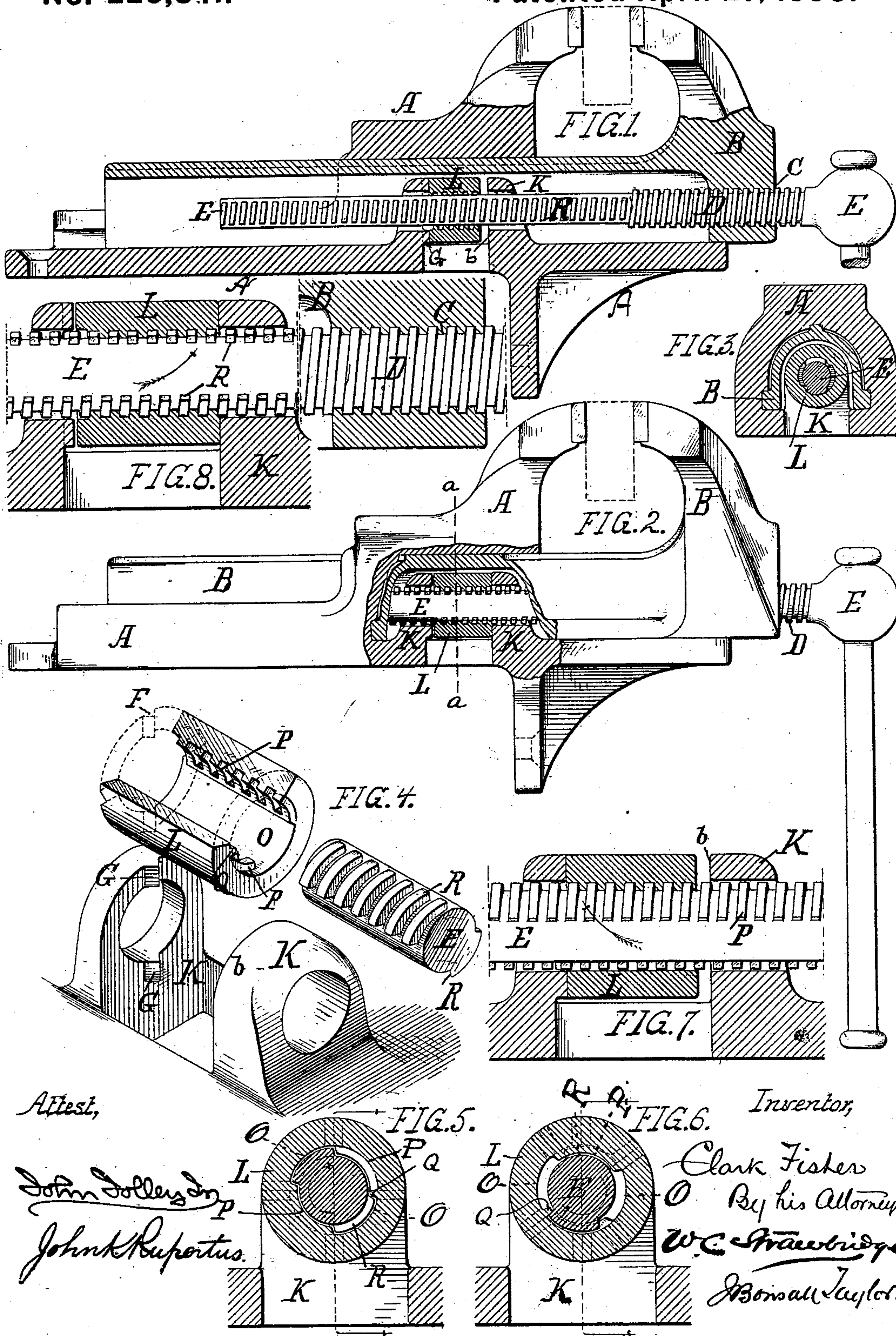


C. FISHER.
Vise.

No. 226,841.

Patented April 27, 1880.



Attest,

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UNITED STATES PATENT OFFICE.

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WISE.

SPECIFICATION forming part of Letters Patent No. 226,841, dated April 27, 1880.

Application filed February 16, 1880.

To all whom it may concern:

Be it known that I, CLARK FISHER, of Trenton, New Jersey, have invented an Improvement in Vises, of which the following is a specification.

My invention relates to vises or clamps used for temporarily holding securely in any desired position various articles in the process of their manufacture.

In the above tools the three principal members are two jaws and a connecting-screw, one of the former being fixed, while the other is movable in and out by turning the screw.

In the common forms of vise the movable jaw is practically a nut traversing the screw to or from the fixed jaw, while the relation of the latter to the screw in the direction of its axis is fixed.

When the different articles to be grasped vary much in dimension time is lost by the workman, who is obliged to turn the screw a great number of times (depending upon the pitch of its thread) for each difference in size of the article—as, for example, in the case of a brick to be successively grasped in the direction of its thickness, length, or breadth.

To remedy the above objection many devices have been employed for obtaining quickly an approximate adjustment of the movable jaw before the final operation of tightening, and it is to this latter class of vises that my invention belongs.

My invention relates to the construction of a vise in which the point of attachment of the screw to the fixed jaw can be momentarily changed from one part to another of the length of the screw, while the final tightening or loosening is produced by the inward or outward movement of the movable jaw along the axis of the screw; and it consists in the devices hereinafter described and claimed.

The above actions are accomplished by the devices hereinafter described.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation through a vise embodying my invention, the movable jaw not tightened up; Fig. 2, a longitudinal side elevation of the same, the region of the locking-collar being in section and the movable jaw tightened up; Fig. 3, a transverse

section on the line *a a* of Fig. 2; Fig. 4, a perspective detail of the bearing, a sectional perspective view of the locking-collar, and a sectional perspective view of that portion of the shaft which is provided with segmental threads; Figs. 5 and 6, cross-sections of the locking-collar and that portion of the vise-screw which is provided with segments of screw-threads, the parts being unlocked in Fig. 5 and locked in Fig. 6; Fig. 7, a sectional view of the bearing and locking-collar with the clutch in action; Fig. 8, a sectional view of the same parts with the clutch out of action, showing also the threaded portion of the screw and its bearing in the movable jaw.

Similar letters of reference indicate corresponding parts.

While my invention is applicable to any description of vise, yet for simplicity in this specification I have represented and described it as applied to a table-vise.

Referring to the drawings, A is the fixed jaw of a table-vise of common form, and B the movable jaw, which slides in the fixed jaw. The movable jaw is provided in front with a screw-threaded orifice, C, in which works the screw-threaded portion D of the vise-screw E.

At the termination of the screw-threaded portion D of the vise-screw there is formed upon the shank of said screw, to the end thereof, one or more series of segmental teeth or longitudinal racks, R. The racks are designed to co-operate with leaves or teeth within the collar, in a manner hereinafter explained.

Within the hollow center of the fixed jaw is a bearing, K, conformed to retain the locking-collar L, which operates within it.

The locking-collar L is a hollow cylinder, the front end of which is true and designed to rotate freely against the inner front face of the bearing K, while the back end of the collar is provided with seats F, corresponding to lugs G on the inner back face of the bearing, and designed to co-operate with the latter in forming a clutch of well-known form. Upon its interior the collar is divided off into any given number of segments in the direction of its axis. These segments are alternately smooth-surfaced and provided with leaves or teeth.

In the drawings two opposite smooth segments, O, and two opposite segments provided with leaves P are represented. It is, however, to be understood that the segmental divisions may be in any suitable number—as, for instance, six, alternately three smooth and three provided with leaves. In every case, however, the racks on the screw must correspond in number and proportion with the smooth segments of the collar, so that when coincident therewith the screw can be slid through the collar; but when rotated so as to be not coincident the racks lock with the leaves, and the screw cannot be slid through the collar.

The pitch of the leaves of the collar and teeth of the rack may be such as convenience of manufacture suggests, their width, depth, and proportion generally such as will enable them to take a hold upon each other so firm as to give the requisite resistance to insure the moving in of the movable jaw of the vise when the screw is locked.

Along either side, according as the vise-screw is right or left handed, of one or all of the series of leaves in the collar is a fixed rib or stop, Q.

Such being the construction of my invention, it will be understood that the screw-threaded portion D of the vise-screw is always engaged within the threaded orifice C in the movable jaw, and that therefore, when any obstacle resists a longitudinal movement of said screw, further rotation of the same will move the jaw B in or out, according to the direction of the rotation.

It will also be understood that the collar and the portion of the vise-screw which is provided with segmental teeth or racks are so relatively constructed that when the leaves formed upon the interior of the collar are placed opposite to the smooth portions of the shank of the screw the racks on said shank will come opposite to the smooth portions on the interior of the collar, and the screw in consequence can be slid longitudinally in either direction through the collar; whereas if the screw be slightly rotated, so as to cause its racks to engage with the leaves in the collar, the screw can be no longer moved longitudinally.

The stops Q, which close on one side the leaves of the collar, constitute a means whereby the collar, after the leaves thereof have been once engaged with the racks on the shaft, cannot, by further rotation in the same direction, become again so placed that the screw is again capable of longitudinal movement through the collar, and are the cause of holding the collar stationary against rotation out of engagement with the racks (after the leaves have been engaged therewith) when the screw is rotated in one direction.

Suppose the collar held from rotating either by means of the clutch device or by reason of its own weight and construction, and the screw slipped within it as far as desired, the screw,

when rotated, will by its racks engage the leaves of the collar, (in which position, the collar being longitudinally rigid, the screw cannot be longitudinally slid.) Further rotation of the screw therefore causes the rotation of the collar against the front face, b, of the bearing, whence it results that the screw acts only upon the movable jaw, throwing the latter inward, the collar for the time being becoming a fixture or head upon the screw.

A reverse rotation of the screw will cause its racks to clear the leaves of the collar. After such clearance has been effected, the screw being retained in the position necessary to clear, it is obvious that the screw, and with it the movable jaw, can be drawn completely out of the fixed jaw, pushed in until both jaws are in contact with an object to be held, or moved in or out to any desired extent.

Suppose the rack-teeth and leaves to clear when the movable jaw is out to its full extent short of clearing the collar, then the screw and movable jaw are pushed in until the jaws are, for instance, in the position of Fig. 1. The rotation of the screw after the placing of the parts in said position will first throw the racks into engagement with the leaves of the collar until the stop Q prevents further movement, after which continued rotation of the screw can act only upon the movable jaw, inasmuch as the collar, being fixed upon the screw, rotates fixedly with it, and forms, in conjunction with the front face of the bearing K, such a resisting-stop as insures movement to the jaw only in any further rotation of the screw, as shown in Fig. 2.

To release the jaw the screw is rotated in a contrary direction until the racks disengage with the leaves of the collar, after which the shaft and movable jaw can be drawn in or out through the collar, as before described.

It will be observed that there is sufficient room for the play of the collar endwise within its bearing to secure the locking or release of the clutch-lugs, the clutch being employed to aid the racks in taking hold of the leaves of the collar in the case, for instance, of the collar's rotating too freely and with the screw without locking. Engagement in such cases is effected and the collar restrained from rotating by its being pushed back until the clutch-lugs engage with their seats, although in most instances a simple rotary movement of the screw is alone necessary.

Having thus described my invention, I claim—

1. In a vise, a vise-screw one end of which is fully threaded in the movable jaw, and the other end of which is provided with racks or segmental threads adapted to either slide longitudinally within or engage fixedly with correspondingly-formed leaves or threads upon the inside of a collar rotatably secured within the fixed jaw, as and for the purpose set forth.

2. In a vise of the character hereinbefore set forth, the locking-collar L upon the vise-screw, being a hollow cylinder internally provided

with longitudinal segments alternately smooth-faced and provided with teeth, and operating to revolve freely within or by means of any fit clutch device to clutch against a bearing in the fixed jaw of the vise, substantially as shown and described, and for the purpose specified.

3. The combination of the locking-collar L, sustained by the screw E, and the bearing K, by means of the clutch F G, as and for the purpose set forth.

4. The combination of the vise-screw, one portion of which is screw-threaded, while another portion is provided with alternate smooth-faced segments and toothed segments, with the movable jaw of the vise, and with the revolving collar in the fixed jaw, the interior of which collar is provided with correspond-

ing alternate smooth-faced segments and toothed segments, substantially as shown and described, and for the purpose specified.

5. In a vise, the combination, with a bearing one face of which is smooth and the other provided with a clutch device, of a collar one end of which is smooth and the other provided with a corresponding clutch device adapted to be brought by means of the vise-screw into contact with either face of the bearing, as and for the purposes set forth.

In testimony whereof I have hereunto signed my name this 31st day of January, A. D. 1880.

CLARK FISHER.

In presence of—

J. BONSALL TAYLOR,
WM. C. STRAWBRIDGE.