

(No Model.)

W. J. O'BRIEN.
QUICK ACTING VISE.

No. 595,546.

Patented Dec. 14, 1897.

Fig. 1.

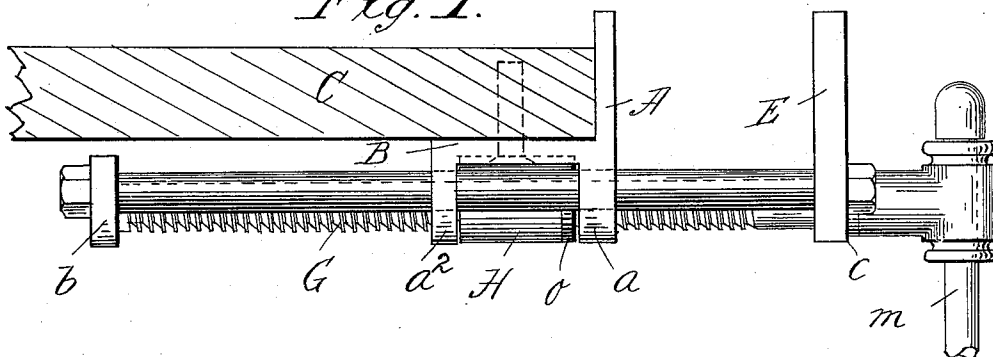


Fig. 2.

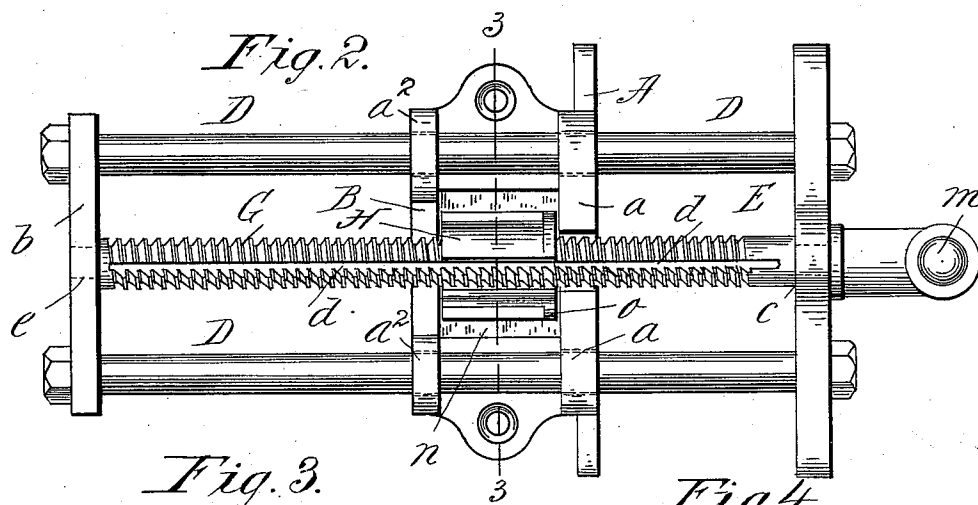


Fig. 3.

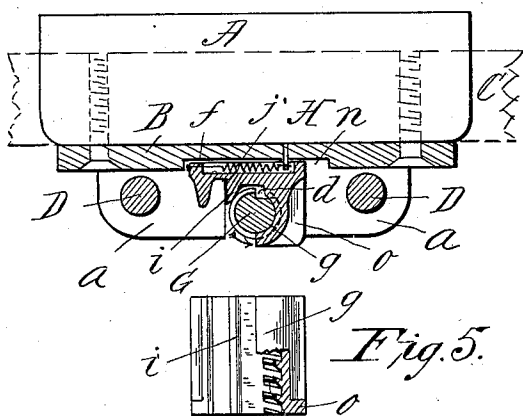


Fig. 4.

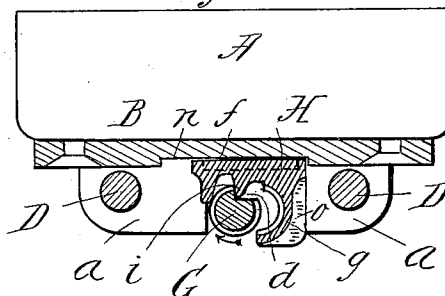
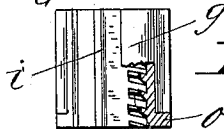


Fig. 5.



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WILLIAM J. O'BRIEN, OF HOLYOKE, MASSACHUSETTS.

QUICK-ACTING VISE.

SPECIFICATION forming part of Letters Patent No. 595,546, dated December 14, 1897.

Application filed September 25, 1897. Serial No. 652,949. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. O'BRIEN, a citizen of the United States, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Quick-Acting Vises, of which the following is a specification.

This invention relates to improvements in a bench-vise of the quick-acting class—that is, a vise in which the movable jaw is operated to open or close by being slid, the movable jaw at such time being disengaged from the threads of the feed-screw, so that it may be quickly moved either toward or away from the fixed jaw to be brought to approximately the distance from the said fixed jaw to receive the part or piece of work to be held, the movable jaw then being tightened with a hard bind against the object to be held by the turning of the screw in the proper direction.

The object of the invention is to produce a vise of the character mentioned which is of great simplicity in construction, embodying very few parts, and which is efficient, practicable, convenient, and satisfactory in operation.

The invention consists in the constructions and combinations of parts, all substantially as will hereinafter fully appear, and be set forth in the claims.

The improved vise is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a plan view of the under side of the vise. Fig. 3 is a vertical cross-sectional view taken on the line 3 3, Fig. 2. Fig. 4 is a substantially similar cross-sectional view as Fig. 3, but showing a different position of the nut which engages the screw, the latter being in such view shown as disengaged from the screw, whereby the screw and movable jaw may be moved either toward or from the fixed jaw; and Fig. 5 is a plan view of the under side of the nut with a portion thereof broken away and in section, showing the threads thereof.

Similar letters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the fixed jaw of the vise, which is cast or otherwise formed as one with the base B, which is arranged step-like in relation to said jaw, whereby it

may be screwed or bolted to the bench C. (Indicated in Fig. 1.) The base has the integrally-formed depending ear-lugs a a^2 a^3 , having circular holes in alinement with each other and forming slide-supports for the bars D D or runners on which the movable jaw E is engaged, said bars D D having their ends opposite the movable jaw united by the tie-bar b . The feed-screw G is engaged at c with the movable jaw, so as to turn freely in relation thereto, but to have no axial movement relative thereto, the opposite end of said screw turning in a socket at e therefor in the central portion of the said tie-bar b . The said feed-screw has the longitudinal spline-groove d running substantially from end to end thereof, this being ratchet-like in cross-sectional contour. (See Figs. 2, 3, and 4.)

H represents the nut or threaded segment, which is constructed and arranged relative to the spline-grooved feed-screw to engage the screw and also to engage the ear-lugs of the base B, so that when the screw is turned it will necessarily derive an axial movement, and said nut is adapted under proper circumstances to be moved transversely to the length of the screw and thereby to be out of engagement with the latter. As shown, this nut comprises the inverted base f , having the depending portion g , with an approximately semicircular depression therein which is provided with the screw-threads h , so formed as to engage the threads of the feed-screw. The said inverted base f has parallel with and somewhat removed from the threaded concave face of the portion g of the nut the depending rib i , the location of which, as seen in Fig. 3, when the nut is in engagement with the screw, is adjacent the side of the screw, the spring j , applied between the base B and the nut, exerting by its reaction a pressure in a direction to force the nut, with its threads, out from engagement with the threads of the screw, and, noting Fig. 3, so long as the screw is turned in the direction of the small arrow the nut will remain in the screw-thread engagement, and the slow and forcible screw-exerted pressure of the movable jaw E toward the fixed jaw will result, the nut being substantially immovable endwise, being in bearing at its end against the ear-lug abutments a a ; but assuming that the screw G is turned by its han-

dle *m* in the reversed direction to that indicated by the arrow in Fig. 3—that is, in the direction indicated by the arrow in Fig. 4—as the spline portion of the screw comes around toward the rib *i* the radial wall of the ratchet-like spline will come into engagement with the said rib *i* of the nut and carry the nut in a horizontal direction bodily away from its engagement with the screw-threads, as indicated in Fig. 4, and as this crosswise movement of the nut is continued said rib *i* will block the feed-screw from making a complete rotation, as the rib is continuous, as shown, and has no passes for the teeth of the screw-threads; but under the conditions now established the feed-screw may be slid, and with it the movable jaw *E* and the guide-rods *D*, in either direction, the spline-grooves of the screw sliding freely along over and without impediment by the said rib of the nut.

Noting the position of the parts in Fig. 3, and assuming that the screw is turned in a direction the reverse of that indicated by the arrow, it will be explained that the crosswise movement of the nut to the right, so that the nut assumes the position with the rib within the spline-groove as seen in Fig. 4, is caused by the weight of the nut and the considerable frictional engagement or closeness of fit which the threads of the screw have with the threads or teeth of the nut, in practice being assisted or rendered more certain by the spring, and, again, the spring may be dispensed with, for, as a matter of fact, with the parts in the position shown in Fig. 4 on turning the screw in the direction the reverse of that indicated by the arrow in said figure the tangential side of the spline-groove will act in the manner of the face of a gear-tooth to force the nut sufficiently close to the side of the screw so that the frictional rolling engagement of the screw-threads of the screw will cause the threads of the nut to bottom into the screw. While the spring is deemed desirable, its use is by no means essential.

In practice and as shown in the drawings the under side of the base *B* has the slight depression *n* therein, the width of which is ample to allow the crosswise movements of the nut, while the length thereof is a trifle greater than the length of the nut, so that the latter will not become bound as the vise is operated. The nut is shown also at one end with the cheek *o*, the end of which is perpendicular to the surface, which slides on the base of the said depression *n*, so as to give a wide and stable bearing against the face of the ear-lugs *a a* to withstand the hard screw-pressure which is exerted between these parts as the screw is turned to close the jaw tightly against the object being held.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a vise, the combination with the fixed jaw, of the movable jaw and guides and sup-

ports therefor, the feed-screw engaged and bodily movable with the movable jaw and having a longitudinal groove, the threaded segment or half-nut movable transversely relative to the screw, and having the rib *i* so arranged that as the nut moves from engagement with the screw, the said rib will assume its position within said groove of the screw, substantially as described.

2. In a vise, the combination with the fixed jaw having base *B* provided with an abutment member *a*, of the movable jaw and guides and supports therefor, the feed-screw engaged to move bodily with the movable jaw and to rotate relative thereto and provided with the spline-groove *d* of ratchet form, the threaded segment or half-nut movable and adapted to engage and disengage the screw, and having its end against said abutment member, and provided with the rib ranging parallel with the screw, and adapted on the disengagement of the threads of the nut from the screw to have said rib assume a position in said groove, preventing the turning of the screw in reverse of its jaw-closing direction, but permitting the sliding of the screw (and jaw) over said rib, substantially as described.

3. In a vise, the combination with the fixed jaw having the base *B* formed with the depression *n* in its under side provided with the opposite sets of ear-lugs *a a*, of the movable jaw and the guide-rods *D D* movable through holes therefor in said ear-lug, the feed-screw engaged to move bodily with the movable jaw, and to rotate relative thereto, and provided with the spline-groove *d* of ratchet form, the threaded segment or half-nut movable on the base of said depression *n*, and adapted to engage and disengage the screw, and having its end against one of said ear-lugs *a*, and provided with the rib ranging parallel with the screw, and adapted, on the disengagement of the threads of the nut from the screw to have said rib assume a position in said groove, substantially as and for the purposes set forth.

4. In a vise, the combination with the fixed jaw, of the movable jaw and guides and supports therefor, the feed-screw engaged and bodily movable with the movable jaw and having a longitudinal groove, the threaded segment or half-nut movable transversely relative to the screw, and having the rib *i* so arranged that as the nut moves from engagement with the screw, the said rib will assume its position within said groove of the screw, and a spring for forcing said nut in a direction away from the screw, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 21st day of September, 1897.

WILLIAM J. O'BRIEN.

Witnesses:

WM. S. BELLOWS,
M. A. CAMPBELL.