March 15, 1955 P. F. BEAUSOLEIL 2,704,002

RAPID-GRIPPING VISE

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Fig. 1

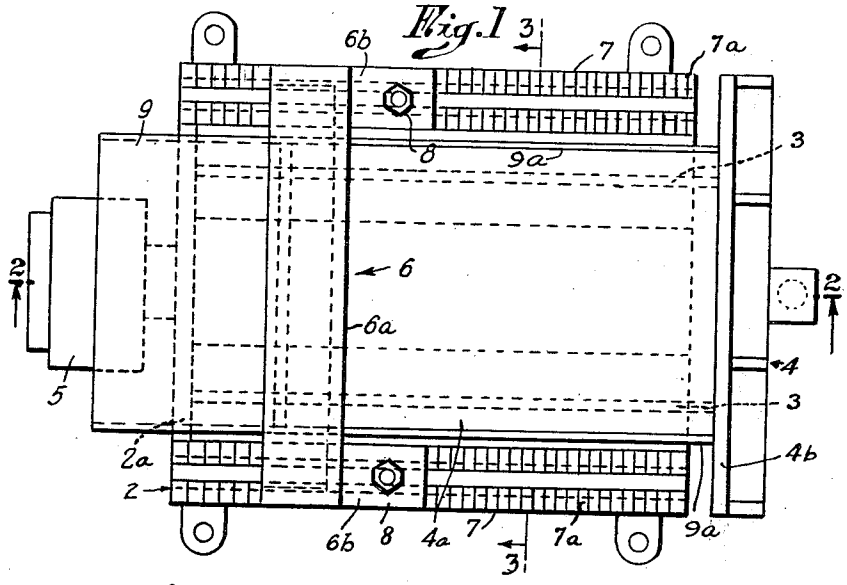


Fig. 2

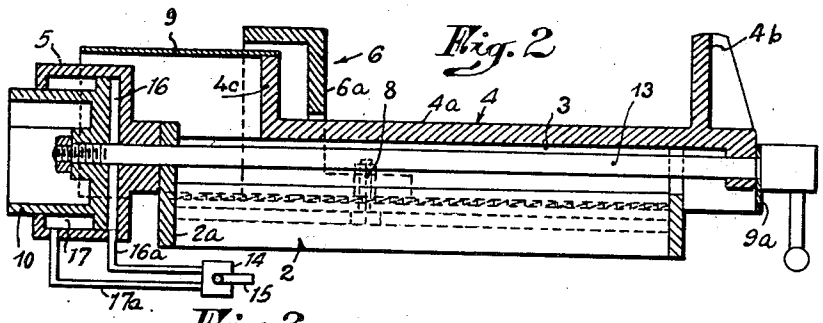
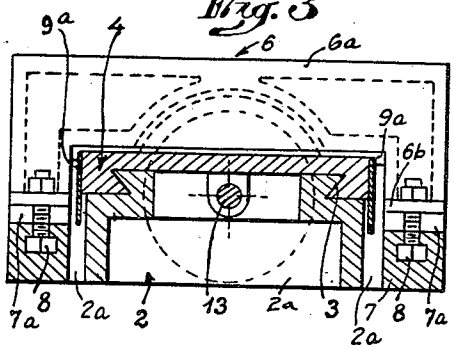


Fig. 3



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RAPID-GRIPPING VISE

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4 Claims. (Cl. 81—17.2)

This invention relates to rapid-gripping vises, and its objects include the provision of new and improved vise structures which have a reduced over-all length for a given amplitude of maximum opening between the vise jaws as compared to conventional vise constructions; the provision of a compact vise arrangement in which the operating slideways are substantially protected against the ingress of chips, filings and the like; and the provision of improved actuating arrangements for vises of this type. Other objects will appear as the description proceeds.

Vises for bench- or machine-work generally comprise a single slide track the total length of which corresponds to the sum of the lengths required for guiding the movable jaw member plus the length of useful stroke of said member, i. e. the amount by which said movable jaw can be spaced away from the cooperating fixed jaw. In vises where this useful stroke is large, a considerable over-all length is therefore required, greatly increasing the bulk of the vise. Moreover the protection of the sliding parts against the ingress of chips, filings and other dirt has always been difficult to accomplish.

According to the present invention, these difficulties are overcome and a compact and practical vise construction having a number of additional advantageous features is achieved by providing two pairs of parallel slideways, including an inner and an outer pair, a first movable vise member having a flat exposed table portion overlying, and slidable on, said inner slideways and a jaw table portion extending upwardly from said flat portion at one end thereof, and a second adjustably fixed vise member bridging said flat portion of the first member and movable relative thereto along said outer slideways and comprising a jaw portion cooperating with said jaw portion of the first member to hold a workpiece between said two jaw portions.

The first vise member which is freely slidable over the inner slideways is the movable jaw proper and may be connected to a suitable pressure operating device such as a hydraulic or pneumatic ram or cylinder whereby the jaw portion of said member may be rapidly brought into engagement with the workpiece. The second vise member movable along the outer ways is a semi-stationary or adjustably fixed jaw, in that it is intended to be displaced only for occasional adjustment and is held in its adjusted position on said outer ways, whereupon the jaw portion thereof serves as the stationary jaw of the vise.

Various other objects and advantages of the invention will become apparent upon reading the following specification together with the accompanying drawing forming a part thereof.

Fig. 1 is a plan view of a vise embodying the invention.

Fig. 2 is a longitudinal sectional view in elevation taken along the line 2—2 of Fig. 1, looking in the direction of the arrows.

Fig. 3 is a transverse sectional view taken along the line 3—3 of Fig. 1, looking in the direction of the arrows.

Referring to the drawings, a vise frame 2 comprises an inner pair of dovetail-shaped slideways 3 and an outer pair of slideways 7 which are laterally spaced from the inner slideways 3. The outer slideways 7 are parallel to the inner slideways 3. Freely slidably mounted on the inner slideways 3 is a first or movable vise member designated generally as 4 and which comprises an exposed flat table portion 4*a* located between the outer slideways 7. An upright movable jaw portion 4*b* is integrally

formed at the right hand end of the movable vise member 4. An upwardly extending transverse end wall 4*c* at the left of movable vise member 4 carries a dust shield or cover 9 for excluding dirt from left end portions of the inner guideways 3 where they would otherwise be exposed. Further protection of the inner guideways 3 against dirt is provided by a downwardly depending guard or skirt 9*a* which extends along the sides and across the front of the movable vise member 4.

A second, or adjustably fixed vise member designated generally as 6 comprises an adjustably fixed jaw portion 6*a* which cooperates with the movable jaw portion 4*b* of the movable vise member 4 in gripping a workpiece therebetween. The adjustably fixed vise member 6 is provided with downwardly extending leg portions which terminate in feet 6*b*, the feet 6*b* being displaceable along the outer slideways 7 by loosening bolts 8. The jaw portion 6*a* extends between the feet 6*b* transversely above the inner slideways 3 and upwardly above the exposed flat table portion 4*a* of the movable vise member 4 being spaced slightly above the table portion 4*a*. In order to hold the adjustably fixed vise member 6 securely positioned, and preventing movement of feet 6*b* along outer slideways 7, rack teeth 7*a* are shown formed on the upper surfaces of the outer slideways 7 and cooperate with similar teeth on the feet 6*b* so that the adjustably fixed jaw portion 6*a* can be placed at any desired one of a series of positions determined by the rack teeth. Any other means for holding the feet 6*b* securely positioned along the outer slideways 7 may be used, the rack teeth 7*a* being shown only by way of illustration. If desired a lead-screw or the like may be provided for adjusting the position of vise member 6 along the outer slideways 7.

Fixed to a left end wall 2*a* of the vise frame 2 is a fluid-actuated power cylinder 5 which has a piston 10 of relatively short stroke movably disposed therein. The piston 10 is connected by a tie rod 13 to the movable vise member 4. A control valve 14 comprising an operating handle 15 is connected to a suitable source of fluid under pressure (not shown). By manipulation of the handle 15, fluid under pressure may be admitted through a line 16*a* to the space 16 within the cylinder 5 to force the piston 10 to the left and draw the jaw portion 4*a* of movable vise member 4 to the left for gripping a workpiece. Similarly, manipulation of valve handle 15 to another position will admit fluid under pressure through a line 17*a* to the space 17 within the cylinder 5 to move the piston 10 toward the right for releasing the workpiece.

It will be understood that the teachings of the invention are applicable to vise constructions differing from the specific embodiment of the invention which is shown and described herein.

What I claim is:

1. A vise of the class described, comprising: a frame having coextensive parallel inner and outer slideway means; a first movable vise member comprising an exposed flat table portion on its upper surface, guide means on its lower surface extending over and covering said inner slideway means, and a jaw portion extending upwardly from one end thereof; a second vise member comprising a jaw portion movable over said exposed table portion and said outer slideway means; means for securing said second vise member in a desired position along said outer slideway means; and actuating means connected to said first vise member and to said frame for moving said first vise member toward said second vise member for gripping a workpiece between said two jaw portions, said outer slideway means being discrete and independent from said flat table portion, whereby stress upon said outer slideway is communicated directly to said frame, and not to said flat table.

2. A vise according to claim 1, wherein said jaw portion of said second vise member extends transversely across said flat exposed table portion of said first vise member, said second vise member comprising leg portions which extend downwardly from said jaw portion and straddle said exposed table portion for engagement with said outer slideway means, and said securing means comprising positively acting bolts connecting said legs and said outer slideway means.

3. A vise of the class described comprising, in combination: a frame member including laterally spaced parallel inner and outer slideway means; a movable vise member freely slideable along said inner slideway means and comprising an exposed flat horizontal table portion disposed between said outer slideway means and covering said inner slideway means, said movable vise member having guide means disposed beneath said exposed table portion and engaging said inner slideway means and a movable jaw portion extending upwardly from said table portion at one end thereof; an adjustably fixed vise member comprising an adjustably fixed jaw portion which extends transversely across said inner slideway means and upwardly above said exposed table portion of said movable vise member for gripping engagement with a workpiece resting on said exposed table portion between said movable and said adjustably fixed jaw portions, said adjustably fixed vise member engaging said outer slideway means for displacement therealong, said outer slideway means being of a length sufficient to permit movement of said adjustably fixed jaw portion to any desired position above said exposed table portion in accordance with the size of a particular workpiece to be gripped; means for securing said adjustably fixed vise member to prevent movement thereof along said outer slideway means; and

controllable gripping means rapidly operative through a relatively short stroke and acting on said frame member and on said movable vise member for forcing said movable jaw portion toward said adjustably fixed jaw portion to grip a workpiece therebetween.

4. A vise according to claim 3, further comprising dust shield means extending over those portions of said inner slideway means not covered by said movable vise member in all positions thereof.

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