

No. 816,162.

PATENTED MAR. 27, 1906.

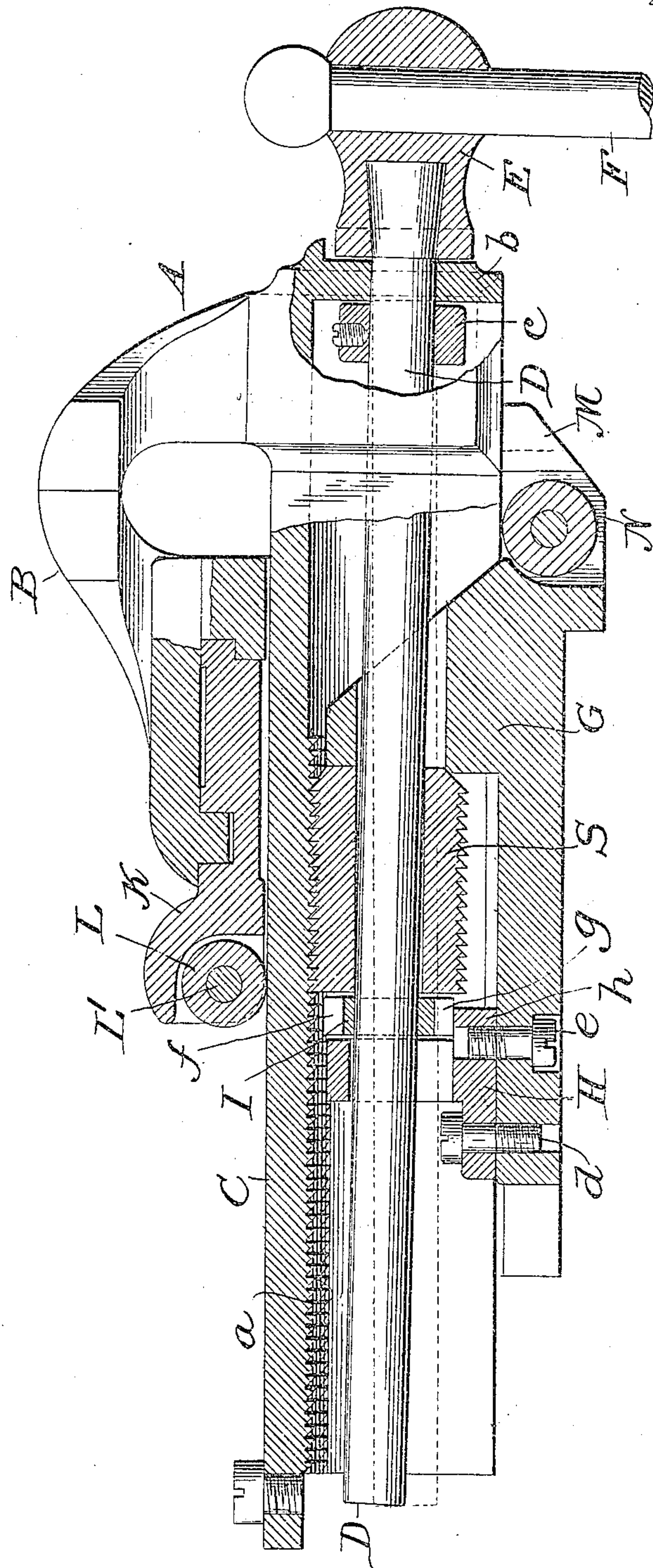
C. HANIMANN.

BENCH VISE.

APPLICATION FILED MAY 8, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:  
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L. H. Grote.

INVENTOR  
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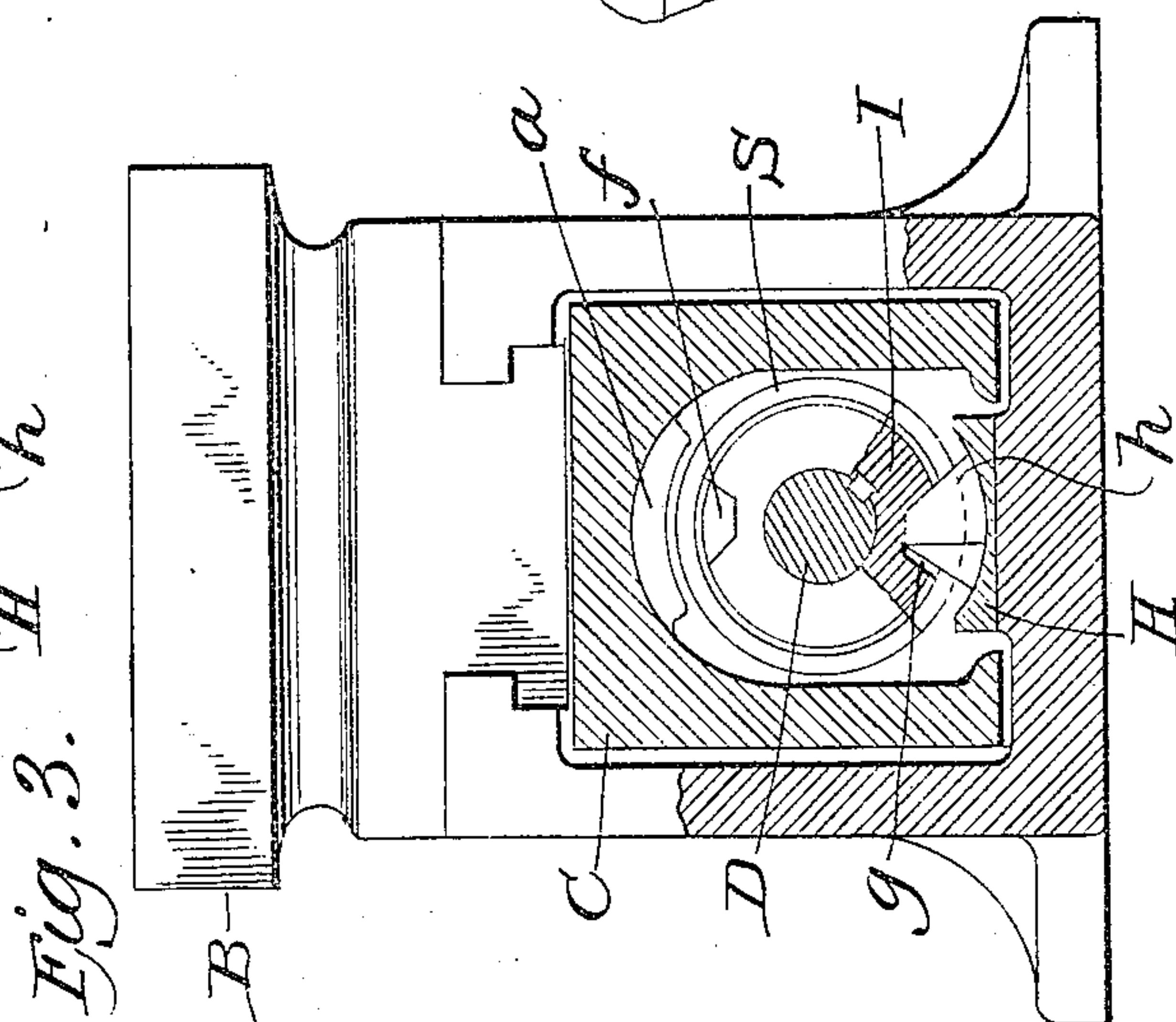
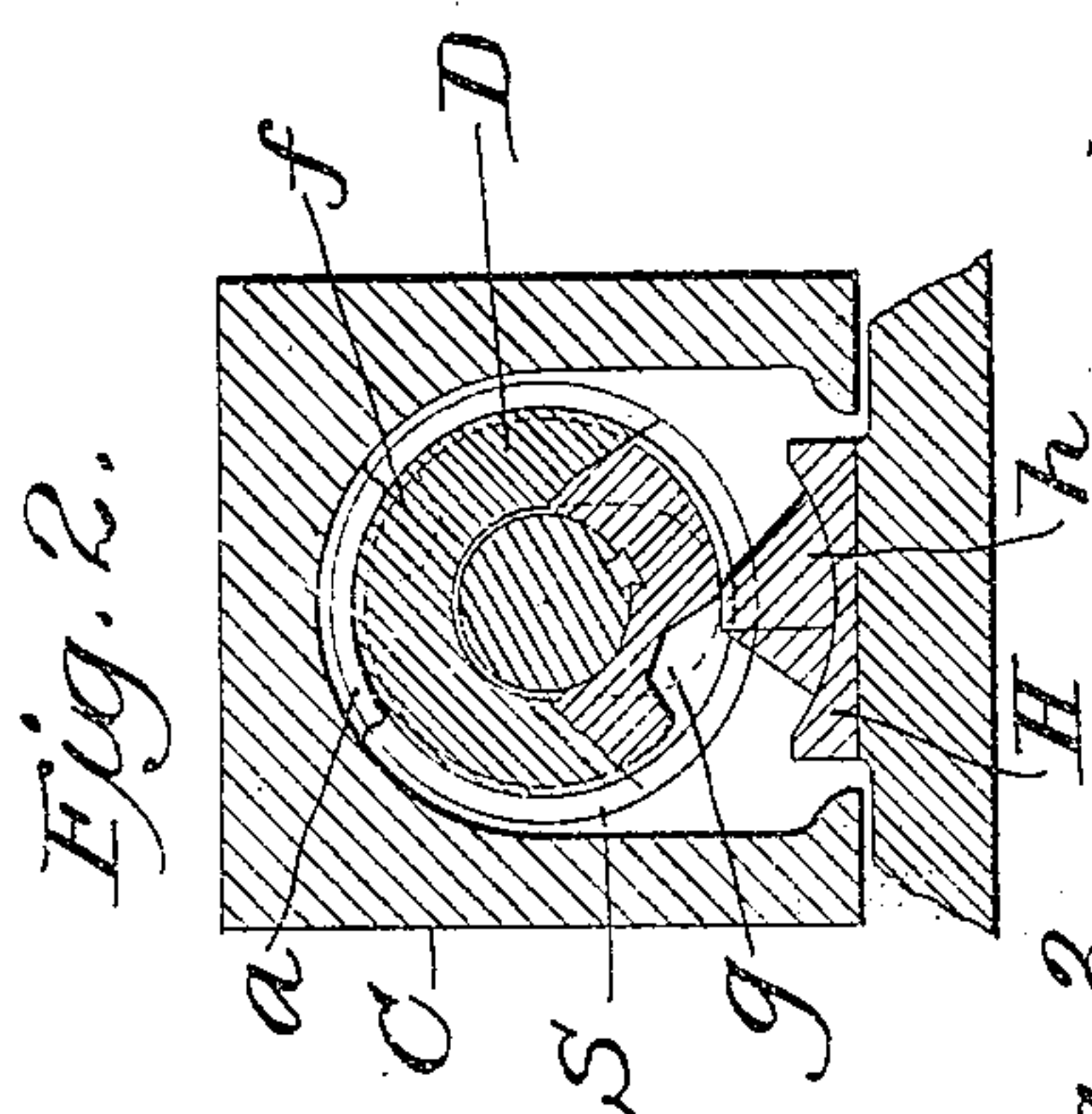
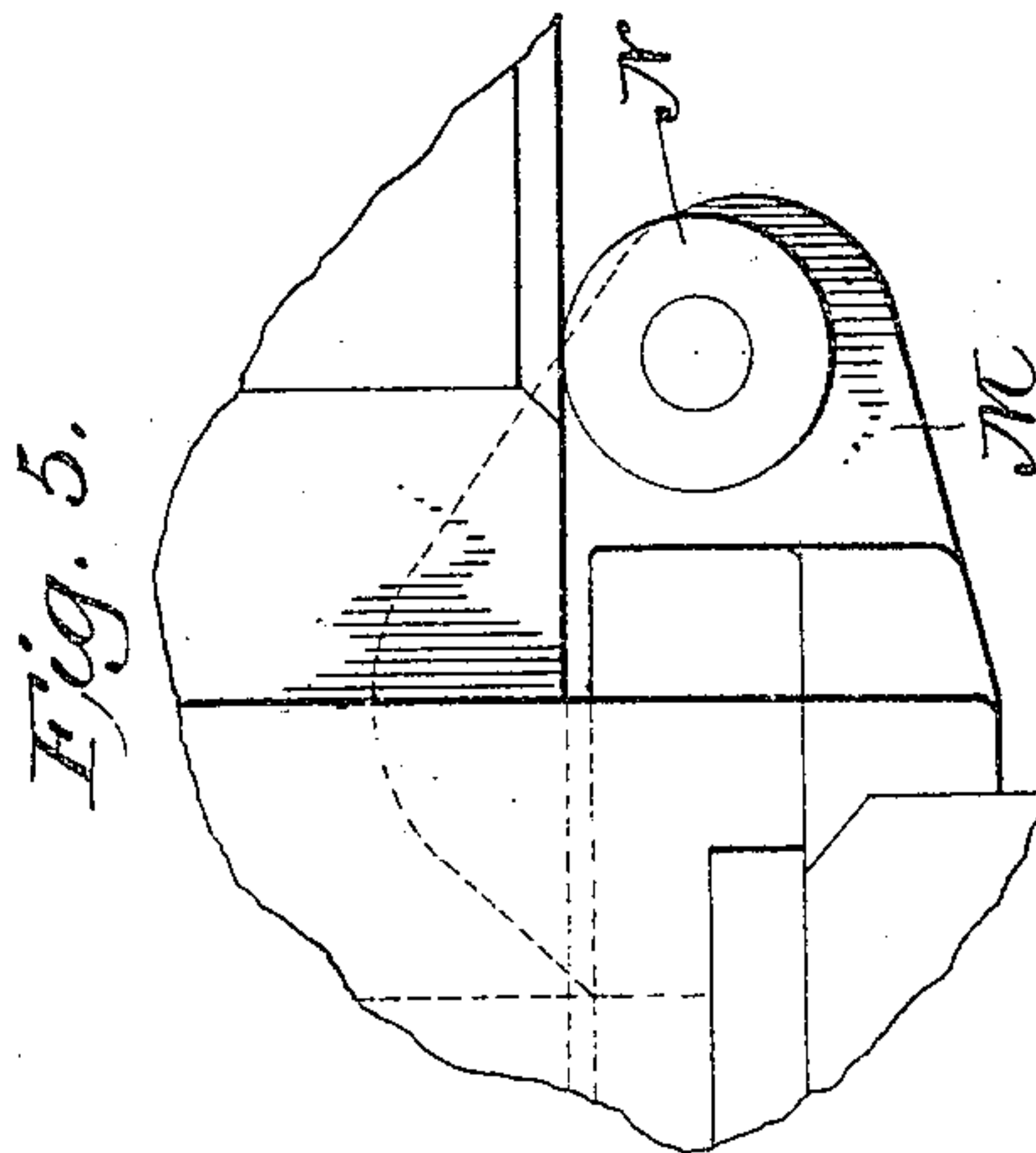
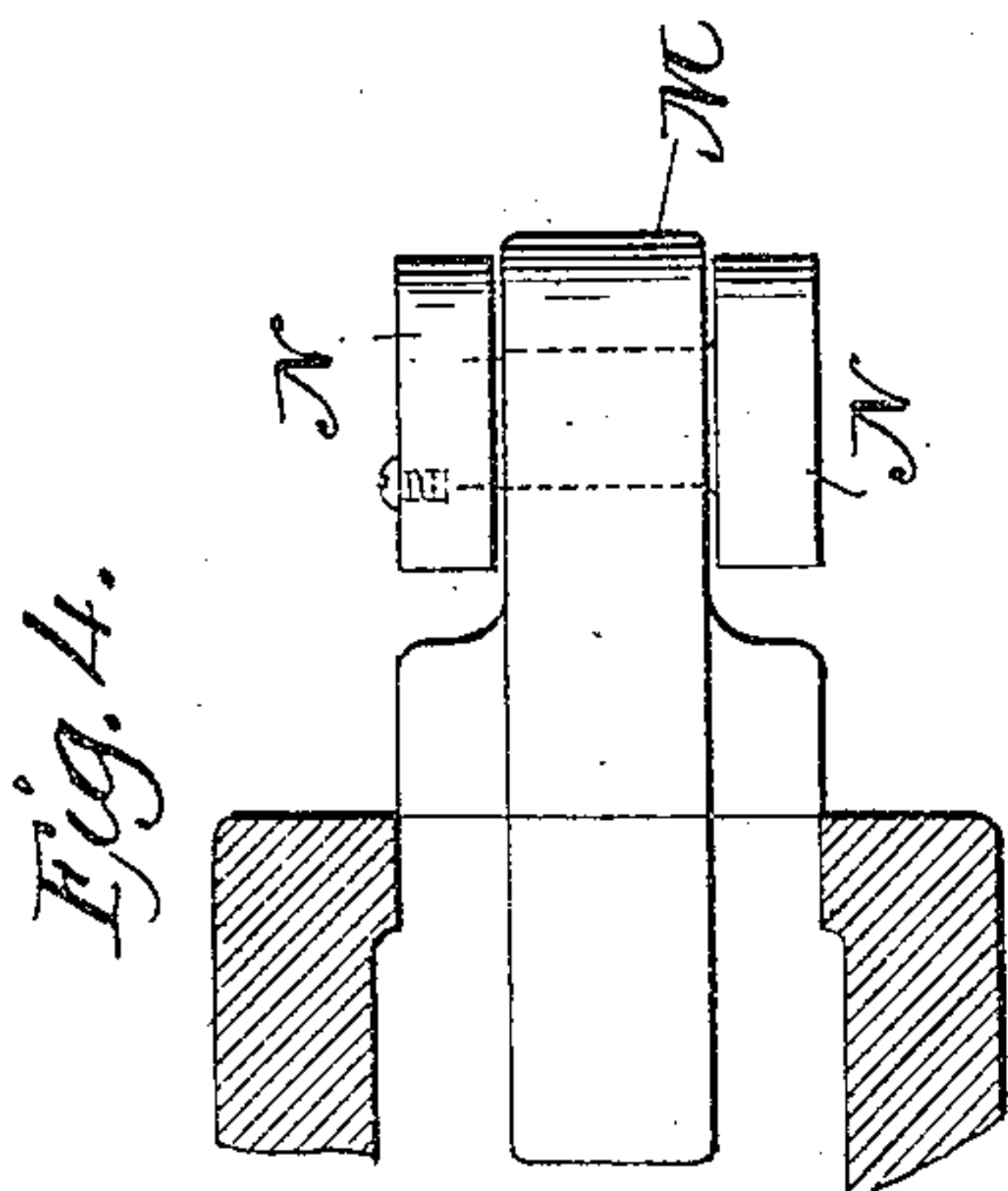
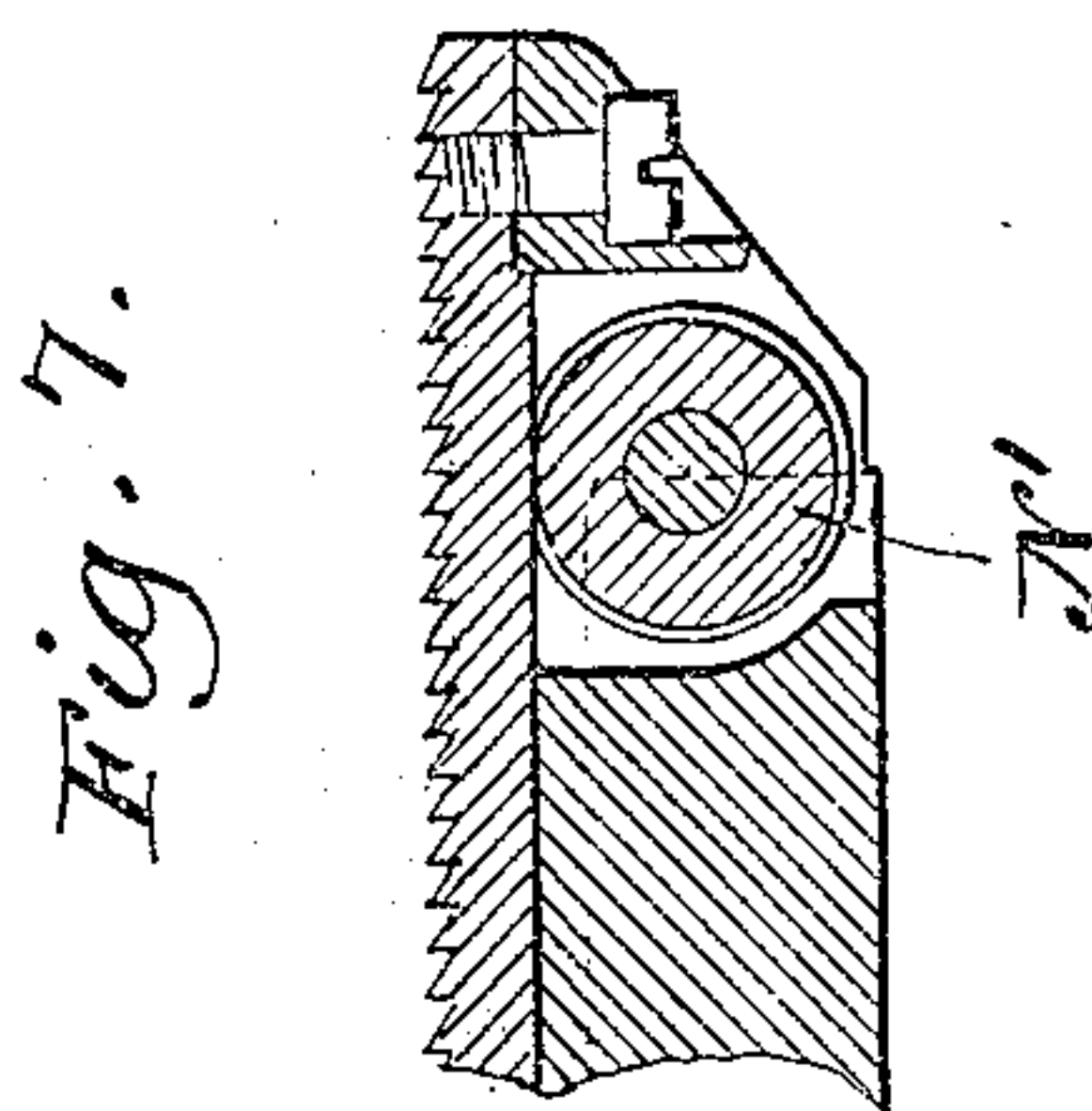
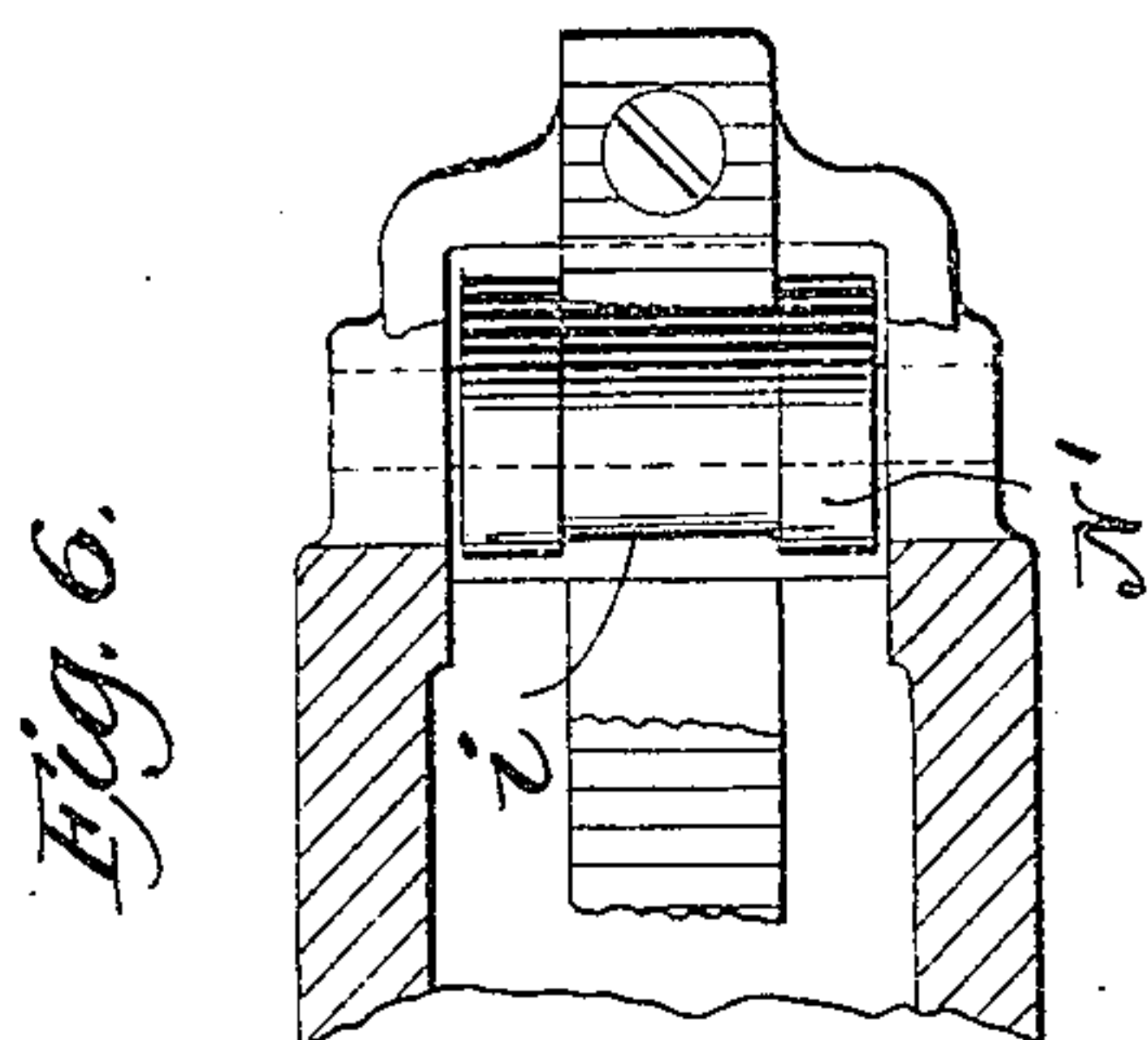
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2 SHEETS—SHEET 2.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## BENCH-VISE.

No. 816,162.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed May 8, 1905. Serial No. 259,317.

*To all whom it may concern:*

Be it known that I, CHARLES HANIMANN, a citizen of the United States, residing at Flushing, in the county of Queens and State of New York, have invented certain new and useful Improvements in Bench-Vises, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, and to the reference characters marked thereon.

My present invention has relation to vises such as are employed by mechanics and others and intended to hold articles or materials while they are being worked upon. These vises are usually attached to some fixed support, as a bench or table, and they are ordinarily known as "bench-vises." Of these bench-vises there are many varieties suitable for holding different kinds of work and operative in different ways; and it is chiefly to a variety now come to be commonly known as "quick-action" or "rapid-transit" vises that my invention is principally applicable, although some of the features are equally applicable in connection with other varieties, as will hereinafter appear.

The quick-action or rapid-transit vises are such as permit of the movable vise-head being adjusted rapidly back and forth without the necessity of depending upon the screw, or, in other words, independently of the screw, when the latter is out of engagement with the means by or through which it causes the head to forcibly move back and forth or when the mechanism by which the vise is tightened against the work or upon the work is out of working engagement.

The principal object of my present invention is to provide or produce a quick-action or rapid-transit bench-vise wherein the grip of the screw is effected or relieved by a simple and comparatively slight turning of the screw-shaft itself and wherein the parts are few and simple and easy of construction and easy to mount in place and wherein the working parts are durable and substantial, reliable and efficient in action, and not liable to get out of order.

A subordinate object of this invention is to provide a reliable and efficient form of anti-friction-roller at the front part of the vise for the slide-bar to ride upon.

To accomplish the foregoing objects and to secure other and further advantages in the

matters of construction, operation, application, and use, my improvements involve certain novel and useful peculiarities of construction, relative arrangements or combinations of parts, and principles of operation, all of which will be herein first fully described and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, I have shown my improvements as applied in connection with a particular form of bench-vise which is ordinarily called a "smith's vise" or "metal-workers' vise;" but it should be understood that this selection is only for convenience of illustration and that my improvements are equally applicable in connection with any other variety of bench-vise.

Figure 1 is a vertical view, partly in section and partly in elevation, on a plane through the axis of the shaft or vise-screw, the working parts being shown in the position which they occupy when clamping any piece of work or when the movable vise-head is forced up close against the stationary head. Fig. 2 is a cross-section showing the screw-shaft and the operating-collar thereon in raised position to cause the screw to engage with its cooperating rack. Fig. 3 is a cross-section and elevation showing the screw-shaft and the screw thereon in lowered position or out of engagement with the screw-rack and showing also one of the vise-heads. Fig. 4 is a horizontal view, and Fig. 5 a corresponding side elevation, showing one manner of mounting the lower anti-friction-roller in connection with the snout or front piece of the vise. Fig. 6 is a partial plan and section, and Fig. 7 a vertical view, partly in section and partly in elevation, showing the manner of mounting the front roller for use in connection with a vise employing a rack in the lower part of the slide-bar.

In all the figures like letters of reference wherever they occur indicate corresponding parts.

In my application for patent filed February 21, 1905, Serial No. 246,654, I have shown one form of rapid-transit vise.

According to my present invention I incline the screw-shaft down at one end in order to disengage the screw from its rack, so as to free the slide-bar in order that it and the head carried thereby may be freely moved back and forth, and in this present invention



instead of cutting or recessing the screw to operate in connection with the adjacent abutment I supply the shaft with a separate piece or collar which is recessed and which operates in connection with the abutment for the purpose of lowering or raising the screw-shaft. By this means I obviate the necessity of recessing the screw.

A represents the front or movable head of the vise, which is intended to travel back and forth and to operate in conjunction with the other head B, the first-named head being mounted upon or connected with the slide-bar and the second head being mounted upon or connected with the body of the vise. In the particular form shown in Fig. 1 the head B is made movable with respect to the body, so as to enable the vise to conveniently clamp articles or work having inclined sides; but this feature is not at all essential.

C represents the slide-bar, the same carrying the screw-shaft D and being provided on its upper inner face with a suitable screw-rack, (represented at *a*.)

S is a screw connected with the screw-shaft so that it must turn therewith, but so that the shaft may move back and forth through it, the two parts being suitably keyed together for this purpose, substantially as indicated in Figs. 2 and 3. The shaft D passes through an opening in the front wall *b* of the slide-bar and is supplied on the exterior of this wall with a substantial head E, through which a suitable lever F is passed, and on the inner side of the wall *b* the shaft is supplied with a collar *c*. The opening in the front wall *b* is large enough to permit a tilting movement of the other end of the shaft, sufficient space between the head E and the front wall and between the collar *c* and the front wall being left so that the necessary inclining movements of the shaft may take place without interference at this portion of the vise.

The vise is intended to be secured or mounted upon a bench or other support in any suitable way and by any suitable means. At G on the base of the vise or applied in connection therewith is an abutment of ample strength to withstand the strains brought against it, the same being perforated to permit the passage of the vise-screw through it and to permit the latter to be inclined as required by the conditions of my present invention. The front end of the screw bears against the abutment G when the screw is tightened or turned in the direction for tightening the vise.

At H is another abutment, the same being removably applied on the base or in the vise-body, as by suitable screws *d e*. The two abutments are separated by a distance sufficient to accommodate the screw and the operating-collar and to permit their necessary movements, the abutment H being perforated

so as to permit the screw-shaft to be tilted or inclined without interference.

I is a collar applied on the screw-shaft independently of the screw, but keyed in connection with the shaft, so as to be turned when the latter is turned and permit the shaft to slide back and forth through it when required. This collar is notched or recessed, as at *f* and *g*, preferably at two points opposite each other, although one notch might answer the purpose and more than two of these notches may be employed, if so desired. These notches have inclined faces of greater or less degree, so that they will ride easily upon a projecting part of the abutment H, (represented at *h*,) and thereby cause the collar and the end of the shaft to be raised or permit them to drop down, according to the direction in which the shaft may be turned.

From the construction so far described it will appear that when the shaft is turned in the direction to tighten the vise the collar will ride up on the projection *h*, and thus carry the screw-shaft to its uppermost position and the screw into engagement with its cooperating rack, and a further turning of the screw will then only further tighten the vise-jaws. When the screw-shaft is turned in the opposite direction, bringing one of the notches in the collar I over the projection *h*, the collar and the end of the shaft will drop down, as indicated by the dotted lines in Fig. 1, and this inclination or dropping down of one end of the screw-shaft will carry the screw out of engagement with the screw-rack. Then the slide-bar and the vise-head carried by it may be moved back and forth without the necessity of turning the shaft or after the manner of the rapid-transit or quick-action vises heretofore referred to.

In order that the screw may be firmly brought into working position when the shaft is turned in the proper direction, it is by preference slightly beveled at one end and the adjacent abutment slightly recessed to receive the beveled portion. When the screw inclines down, it frees itself from the recess in the abutment, and thereby effectually clears itself from the screw-rack, so that the rapid movements of the slide-bar and the vise-head may take place without interference.

When a piece of work is clamped between the vise-jaws of any bench-vise having a slide-bar, the tendency is to force the forward end of the slide-bar down and the other end up, producing a frictional bearing on the contiguous parts proportionate with the power with which the clamping is effected. To overcome this disadvantage at the rear part of the vise, I extend the vise-body sufficiently for the purpose and in the extended part mount a roller L upon a roller-shaft, as L', the latter being sustained in the vise-body in any suitable way. The slide-bar bears on its upper surface against this roller



L, which operates as an antifriction-roller, and notwithstanding any pressure upon it it will permit the bar to slide easily in either direction. The rear of the vise-body may well  
 5 be extended so as to cover the roller L, thereby preventing contact of clippings or dust with the roller which might interfere with its smooth action. The antifriction-roller at this point may be employed alone in the vise.

10 At the front of the vise-body and at a part below the slide-bar is a piece, as at M, called the "snout." This snout affords a convenient seat for another antifriction-roller, as at N, on which latter the slide-bar bears and  
 15 moves. For application at this point the roller is conveniently made in two parts, as shown in Fig. 4, one part carrying an arbor which passes through the snout and the other part being connected therewith on the opposite side of the snout. The lower margins of the slide-bar ride upon the roller N, and thus the under bearing of the bar is relieved of friction and the bar may be easily moved back and forth.

25 When the vise with one or both rollers in place is tightened, the power applied to the screw-shaft may be almost entirely employed for clamping, as the necessity for overcoming the binding action on the slide-bar is obviated.

30 In some forms of vises a rack is employed on the lower part of the slide-bar, as when the engagement between the screw-shaft and the slide-bar is effected by a dog or pawl engaging with such a rack. Such a construction  
 35 does not leave the lower portion of the slide-bar open, and in such a construction I may make the antifriction-roller at the front (represented at N' in Figs. 6 and 7) of a single piece slightly recessed at its central part, as  
 40 at i, to permit the rack to ride over it without touching, the lower faces of the slide-bar bearing upon the roller outside the recessed portion.

The antifriction-rollers, of whatever form  
 45 they may be, may be employed either at the front of the vise or at the back, or in both situations, as may be preferred. In either situation the roller facilitates the rapid movements of the slide-bar, especially in the larger  
 50 and heavier forms of vises, as will be readily understood.

The snout M is extended, as indicated by the dotted lines in Fig. 5, so as to reach up into the interior of the slide-bar, thus making  
 55 the snout amply strong to withstand any strains which may be brought upon it by clamping the vise or by working upon the piece or material held by the vise.

Being constructed and arranged substantially in accordance with the foregoing explanations, the improvements will be found to answer all the purposes or objects of the invention hereinbefore alluded to.

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

1. In a bench-vise having jaws, the combination with the slide-bar carrying the movable head or jaw, of a screw-rack located in said bar and movable therewith, a screw for  
 70 engagement with the rack, and a shaft adjustable through and adapted to turn the screw, the screw and its shaft being arranged to be inclined by turning the shaft and the screw  
 75 thereby thrown into or out of engagement with the movable rack, substantially in the manner and for the purposes set forth.

2. In a bench-vise having jaws, the combination with the screw-shaft and screw mounted and keyed to each other so that one  
 80 may move within the other, the shaft carrying a notched collar separate from the screw, and a projection arranged to elevate the said collar or permit it to drop, substantially as and for the purposes set forth.

3. The combination with the vise-jaws, a screw, and a collar notched as explained, of the shaft for turning said screw and collar and made movable therein, and an abutment  
 90 connected with the vise-body and arranged to permit the screw and its shaft to be inclined, substantially as and for the purposes set forth.

4. The combination of the vise-jaws, the slide-bar, the screw, the screw-rack, the separate collar, the screw-shaft moving longitudinally through the screw and through said  
 95 collar, and the abutment, the screw being provided with a beveled projection on one end and the adjacent abutment being recessed to receive this projection, the parts  
 100 being combined and arranged for operation, substantially as shown and described.

5. In a bench-vise having jaws, the combination with the slide-bar, of a screw-shaft  
 105 held at one portion in the front wall of the slide-bar, the other end being arranged to rise and fall, the shaft carrying a vise-screw and the slide-bar carrying a rack, and means for causing the screw-shaft to be inclined,  
 110 substantially as and for the purposes set forth.

6. In a vise having jaws, the combination with the vise-body and the slide-bar, of the snout extending up and into the slide-bar,  
 115 and an antifriction-roller composed of two bearing parts united by an arbor of less diameter, the arbor being seated in the snout, substantially as shown and described.

In testimony whereof I have signed my  
 120 name to this specification in the presence of two subscribing witnesses.

CHARLES HANIMANN.

Witnesses:

GEO. A. MARSHALL,  
 WORTH OSGOOD.