M. E. WINANS.

BENCH VISE.

APPLICATION FILED DEC. 26, 1917.

1,296,723.

Patented Mar. 11, 1919.

2 SHEETS—SHEET 1.

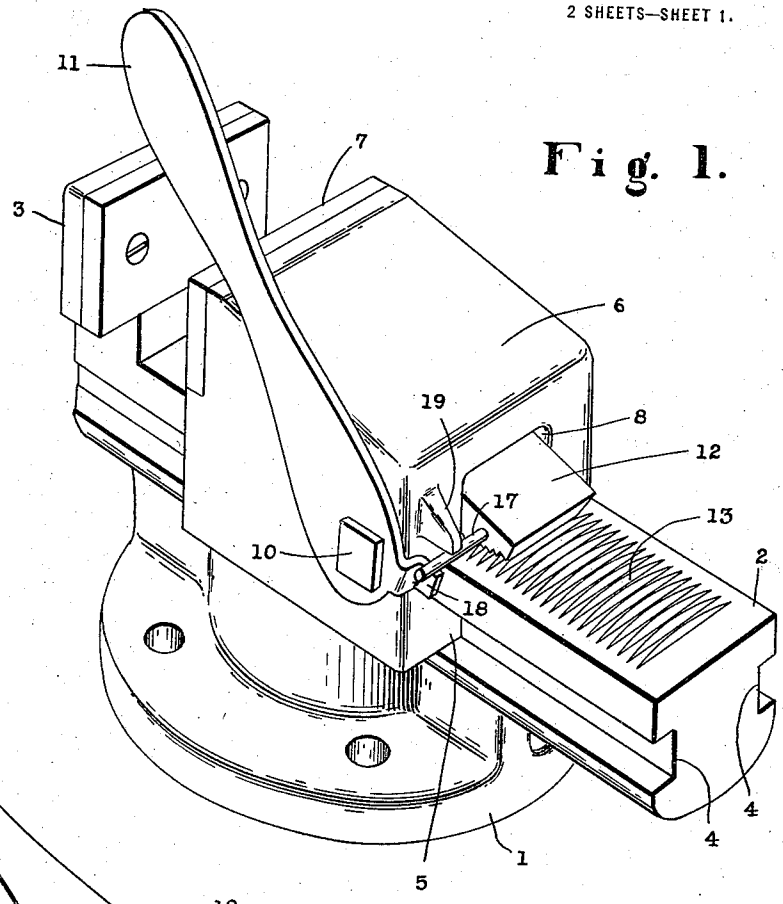


Fig. 1.

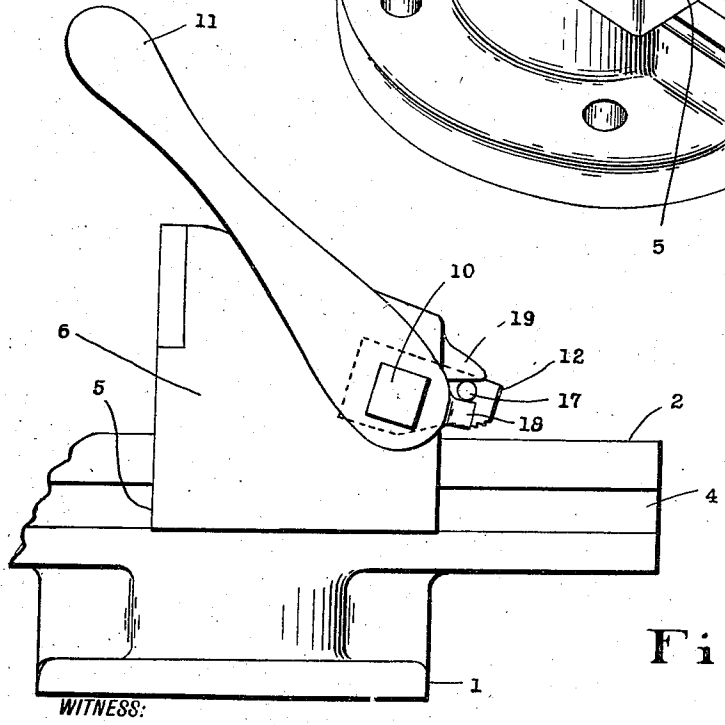


Fig. 2.

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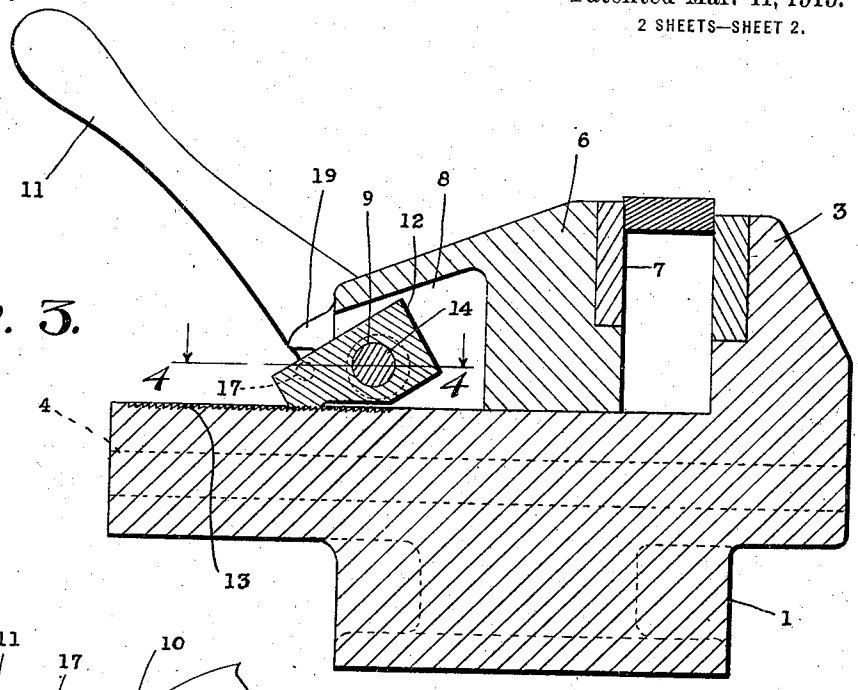


Fig. 3.

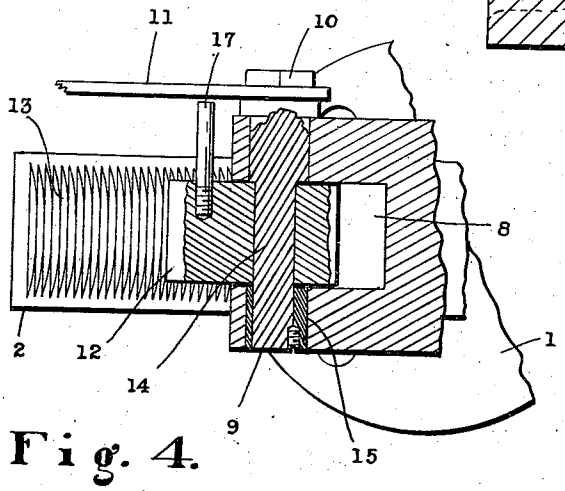


Fig. 4.

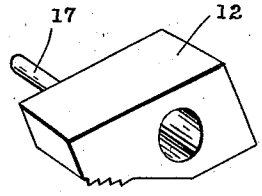


Fig. 5.

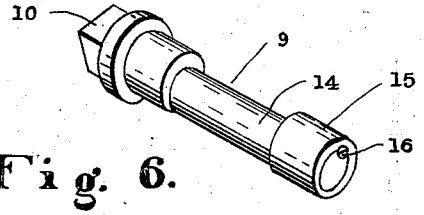


Fig. 6.

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UNITED STATES PATENT OFFICE.

MILTON E. WINANS, OF NEWARK, NEW JERSEY.

BENCH-VISE.

1,296,723. Specification of Letters Patent. Patented Mar. 11, 1919.

Application filed December 26, 1917. Serial No. 208,815.

To all whom it may concern:

Be it known that I, MILTON E. WINANS, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Bench-Vises, of which the following is a specification.

The objects of this invention are to provide an improved bench vise in which there are no projections from the front jaw, such as would be in the way of the workman, and in which the front jaw is stationary and thus always supported with the same firmness and solidity; to enable the position of the adjustable rear jaw to be quickly and readily changed; to hold it in position, when adjusted, by supporting means directly back of its working face; to provide for this purpose a pawl or ratchet and an eccentric, cam or the like; to operate said eccentric or cam by a lever which is thus set back from the front of the vise and has to be swung through only a short arc; to utilize said lever for releasing and engaging the pawl or ratchet with its rack teeth; to also utilize it for sliding the movable jaw, and to secure other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings, in which like numerals of reference indicate the same parts throughout the several views.

Figure 1 is a perspective view of my new vise with its parts in position to slide the movable jaw;

Fig. 2 is a side elevation of the same with the front jaw broken away;

Fig. 3 is a vertical central longitudinal section showing a piece of work clamped in the vise;

Fig. 4 is a detail section on line 4—4, Fig. 3, looking downward, as indicated;

Fig. 5 is a detail perspective view of the pawl or ratchet, and

Fig. 6 is a detail perspective view of the eccentrics or cams for coöperating with said pawl or ratchet to clamp the movable jaw of the vise against its work.

In the specific form of the invention shown in said drawings, 1 indicates a suitable base adapted to be bolted or otherwise secured to a bench or the like, as is customary with vises, and said body portion provides at its upper part a horizontal transverse slideway 2 with a fixed jaw 3 at one end of the slideway. This jaw 3 is at the front of the vise, or next the workman, in use, and preferably it does not project materially beyond the base of the body portion, so that it is firmly and rigidly supported. Since this jaw is fixed and does not project materially from the front of the vise, there is nothing to obstruct free access to the vise or get in the way of the workman.

The sides of the slideway 2, which extend rearward from the fixed front jaw 3, are grooved or channeled as at 4, 4, so as to receive inwardly extending dependent feet 5, at opposite sides of a movable jaw 6 mounted on said slideway. Said movable jaw provides at its end next the front jaw a corresponding working face 7 and the rear part of said movable jaw has above the slideway 2 a recess or chamber 8 which opens through the rear end of the jaw. A shaft 9 extends transversely of the movable jaw through said recess or chamber 8 and has a squared outer end 10 adapted to receive a handle or lever 11. Said shaft also extends through a pawl 12 located in the recess or chamber 8, said pawl occupying an inclined position as shown in Fig. 3, with its rear end adapted to engage the top of the slideway 2. Preferably said slideway is notched to provide a rack 13 and the underside of the rear end of the pawl 12 is correspondingly toothed to engage said notches. The shaft 9 is eccentric with respect either to the pawl 12 or to its bearings in the movable jaw, so that turning of the shaft will tend to project the pawl from the chamber or recess 8 or retract it into the same, according to the direction of turning. I have shown the middle portion 14 of the shaft, which extends through the pawl, as eccentric with respect to the rest of the shaft, and the end of the shaft away from its square end 10 provided with a removable sleeve 15 held in place by a screw 16, so that the shaft can be removed and replaced, although it will be understood that these details may be varied as desired.

In operation, the movable jaw is slid up against a piece of work placed in the jaws, as shown in Fig. 3, and then the shaft 9 is turned by its handle or lever 11 in the proper direction to force the pawl 12 rearward. Said pawl, however, being in engagement by its toothed lower rear end with the rack teeth of the slideway, the turning action of the shaft 9 will force the slidable jaw against the work to grip the same. The

pressure thus obtained can be very great, because of its wedging quality, and will hold without slipping at any point to which the shaft is turned by means of its lever 11. The work is thus very readily and forcibly clamped, and is easily and quickly released when desired, an added advantage of the structure being that the handle or lever 11 may be swung through only a small angular distance, less than 90°. It should also be noted that the preferred arrangement is such that in clamping the handle or lever 11 swings away from the work.

Preferably means are provided for automatically lifting the pawl or ratchet 12 when the same is released, and I have shown such means as a pin 17 projecting from the side of the pawl or ratchet and adapted to be engaged by a projection 18 on the handle or lever 11, said projection being located so that as the lever is swung to turn the shaft 9 so that its cam or eccentric portion retracts the pawl, said projection will engage beneath the pin 17, as shown in Figs. 1 and 2. To limit such uplifting of the pawl 12, a lug 19 projects from the rear end of the movable jaw into the path of the pin 17 as it moves upward in lifting the pawl. This furthermore enables the handle or lever 11 to be utilized for sliding the movable jaw as well as for locking and releasing it, for it will be noted that when the lever or handle is thrown forward to release the pawl and raise the same continued pressure will slide the movable jaw toward the fixed jaw. By changing the direction of pressure from a forwardly downward direction to a rearwardly downward direction, the movable jaw may be slid backward with its pawl still released and held raised as shown in Figs. 1 and 2.

It will be understood that any mechanically equivalent means for getting the action of the cam or eccentric which I have described may be employed without departing from the spirit and scope of my invention, and that also any well-known substitute for the pawl and rack may be employed as desired by those skilled in the art. Various other detail modifications may be made in the manufacture of my invention and I do not wish to be understood as limiting myself except as required by the following claims when construed in the light of the prior art.

Having thus described the invention, what I claim is:

1. In a vise, a body portion providing a slideway, a movable jaw on said slideway having a recess opening through its rear end and closed at its sides, a shaft journaled in said movable jaw to turn without transverse movement and extending through said recess, a pawl or ratchet on said shaft in the recess adapted to engage the slideway, the journal portions of said shaft and its pawl carrying portion being eccentric with respect to each other, and means at one end of said shaft outside the movable jaw for turning the same.

2. In a vise, a body portion providing a slideway, a movable jaw on said slideway having a recess opening through its rear end and closed at its sides, a shaft journaled in the side walls of said movable jaw to turn without transverse movement and extending through said recess, and a pawl or ratchet on said shaft in the recess adapted to engage the slideway, the journal portions of said shaft and its pawl carrying portion being eccentric with respect to each other and one end of the shaft projecting outside the movable jaw to receive a handle or lever for turning.

3. In a vise, a body portion providing a slideway, a movable jaw on said slideway having a recess opening through its rear end and closed at its sides, a shaft journaled in said movable jaw to turn without transverse movement and having an eccentric portion in said recess, a pawl or ratchet on said eccentric portion adapted to engage the slideway, and means at one end of said shaft outside the movable jaw for turning the same.

4. In a vise, a body portion providing a slideway, a movable jaw on said slideway having a recess opening through its rear end and closed at its sides and top, a shaft journaled in said movable jaw to turn without transverse movement and having an eccentric portion in said recess, a pawl or ratchet on said eccentric portion adapted to engage the slideway, and means at one end of said shaft outside the movable jaw for turning the same.

5. In a vise, a body portion providing a slideway, a movable jaw on said slideway having a recess opening through its rear end and closed at its sides, a shaft journaled in said movable jaw to turn without transverse movement and having an eccentric portion in said recess, a pawl or ratchet on said eccentric portion adapted to engage the slideway, and means at one end of said shaft outside the movable jaw for turning the same and for lifting the pawl into idle position.

6. In a vise, a body portion providing a slideway, a movable jaw on said slideway having a recess opening through its rear end and closed at its sides, a shaft journaled in said movable jaw to turn without transverse movement and extending through said recess, a pawl or ratchet on said shaft in the recess adapted to engage the slideway, the journal portions of said shaft and its pawl carrying portion being eccentric with respect to each other, means at one end of said shaft outside the movable jaw for turning the same and for lifting the pawl into

idle position, and a stop on the end wall of the movable member for limiting such turning and lifting.

7. In a vise, a body portion providing a slideway, a movable jaw on said slideway having a recess opening through its rear end and closed at its sides, a shaft journaled in said movable jaw to turn without transverse movement and extending through said recess, a pawl or ratchet on said shaft in the recess adapted to engage the slideway, the journal portions of said shaft and its pawl carrying portion being eccentric with respect to each other, means at one end of said shaft outside the movable jaw for turning the same, and a lateral projection on the pawl outside the movable jaw adapted to be engaged by said turning means when swung in one direction and release the pawl.

8. In a vise, a body portion providing a slideway, a movable jaw on said slideway having a recess opening through its rear end and closed at its sides, a shaft journaled in said movable jaw to turn without transverse movement and extending through said recess, a pawl or ratchet on said shaft in the recess adapted to engage the slideway, the journal portions of said shaft and its pawl carrying portion being eccentric with respect to each other, means at one end of said shaft outside the movable jaw for turning the same, a lateral projection on the pawl outside the movable jaw adapted to be engaged by said turning means when swung in one direction and release the pawl, and a stop on the movable jaw for limiting such movement of the pawl.

9. In a vise, a body portion providing a slideway, a movable jaw on said slideway having a recess opening through its rear end and closed at its sides, a shaft journaled in said movable jaw to turn without transverse movement and extending through said recess, a pawl or ratchet on said shaft in the recess adapted to engage the slideway, the journal portions of said shaft and its pawl carrying portion being eccentric with respect to each other, means at one end of said shaft outside the movable jaw for turning the same, a lateral projection on the pawl outside the movable jaw adapted to be engaged by said turning means when swung in one direction and release the pawl, and a stop on the movable jaw in the path of said projection for limiting such movement of the pawl.

MILTON E. WINANS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."