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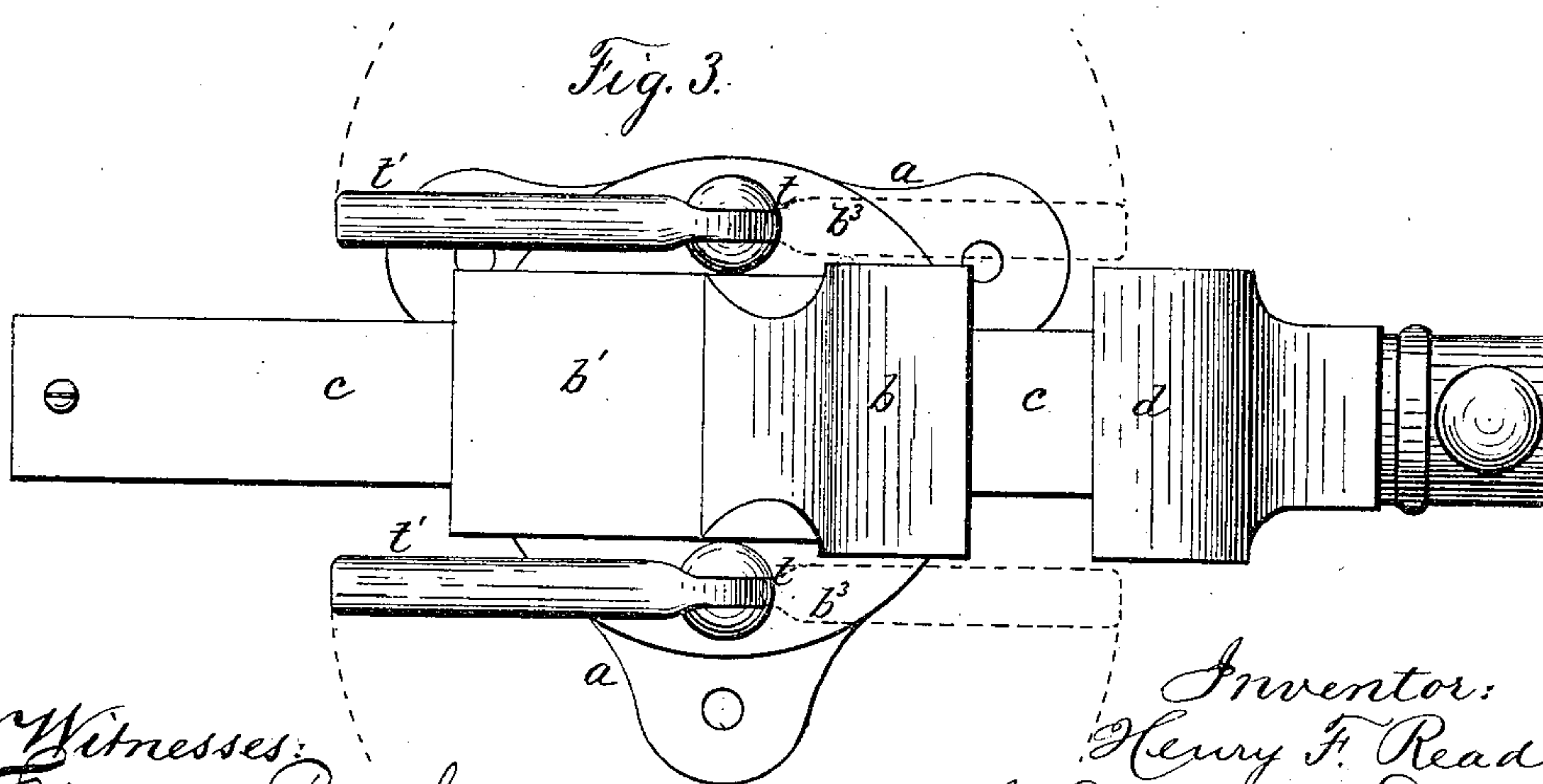
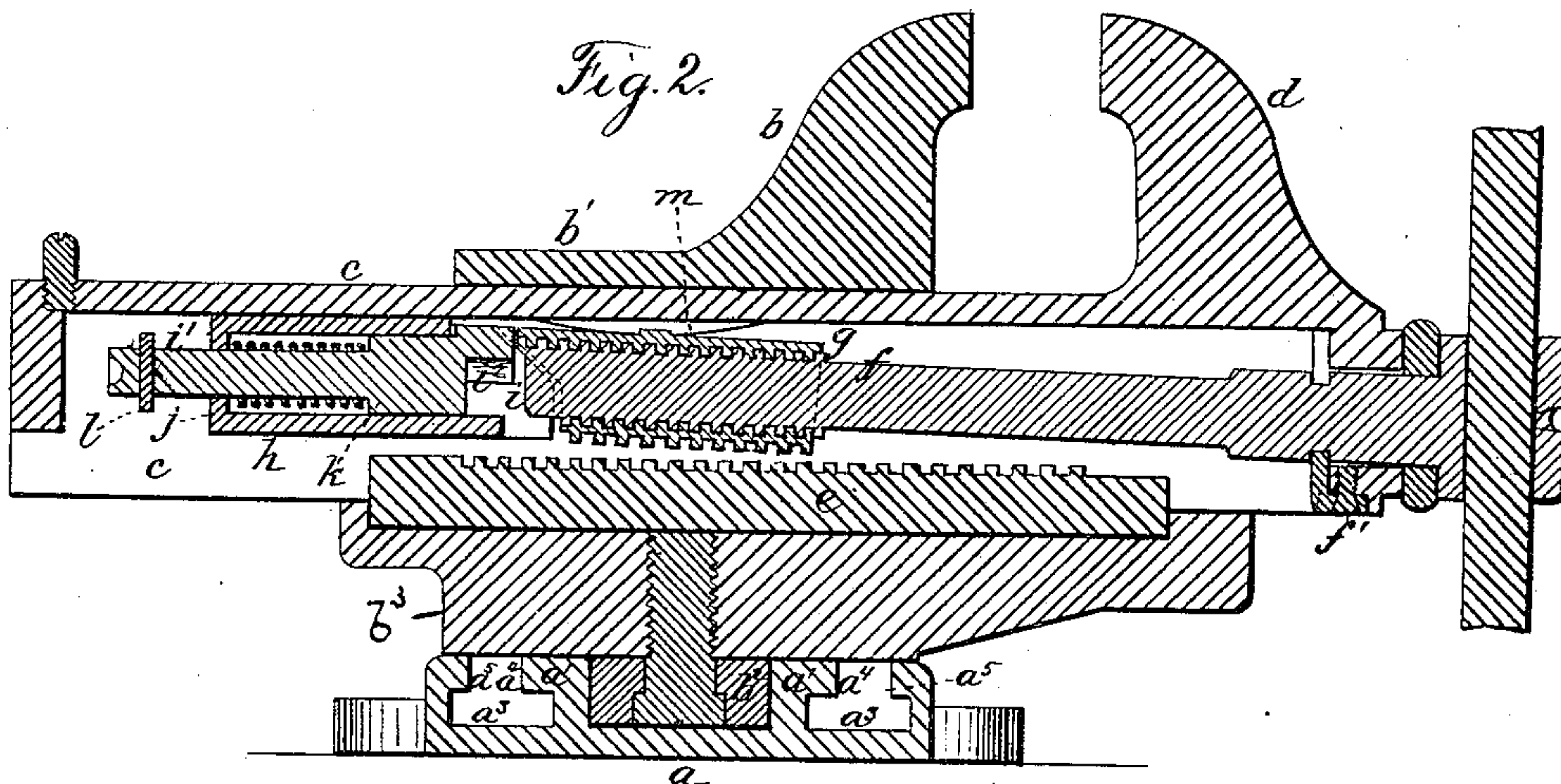
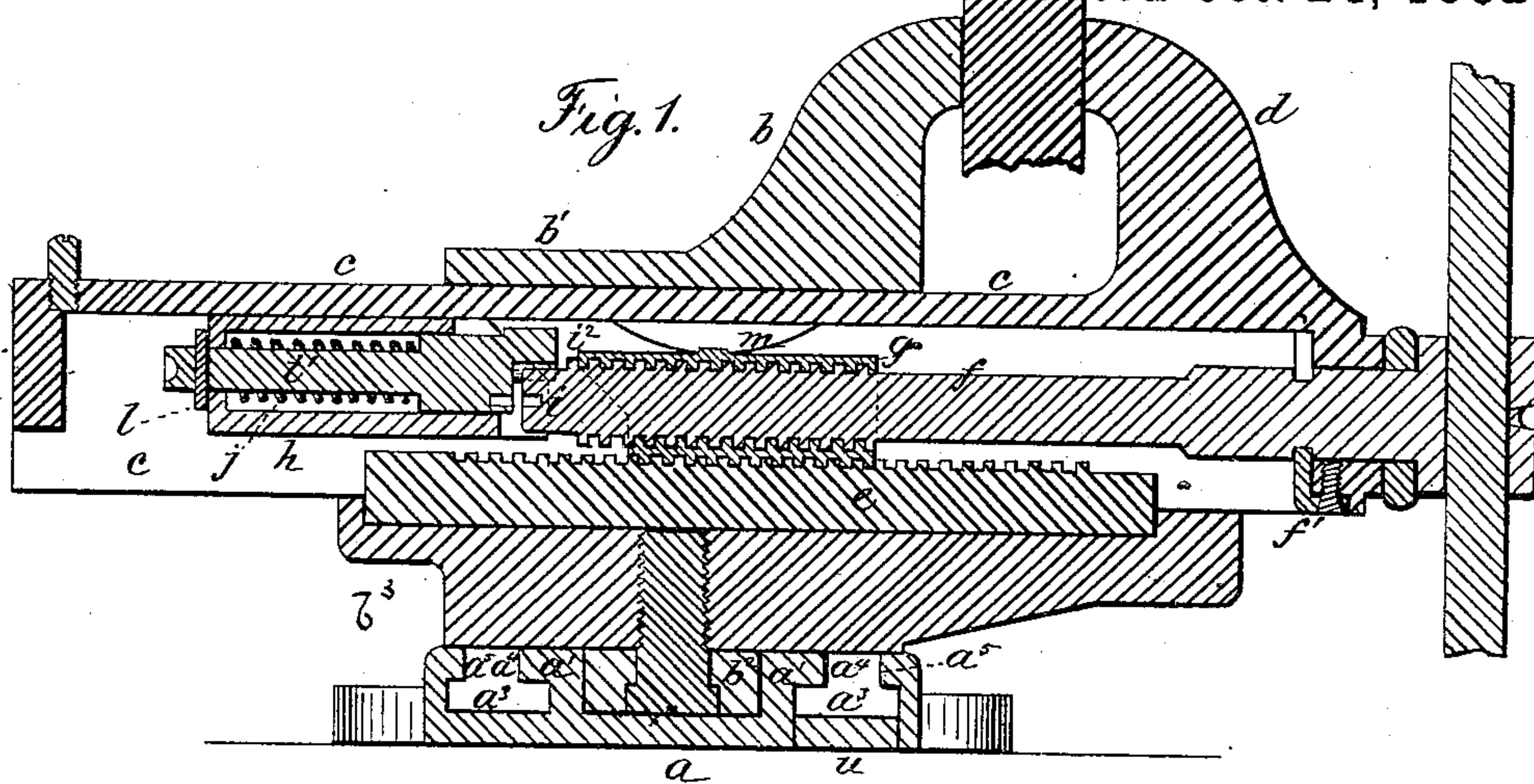
2 Sheets—Sheet 1.

H. F. READ.

WISE.

No. 266,522.

Patented Oct. 24, 1882.



Witnesses:
Edmund Broahag
Howell Bartle

Inventor:
Henry F. Read
by Johnson & Johnson
Attys

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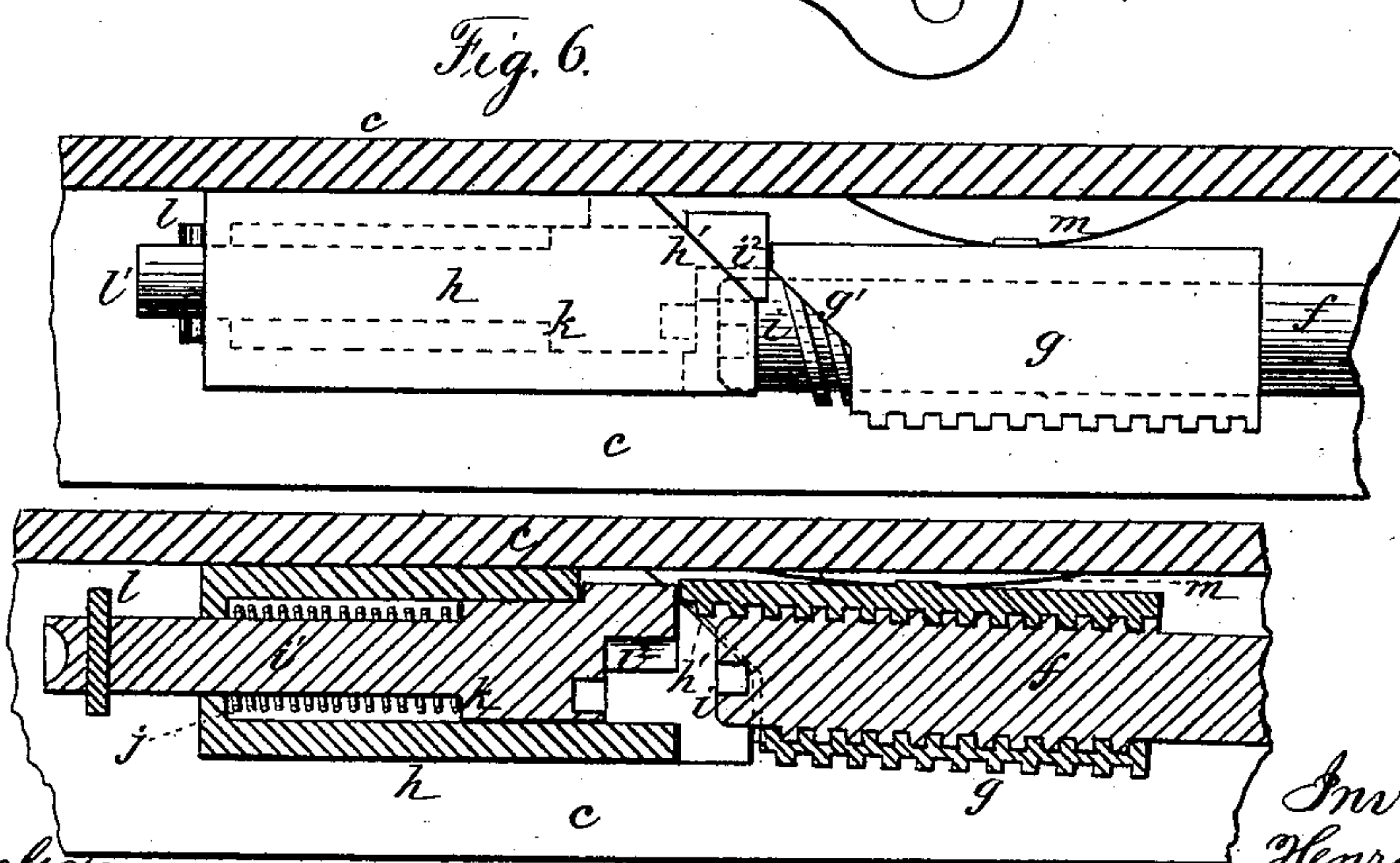
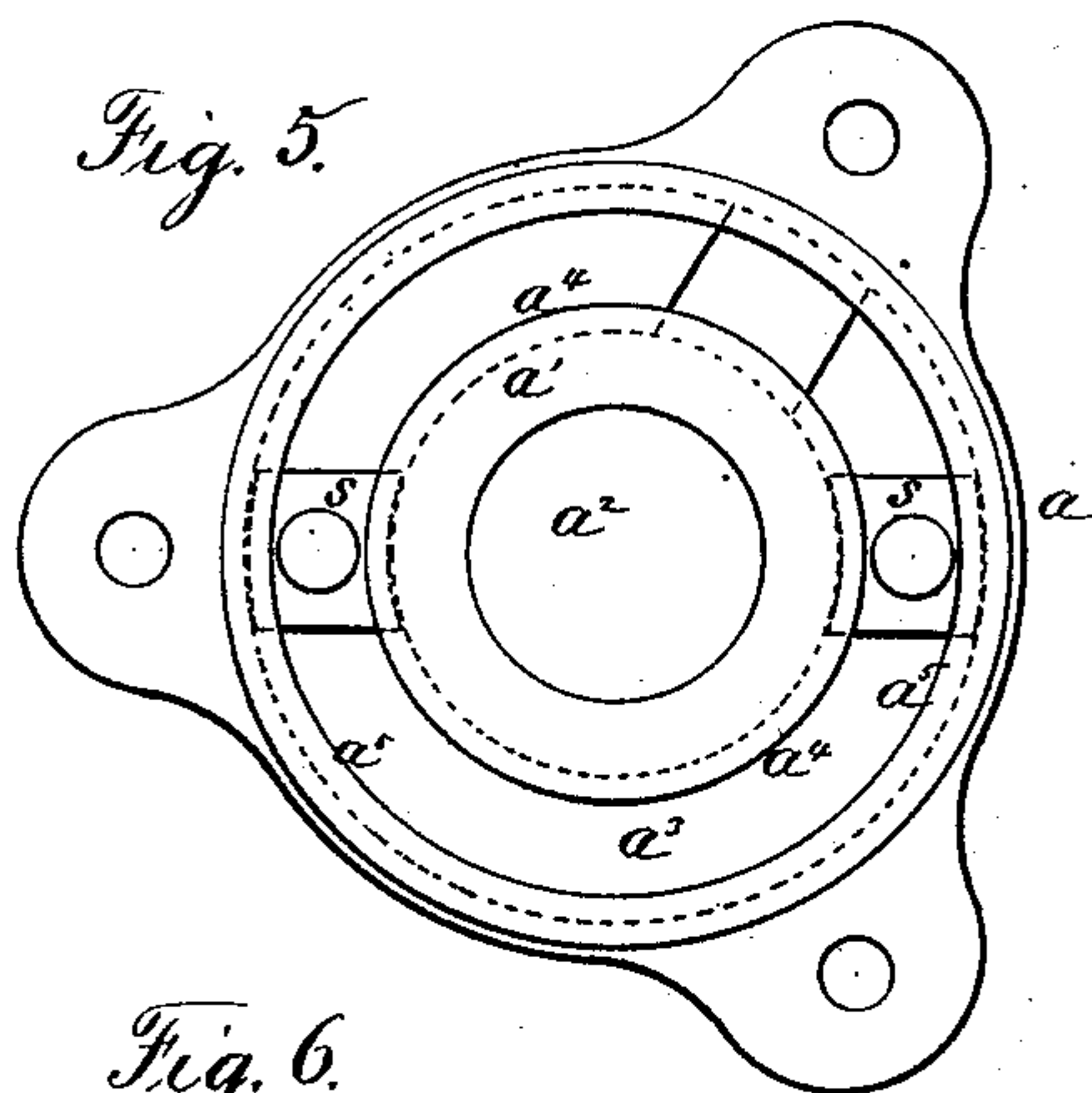
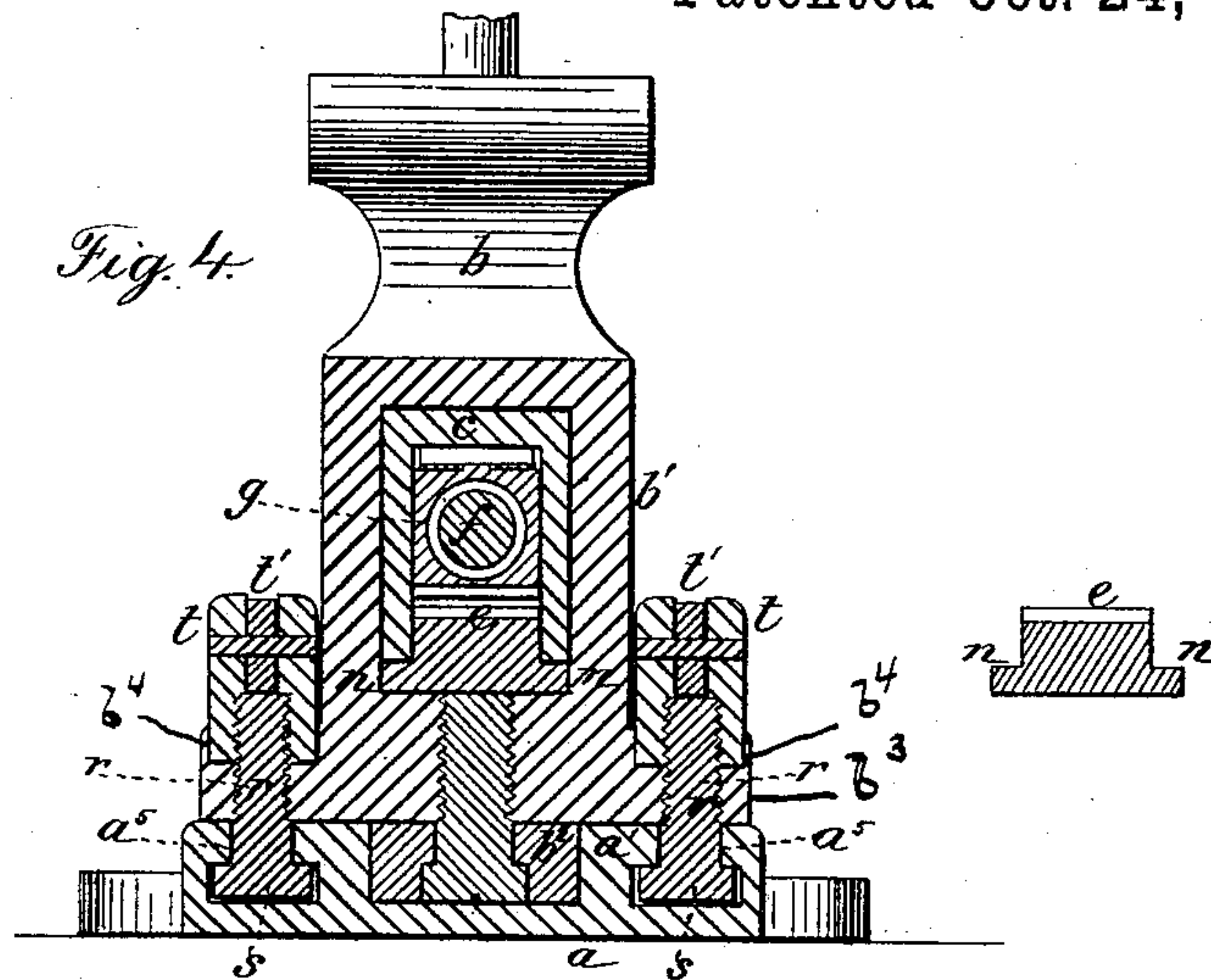
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UNITED STATES PATENT OFFICE.

HENRY F. READ, OF BROOKLYN, NEW YORK, ASSIGNOR TO READ, GLEASON & READ, OF SAME PLACE.

WISE.

SPECIFICATION forming part of Letters Patent No. 266,522, dated October 24, 1882.

Application filed April 13, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY FRANKLIN READ, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented new and useful Improvements in Vises, of which the following is a specification.

My invention relates to improvements in vises in which the movable jaw is adapted for parallel movement in relation to the fixed jaw, with a screw working in a sliding rack-nut automatically engaged with and disengaged from a rack of the fixed jaw by the action of the screw, and inclines to allow the movable jaw to be freed from control of the screw, so that it may be moved in and out by hand, or be controlled by the screw to firmly grasp the article between the jaws.

The object of my improvement is to render the vise more effective and certain under the action of the screw, to provide a more effective means for clamping the swiveling vise to the bench, and to lessen the expense of construction. I use a sliding locking-nut and a fixed rack, both having square teeth to give the required strength to resist the powerful action of the screw in gripping the article between the jaws, in connection with a sliding locking device adapted to operate upon the unthreaded end of the screw to hold the sliding rack-nut carried by said screw in the teeth of the fixed rack. The sliding locking device is moved from above the screw by the movement of the rack-nut and the action of the inclines to free the rack-nut from the fixed rack. This construction gives the advantage of having the locking parts separate, so that they can be secured within the movable jaw-bar in position to be operated by the rack-nut, without regard to any specific length of screw, or any special construction of the interior of the movable jaw-bar, with inclines to suit a certain movement of the rack-nut, and inclines to effect its engagement with and disengagement from the fixed rack.

Referring to the accompanying drawings, Figure 1 represents a vertical longitudinal section of my improved vise, the jaws being gripped upon the work by the action of the screw; Fig. 2, a similar section, the movable jaw being free to be moved in and out by hand,

the rack-nut being thrown out of action; Fig. 3, a top view of the vise, showing the lever clamping-nuts for the swiveling base; Fig. 4, a cross-section taken through the lever clamping-nuts. Fig. 5 is a top view of the base, showing the construction which admits of the swiveling adjustment and clamping of the vise upon the bench; and Fig. 6, an elevation and section of the rack-nut and the sliding locking device for the screw.

The vise has the usual swiveling capacity upon a bed-plate, *a*, fixed upon the bench, the non-sliding jaw *b* being secured upon this bed-plate so as to admit of such swiveling function, as will be hereinafter stated. This jaw *b* is formed upon a guide-box, *b'*, open at both ends, within which the hollow bar *c* of the movable jaw *d* fits and slides. A rack of right-angled or square teeth, *e*, is fitted in a recess in the bottom of the jaw-box in a manner to be retained in position without screw-bolts or other fastenings, as will be presently stated. The hollow bar *c* of the movable jaw carries the operating-screw *f*, provided with a head and sliding hand-lever, and secured in the front end of said bar by a key-plate, *f'*, fitted within a groove in the screw-stem, so that the jaw and screw must move together. This hollow bar is open at the bottom, so that a rack-nut, *g*, carried by said screw and having right-angled or square teeth on its under side, is caused to engage with the fixed rack to place the movable jaw under the control of the screw to grip and hold the article placed between the jaws. In this relation of the parts the rack-nut is stationary, its square teeth intermeshing with the square teeth of the fixed rack, giving a strong and durable hold against the power of the screw in gripping the article. The square or right-angled form of the teeth gives the advantage of firmly locking the rack-nut both ways, and allows the movable jaw to be drawn out with as much power as it has in the gripping action, which is very important in many operations. The faces of the teeth are brought together by the action of inclines and spring, and if they should strike one upon the other they will slide until they interlock. The disengagement of the rack-nut from the fixed rack suspends the function of the screw and allows the movable jaw to be slid in and

out by hand, so as to quickly set the jaw to a position to admit the article between the jaws, when the screw may be at once brought into working position to give the required grip upon the article. I provide a sliding locking device for effecting this action and non-action of the screw, using the screw itself to receive the locking action of said device to hold the teeth of the nut in engagement with the teeth of the fixed rack, in order to operate with the screw, while the movement of the rack-nut is used to shove said locking device out of the way of the screw, so that its nut can be withdrawn by the action of inclines from the fixed rack when it is desired to set the movable jaw quickly by hand. The rack-nut fits closely to the inner walls of the hollow bar, and the inner or free end of the screw is unthreaded and cylindrical. A box, *h*, is pinned within the hollow bar, and its open end forms the fixed inclines *h'* and receives the unthreaded end *i* of the screw between said inclines, which project from the sides of the box.

The sliding locking device is a stem, *i'*, formed with a concave end, *i''*, adapted to fit over the said unthreaded end *i*, and is fitted to move in said box toward and from the end of the screw. A spring, *j*, fitted within the box *h*, presses against a shoulder, *k*, of the stem *i'*, and constantly tends to force the locking device out of the box toward and over the end of the screw; but a pin, *l*, in the stem bears against the closed end of the box and limits the projection of said concave end *i''* between the inclines *h'* over the end of the screw, and thus firmly holds the rack-nut in the fixed rack. The rack-nut *g* is formed with inclines *g'*, corresponding to the inclines of the fixed box, and the end of rack-nut in which its inclines terminate is adapted to act against the projecting end of the sliding locking device to force the latter back in its box by turning the screw, and thereby move the concave end *i''* from over the end of the screw. Simultaneously with this driving back of the locking device the inclines of the rack-nut pass onto the inclines of the fixed box and raise the rack-nut out of the teeth of the fixed rack just as the end of the locking device clears the end of the screw. As the function of the sliding locking device is to hold the rack-nut firmly in the fixed rack to control the movable jaw by the screw, so is it necessary to move the locking device back from the screw far enough to allow the end of said screw to pass the end of the locking device, and the teeth of said rack-nut to be thereby raised clear of the teeth of the fixed rack by the action of the inclines to free the movable jaw of the control of the screw. A spring, *m*, placed upon the top of the rack-nut bears against the under side of the top of the hollow bar, and forces the rack-nut down into the fixed rack when the inclines are separated. This movement of the rack-nut carries with it the unthreaded end of the screw down in position to allow the concave end *i''* of the locking device to pass over the unthreaded end *i*

of said screw to make the lock, as stated. The bottom of the fixed rack is made wider than the rack part proper, and the projecting sides *n n* form the ways for the sides of the hollow jaw-bar *c*, whereby the fixed rack is held secure in its recessed seat or bed by the movable jaw-bar.

The construction for effecting the swiveling and clamping of the vise is as follows, viz: The bed-plate *a* is formed with a central ring-projection, *a'*, having a central circular opening, *a''*, to receive a centering projection, *b''*, on the circular base *b'* of the fixed jaw-box, and upon which the fixed jaw part can be swiveled. A circular space, *a'''*, in the bed-plate surrounds the ring-projection, and the latter is formed with a rim, *a''''*, projecting within said circular space, and forming, with the space *a'''* and rim *a''''* on said bed-plate, a shouldered or T-shaped annular way within the bed-plate around the centering ring-projection. Screw-bolts *r r* have their square heads *s s* fitted within the circular T-shaped way, so that their shanks extend up through holes in the circular base of the fixed jaw to receive lever-nuts *t t*, by which to clamp the non-sliding jaw when set. The lever-nuts are cylindrical, and the lever part *t'* is jointed to the closed end of the nut, so that it can be used as a handle in a horizontal and vertical position in screwing and unscrewing the nut. The circular base has a recess around the hole for the screw-bolt to receive the end of the lever-nut, so as to give a very firm clamping hold. The bolt-heads are inserted into the annular shouldered way through an opening, *u*, in the bed-plate. In swiveling the vise the lever-nuts are unclamped by their pivoted handles and the square heads of the bolts follow around in the shouldered way as the vise is turned, and the clamping action of the heads is effected upon the circular projecting rims of the ring-projection of the base. When the rack-nut is engaged with the fixed rack the jaws can be opened and closed by turning the screw; but when the racks are separated, as in Fig. 2, the movable jaw can be moved in and out by hand and set to suit the article to be gripped, when the screw is immediately brought into action to grip the article by engaging the racks. Two revolutions of the screw are sufficient to effect and release the lock of the sliding device.

The cylindrical nut *t* has an interior screw-thread which does not extend through the nut, leaving its upper end closed to form a jointed connection with the lever *t'*, while the lower end of the nut fits into a circular recess, *b''''*, formed in the upper surface of the fixed jaw part *b'* around the bolt-hole, whereby the nut is held in central relation to bolt *r* and supported in a recessed or socket seat while being screwed hard upon the bolt. This construction is important in relieving the bolt of side strain, and allows of the use of a short bolt.

I claim—

1. The combination, in a vise, of the screw *f*, having the unthreaded cylindrical end *i*, the

fixed rack *e*, and the sliding rack-nut *g*, formed with inclines *g'*, and with right-angled or square teeth, with a sliding stem, *i'*, having a concave end, *i²*, a spring, *j*, for operating said sliding stem, a spring-bearing for the sliding nut, and the fixed inclines *h'*, substantially as described, for the purpose specified.

2. The combination, in a vise, of the screw having the unthreaded end *i*, the fixed rack *e*, the sliding rack-nut *g*, formed with inclines *g'*, and its bearing-spring *m*, with the sliding stem *i'*, having a concave end, *i²*, and a guide-box, *h*, for said stem, having inclines *h'*, and a spring, *j*, for operating said sliding stem, arranged within said guide-box, substantially as described, for the purpose specified.

3. In combination with the jaws of a vise, a screw having an unthreaded cylindrical end, *i*, a rack-nut, *g*, having inclines *g'*, a sliding stem, *i'*, having a concave end, *i²*, the guide-box *h*, having the inclines *h'*, and the springs for operating the rack-nut and the sliding stem of the rack *e* of the fixed jaw having the side projections, *n*, corresponding with and forming the ways for the movable jaw-bar, substantially as described, for the purpose specified.

4. The combination, in a vise, of the bed-plate *a*, having the central rimmed projection and the surrounding annular way, and the fixed jaw part *b³*, having the central hub part, *b²*, with the square-headed bolts *r*, and the jointed lever-nuts *t t'*, adapted to receive the said screw-bolts by interior screw-threads, substantially as described, for the purpose specified.

5. In a swiveling vise, the fixed jaw part *b³*, having the circular recessed seats or sockets in its upper surface around the bolt-holes, in combination with the screw-bolts *r*, the cylindrical nuts *t*, having interior screw-threads, the levers *t'*, jointed to said nuts, and the bed-plate, all constructed and adapted for use, substantially as described, for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY F. READ.

Witnesses:

A. E. H. JOHNSON,
EDMOND BRODHAG.