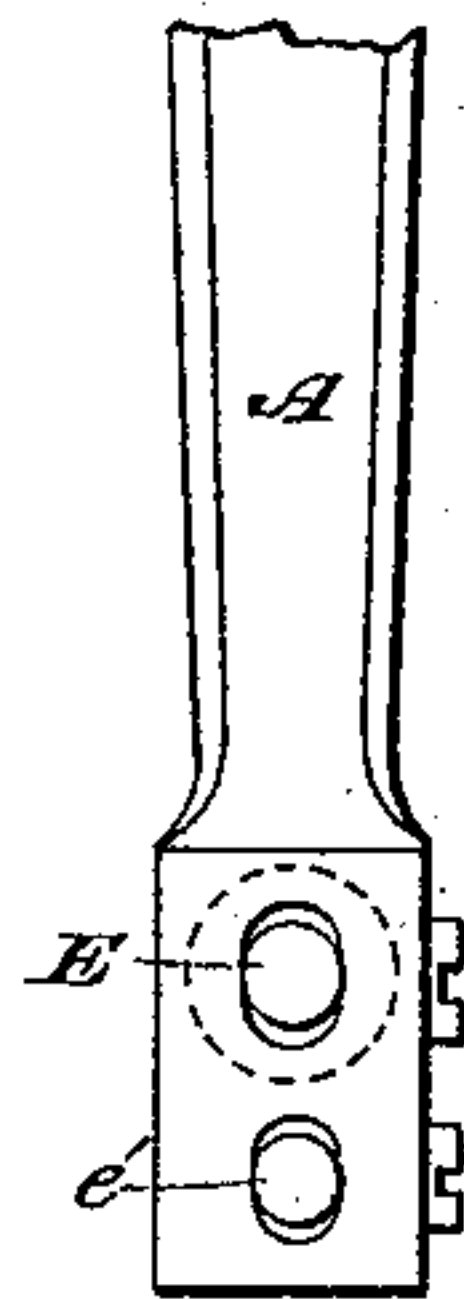
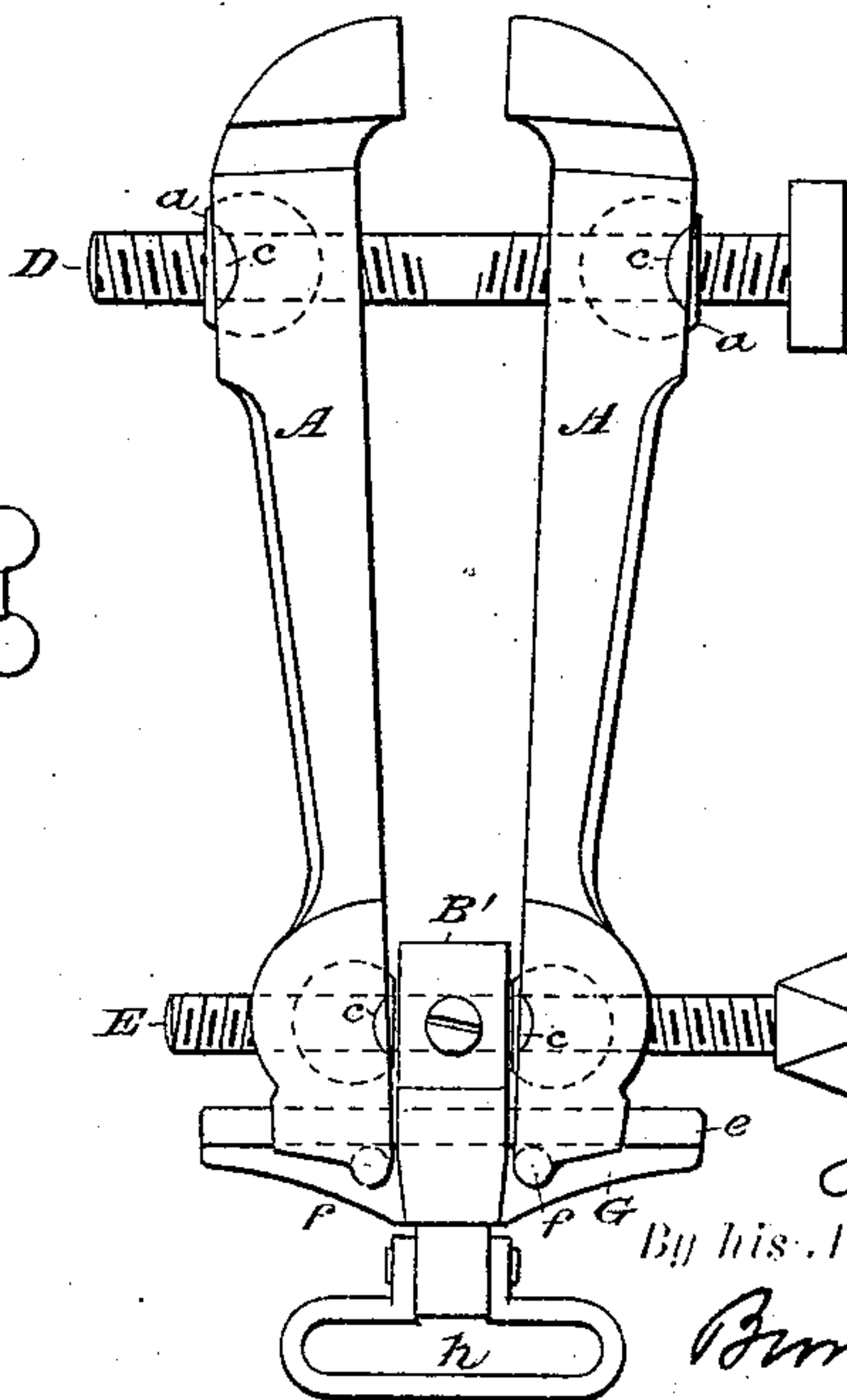
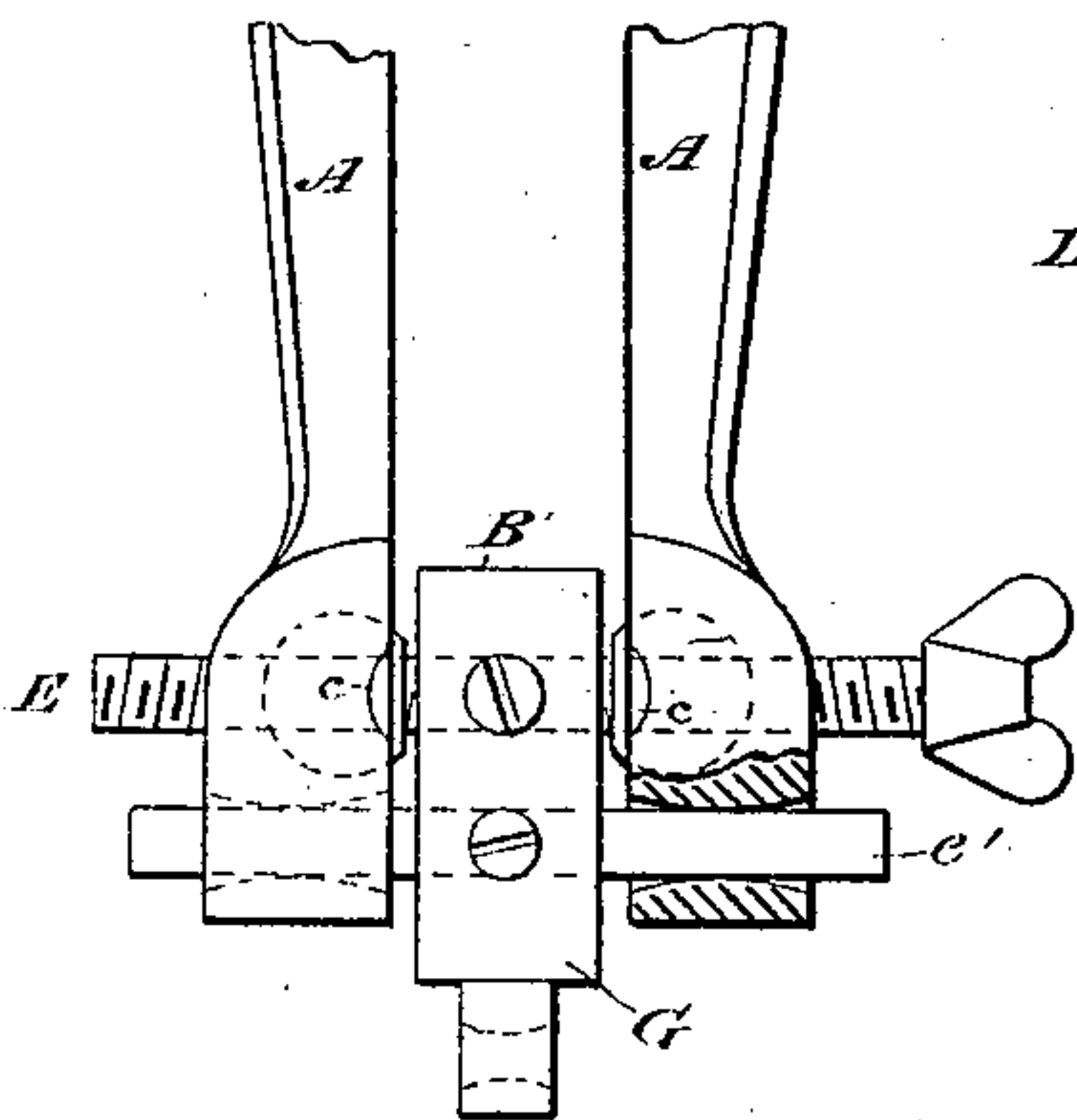


Fig. 8.

Fig. 10.

Fig. 10.



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Fig. 9.

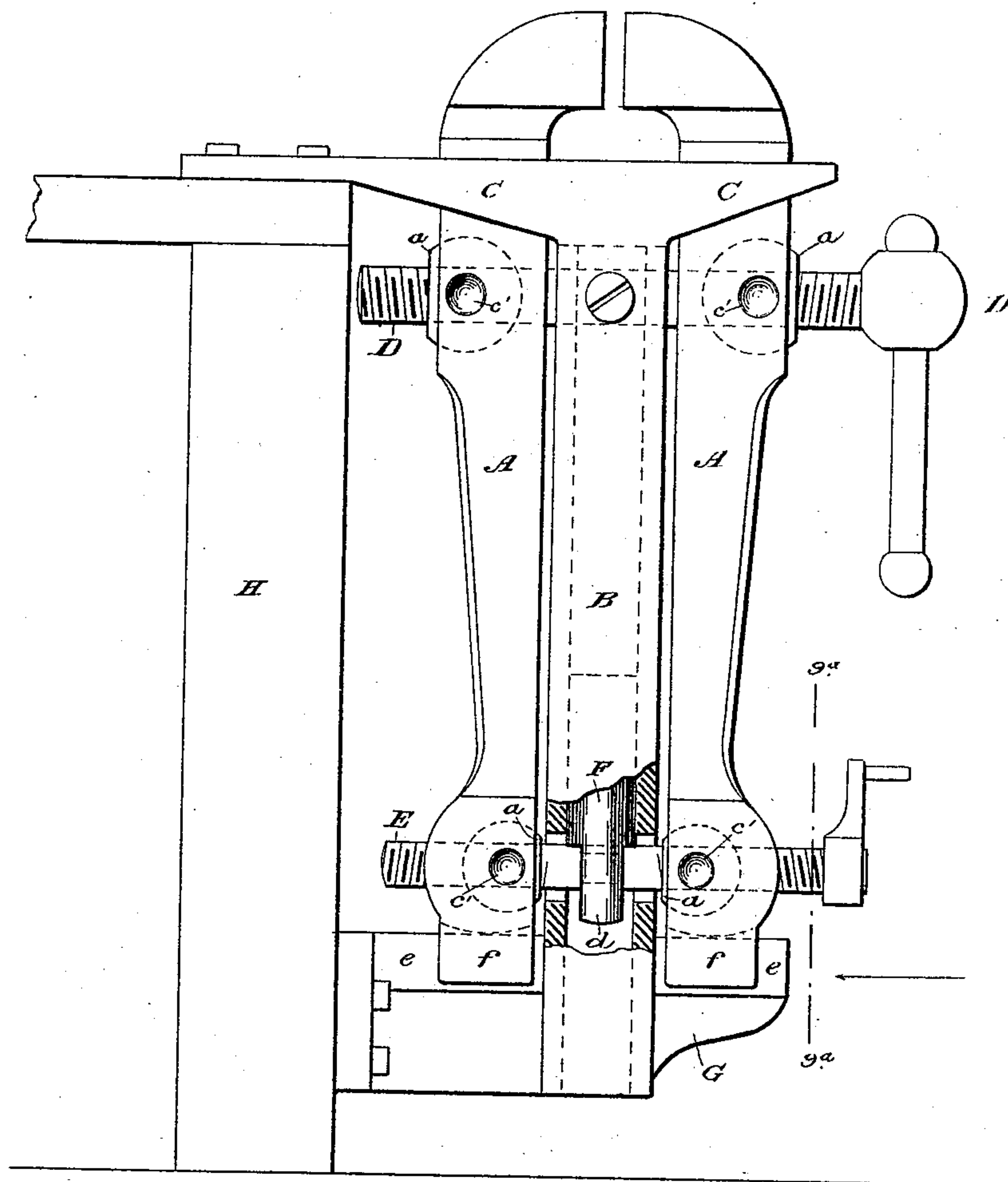


Fig. 9a

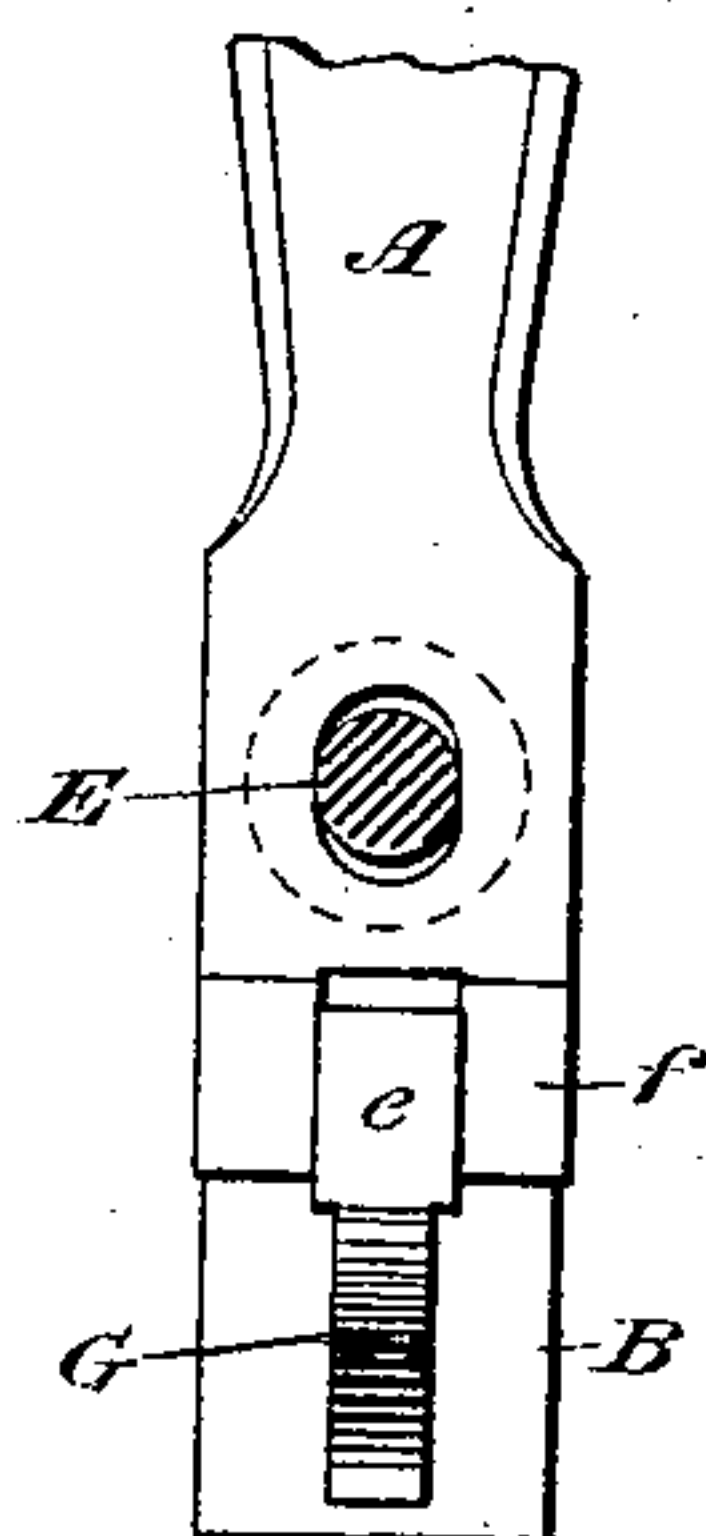
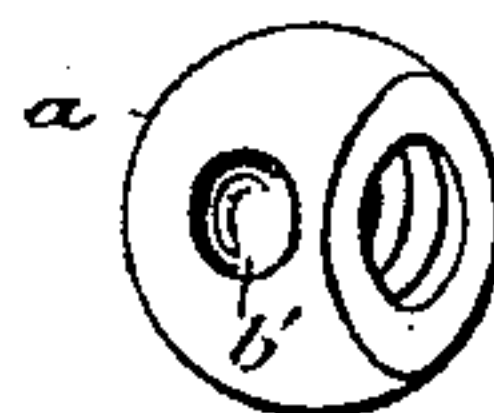


Fig. 9b.



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UNITED STATES PATENT OFFICE.

JOSEPH GOODRICH, OF HENRY, ILLINOIS.

TOOL FOR GRASPING AND HOLDING ARTICLES.

SPECIFICATION forming part of Letters Patent No. 308,356, dated November 25, 1884.

Application filed May 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH GOODRICH, a citizen of the United States, residing at Henry, Marshall county, Illinois, have invented certain Improvements in Tools for Grasping and Holding Articles, of which the following is a specification.

My invention relates, mainly, to improvements in that class of vises and brace-wrenches which employ a tail-screw to spread the tails of the jaws, being an improvement on the tool shown in my former patents.

The invention relates in part to the peculiar form and construction of the nuts employed, and in part to means for steadying the tails of the jaws to prevent distortion when the tool is subjected to torsional strains, and to take the strain off from the tail-screw when a direct pull longitudinally of the jaws is given to the tool. It also relates to other minor improvements.

My improvements are adapted to hand and bench vises of all sizes, and also to brace-wrenches.

In the drawings which serve to illustrate my invention, Figure 1 is a side elevation, partly in section, showing the adaptation of my improvements to a brace-wrench. Fig. 2 is a section of same on line 2 2 in Fig. 1. Figs. 3 and 4 are respectively detached sectional views taken on lines 3 and 4 in Fig. 1. Fig. 5 is a cross-section through the nut and jaw, taken on line 5 5 in Fig. 2. Fig. 6 shows the spherical nut detached. Fig. 7 is a detached sectional view of the tail of the jaw. Fig. 8 is a side elevation, showing the adaptation of my improvements to a hand-vise, and Fig. 9 is a similar view, showing my improvements applied to a large bench-vise. Fig. 9^a is a detached sectional view taken on line 9^a 9^a in Fig. 9, and Fig. 9^b is a sectional view of the nut. Fig. 10 illustrates a modification which will be described hereinafter, and Fig. 10^a is a side or edge view of same.

In my former patent I illustrated and described a tool of this character in which the two jaws were closed together simultaneously on the object to be grasped by means of a right-and-left-hand screw, and the tails of the jaws were spread by means of a similar screw. Rocking nuts were also employed in order to permit the jaws to shift out of parallelism or

to stand at an angle with each other. These features were all shown in my patent of May 18, 1880, No. 227,686, and I do not claim them herein.

Referring now most particularly to Figs. 1 to 7, A A are the jaws; B, a tubular central stock; C C, the guides on said stock between which the jaws play; D, the head-screw, and E the tail-screw. All of these parts are essentially old. The head and tail screws do not engage screw-threads in the jaws directly, but in nuts *a a* (see Figs. 1, 2, 5, and 6) set in recesses in the jaws. In my former patent these nuts were made in the form of a semi-cylinder, and were retained in place by pins or screws which passed through the sides of the jaws into the axes of the cylinders. The recess required to receive this form of nut was quite difficult to form in the jaw, and required special tools. To obviate this difficulty I have designed the nut herein shown, and which I will now describe.

My improved nut is spherical in form, with the hole for the screw bored diametrically through it. The recess in the jaw (see Fig. 7) is also made spherical to fit the nut, and this may be formed or dressed out by means of an ordinary rose-drill or cherry.

In order to prevent the nut from turning in the jaw and to retain it in place, several means may be adopted. The preferred form is that illustrated in Figs. 1 to 6. I remove a portion of the exterior face of the nut and form inclined flattened faces *b b* on its opposite sides. The sides of the jaw at the recess are quite thin, and when the nut is properly set in the recess these thin sides are set in, as at *c*, (see Figs. 2 and 5,) so as to take over the flattened faces *b* on the nut, and thus hold it in place. When the jaws are spread at the head or tail so as to be thrown out of parallelism, the screws D and E must approach each other slightly, although they still remain parallel. To permit this movement and yet mount the screws steadily in the stock B, I provide the means I will now describe. The stock is made tubular, and one screw, the head-screw D in Fig. 1, passes through a slotted aperture in the same, as best shown in Figs. 1 and 3. In the body of the screw is formed a circumferential groove, and the reduced journal thus formed engages a fork, *d*, in the end of a cylin-

drical piston, F, which fits snugly, but is free to slide in the bore of the stock. To maintain the engagement of the fork with the screw, the prongs of the same are pinched together slightly (see Fig. 4) after the fork is in place. In Fig. 9 I have shown the piston F applied to the tail-screw E.

I will now describe the means for steadying the tails of the jaws in order to prevent torsion, to take the strain off the tail-screw, and at the same time permit the jaws to be thrown out of parallelism at will.

Referring to Figs. 1, 2, and 7, G is a tail-piece formed with or secured to the stock B, and having a T-shaped cross-section, as shown in Fig. 2. The tail of the jaw is cross-slotted to fit over and slide on the bearing *e* and provided with rounded lugs *ff* to take under the overhanging flanges of *e*. The broad lateral bearing of the jaws on *e* prevents any torsion of the jaws; the lugs *f* take under the overhanging flanges of *e* when any longitudinal strain is brought on the jaws, and thus relieve the screw E; and the convex shape of the roof of the cross-slot in the tail of the jaw, as shown at *g* in Fig. 7, allows the jaws to be thrown out of parallelism to a limited but sufficient extent. It is not absolutely necessary to make the roof *g* convex. It might be cut away so as to simply provide a clearance; but I prefer it should have a support on the crown or top of the tail-piece G. The hand-vise shown in Fig. 8 differs from the tool shown in Fig. 1 only in the stock B being removed, leaving only a stump, B', to serve as a bearing for the tail-screw. This vise is especially well suited for putting up telegraph-wires. For such purposes the vise is clamped on the wire, and the latter is strained by means of a strap attached to the bail *h*. In this case the strain would be thrown on the tail-screw if it were not for the engagement of the lugs *f* under the flanges on the tail-piece.

Figs. 9, 9^a, and 9^b illustrate the application of my improvements to a larger bench-vise, and a slight modification of the spherical nut *a*. This application differs from that already described only in the following particulars—namely: The stock B is secured to the bench H through the medium of the guides C C and the tail-piece G, the lugs *f* are omitted from the slots in the tails of the jaws, and the means employed for retaining the nuts in place differs slightly from that before described. In this construction I omit the beveled faces *b* and recess the nut on both sides in its axis of oscillation. When it is in place, I indent or set in the thin faces of the jaw with a punch, until the metal of the same enters into the recesses in the nut. These retain the nut in place and prevent it from turning with the screw. Either of these modes of retaining the nut in place may be employed, and for all forms of tools.

In Figs. 9 and 9^b I have lettered the recess in the nut *b'*, and the point where the metal of the jaw is set into it *c'*.

In Fig. 6 I have shown four flattened faces, *b*, on the nut, and either pair may be employed; but one pair will usually suffice.

The tail-piece G in Fig. 9 serves as an anvil or support for the jaws to receive the impact of the blows struck on any object held in the vise. This relieves screw E of the strain.

Figs. 10 and 10^a illustrate a modification of my tail-piece G. In this construction *e'* is a cylindrical rod secured in a cross-bore in the tail-piece, or formed in one piece with the latter. This rod passes through holes in the tails of the jaws, as clearly shown, and serves both to prevent torsion and to take the strain off from the tail-screw. To permit the jaws to swing out of parallelism, the bores in the jaws are slightly flared above and below, but not at the sides. Other devices of a character similar to these, and which will prevent the torsion of the jaws, may be employed. In fact, it is immaterial, except for economy in the manufacture, whether the jaw takes over the tail-piece or the tail-piece takes over a part of the jaw. I prefer the former construction.

Having thus described my invention, I wish it understood that I do not herein claim, broadly, every form of oscillating or rocking nut for a tool of this character; but

What I do claim is—

1. A tool for grasping and holding articles, having jaws provided with spherical recesses to receive the nuts for the screws, and spherical nuts made to fit into said recesses, bored diametrically to receive the screws and secured in their places by the means substantially as set forth—that is to say, portions of the convex surfaces of the nuts are cut away on opposite sides, and portions of the lateral faces of the jaws set into the recesses thus formed—as described.

2. In a tool for grasping and holding articles, the jaws provided with spherical recesses to receive the nuts, in combination with the screws and the spherical nuts *a*, provided with diametrical bores to receive the screws, and with flattened and beveled faces, *b*, portions of the lateral faces of the jaw being set or bent in, as shown, over the faces *b*, for the purposes set forth.

3. A tool for grasping and holding articles, provided with a tubular stock, B, a forked piston, F, and a screw provided with a circumferential groove to engage said fork, and all arranged to operate substantially as and for the purposes set forth.

4. As a means for preventing the torsion of the jaws of a tool for grasping and holding articles, a tail-piece rigidly connected with the stock or part in which the tail-screw is mounted, and arranged to engage the tails of the jaws and provide a guide therefor in the movement of the jaws to and from each other, substantially as set forth.

5. As a means for preventing the torsion of the jaws A of the tool, and also for relieving the strain on the tail-screw, the tail-piece

G, connected rigidly with the stock or part in which the tail-screw is mounted, and provided with a laterally-flanged bearing, *e*, and the jaw provided with cross-slots to engage said bearing, and with lugs *f* to take under the projecting flanges of the same, substantially as set forth.

6. The combination, in a tool for grasping and holding articles, of the jaws, the head and tail screws, and suitable rocking nuts, of the tubular stock B, the forked piston F, and

the tail-piece G, the said tail-piece constructed substantially as described, and the tails of the jaws constructed to engage the same, substantially as and for the purposes set forth. 15

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH GOODRICH.

Witnesses:

HENRY CONNETT,
GEO. BAINTON.