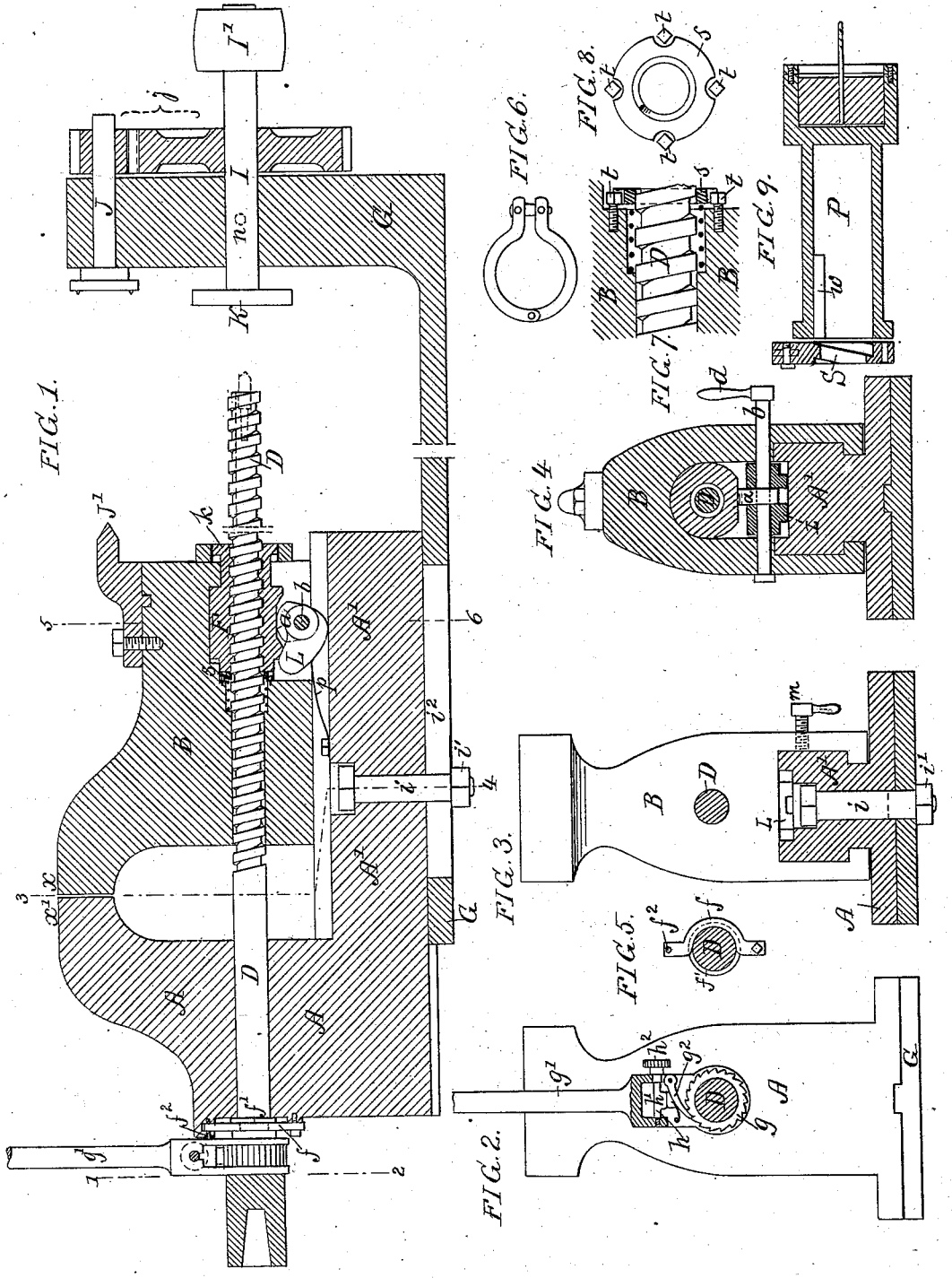
(No Model.)

J. R. McMILLAN.

COMBINED VISE AND LATHE.

No. 292,342. Patented Jan. 22, 1884.



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UNITED STATES PATENT OFFICE.

JAMES R. McMILLAN, OF PHILADELPHIA, PENNSYLVANIA.

COMBINED VISE AND LATHE.

SPECIFICATION forming part of Letters Patent No. 292,342, dated January 22, 1884.

Application filed August 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. McMILLAN, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Combined Vise and Lathe, of which the following is a specification.

One object of my invention is to so construct a vise that it can be used as a lathe or boring-machine, a further object being to insure a firm grip of the jaws of the vise on the work. These objects I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of my improved vise; Figs. 2, 3, and 4, transverse sections, respectively, on the lines 1 2, 3 4, and 5 6, Fig. 1; and Figs. 5, 6, 7, 8, and 9, detached views of parts of the vase.

A is the fixed stock of the vise, and B the movable stock of the same, the stock A being bolted to a bench or other support, and the stock B being guided upon the projecting stem A′ of said stock A, in the usual manner.

D is the screw-spindle of the vise, which is fitted snugly to, but can turn freely in, longitudinal openings in the two stocks, and is also adapted to a nut, F, fitted to a recess in the stock B, and capable of being locked to or released from said stock by means of an arm, *a*, on a rock-shaft, *b*, the arm being adapted to bear upon a flattened portion of the nut, as shown in Fig. 4, and the shaft being free to turn in bearings in the stock B, and being provided with a handle, *d*, so that the arm can be caused to engage with and retain the nut, or can be thrown down, so as to free the same and permit it to turn with the screw-spindle.

Other forms of locking and releasing devices for the nut can be used in place of that shown, the loose nut being a common feature in some vises, for the purpose of permitting the ready adjustment of the movable stock of the work prior to the clamping of the latter.

The screw-spindle is confined longitudinally to the stock A by an arm, *f*, pivoted to the stock at its lower end, adapted to engage with a grooved collar, *f′*, on the spindle, and provided at the upper end with a locking-pin, f^2, or other suitable fastening device. (See Figs. 1 and 5.) The spindle has a ratchet-wheel, *g*, and hung to the spindle is a lever, *g′*, which carries a spring-pawl, g^2, acting on the ratchet-wheel. Above the pawl is a shaft, *h*, having a cam, *h′*, which can be caused to bear upon the pawl so as to lock the same to the wheel *g*, in which case the lever serves as a handle by which the spindle D can be turned in either direction, the pawl acting in the usual manner under control of the spring when the cam *h′* is lifted. The shaft *h* has a milled head, h^2, by which it can be readily manipulated.

Beneath the stem A′ slides the horizontal portion of a frame, G, which is secured vertically to the stem by means of a bolt, *i*, and nut, *i′*, the bolt being adapted to a slot, i^2, in the frame, so that the latter can be adjusted longitudinally in respect to the stock A. The outer portion of the frame is vertical, and carries two spindles, I and J, connected by spur-gearing *j*, the spindle I being in line with the screw-spindle D, and the spindle J in line with a fixed center pin or stud, J′, secured to the stock B of the vise. The inner end of the screw-spindle D has a socket for the reception of a drill or other tool, and the nut F projects beyond the rear face of the stock B, and has a flange, *k*, which can be grasped by the hand, or by a friction clamping device—such as shown in Fig. 6, for instance—in order to return the nut when it is released from the control of the arm *a*, as described hereinafter. The outer end of the spindle D also has a socket for the reception of a suitable tool. The nut F has a slight longitudinal play in the recess of the stock B, and on the operation of the screw-spindle the first effect of the movement is to draw the nut forward in the recess.

Hung to the shaft *b*, which is carried by the stock B, is a cam-lever, L, the long arm of which bears upon the front edge of the nut, and is held in contact therewith by a spring, *p*, the short arm of the lever being forked, and bearing upon the bottom of the recess in the arm A′ of the fixed stock of the vise. It will thus be seen that the first movement of the screw-spindle D causes the nut to act on the

lever L and the latter to bind on the arm A′, so as to tip up the rear end of the stock B and throw the upper part of the jaw *x* of the same toward the jaw *x′* of the stock A. By this means I overcome the tendency which ordinary vises have to spread apart at the top of the jaws, where most of the work is held.

The tipping of the stock implies a loose fit of the guides of the same; but this is almost always the case after the vise has been in use for a time, and the movement of the lever L is adjusted, as described hereinafter, to accord with this loose fit.

A spring-ring, *s*, bears upon the front edge of the nut, and serves to prevent any rattling or loose movement of the stock B, the tension of the spring being less than the effort required to move the stock B by the nut, so that the lever L will always be actuated before the stock is moved forward. Set-screws *t* are carried by the stock B, and in the present instance adapted to recesses in the ring. (See Figs. 7 and 8.) The nut, in its forward movement, acts upon the lever L until the nut comes into contact with the heads of these set-screws, when the movement is transmitted to the stock B and further operation of the lever L is prevented, said lever sliding with the stock.

By adjusting the set-screws *t* the amount of pressure imparted to the lever L before the movement of the stock B commences can be readily varied.

In using the vise the screw-spindle is confined longitudinally to the stock A by the arm *f*, the nut F is locked to the stock B by the arm *a*, and the lever *g′* is secured to the spindle D by the action of the cam *h′* on the pawl g^2. The vise thus works the same as an ordinary vise.

Ordinary wood-turning can be accomplished by securing the object to the spindle J, which is driven from the spindle I, the latter being turned by hand or by a belt adapted to the pulley I′.

When it is desired to use the screw-spindle D of the vise, in connection with the spindle I, for drilling, boring, or other work, the stock B is first closed against the stock A, and secured in this position by a set-screw, *m*. The screw-spindle D is then released from the stock A by retracting the arm *f*, and the nut F is freed from the stock B by depressing the arm *a*, the spindle being then drawn out to its full extent. The spindle is now at liberty to be rotated by the lever *g′*, either continuously if the pawl is locked to the ratchet, or intermittently if the pawl acts upon the ratchet, as usual, the work being held in a chuck, K, on the spindle I, which can be turned backward, if desired, or may be prevented from turning by a suitable transverse pin, *n*, as shown by dotted lines in Fig. 1. Where a drill is being used, the proper feeding of the same is effected by the friction exerted upon the flange *k*, either by hand or by the friction clamping device, Fig. 6, the spindle being caused to move rearward as it is rotated so long as the nut is prevented from turning.

When it is desired to work a drill or boring-tool without releasing the spindle D from its longitudinal connection with the stock A, I use the attachment shown in Fig. 9. This consists of a sleeve, P, carrying a drill-chuck, and having a spline, *w*, adapted to a slot cut in that portion of the screw-spindle which projects beyond the stock B when the latter is closed against the stock A.

To the spindle D is fitted a clamp-nut, S, similar to that shown in Fig. 6, this nut bearing upon the inner end of the sleeve, as shown in Fig. 9. When the spindle is rotated, the sleeve P will rotate therewith, owing to its spline *w*, and as long as the nut S is permitted to rotate with the spindle there will be no feeding of the sleeve and its drill; but if the nut is prevented from turning, there will be a movement of the same on the spindle and a corresponding movement of the sleeve, as will be readily understood.

I claim as my invention—

1. The combination of the stocks A and B of a vise, the nut F, and means for locking and releasing the same, and the screw-spindle D, adapted to the nut, and constructed at the end for the reception of a tool, as set forth.

2. The combination of the stocks of the vise, the screw-spindle D, constructed for the reception of a tool, the nut F, means for retaining and releasing the same, and the adjustable frame G, having a spindle, I, as set forth.

3. The combination of the stocks A and B of the vise, the screw-spindle D, constructed for the reception of a tool, the nut F, and means for locking and releasing the same, said nut having a projecting portion, *k*, through which retaining friction may be applied to the nut, as set forth.

4. The combination of the stock B of the vise and its stud J′ with the adjustable frame G, having a spindle, J, and means for rotating the same, as set forth.

5. The combination of the stock B of the vise, its nut F, and means for locking and releasing the same, the stock A, the spindle D, and means for locking said spindle longitudinally to or releasing it from the stock A, as set forth.

6. The combination of the spindle D, and its ratchet-wheel *g* with the lever *g′*, the pawl g^2, and the shaft *h*, with its locking-cam *h′*, as set forth.

7. The combination of the stock A and its arm A′, the sliding stock B, the screw-spindle D, the cam-lever L, hung to the stock B and bearing on the arm A′, and the nut F, having a slight play in the stock B, and arranged to act upon the lever L, as set forth.

8. The combination of the stock A and its

arm A′, the sliding stock B, the screw-spindle D, the cam-lever L, the nut F, and the spring-ring *s*, as set forth.

9. The combination of the stock A and its arm A′, the sliding stock B, the screw-spindle D, the cam-lever L, the nut F, and the set-screws *t*, as set forth.

10. The combination of the screw-spindle D, having a slot therein, the sleeve P, having a spline, *w*, and the clamping-nut S, as set forth.

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

JAMES R. McMILLAN.

Witnesses:

JOHN E. PARKER,

HARRY SMITH.