Feb. 20, 1945. J. JESIONOWSKI 2,370,042

VISE

Filed Nov. 20, 1940

Fig. 1.

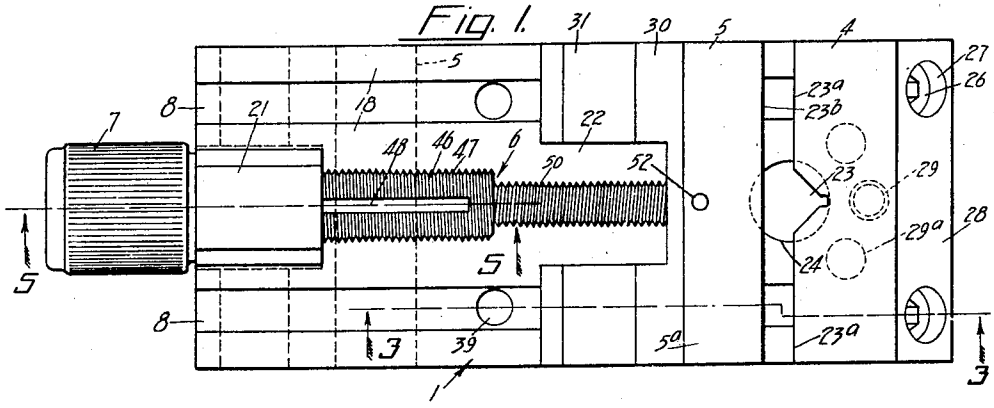


Fig. 2.

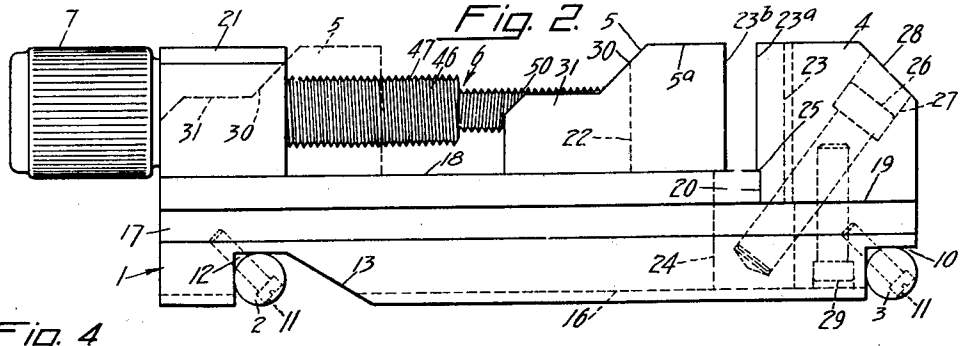


Fig. 4

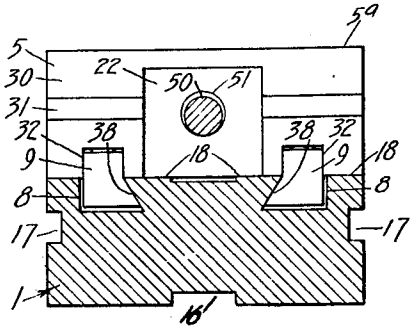


Fig. 3.

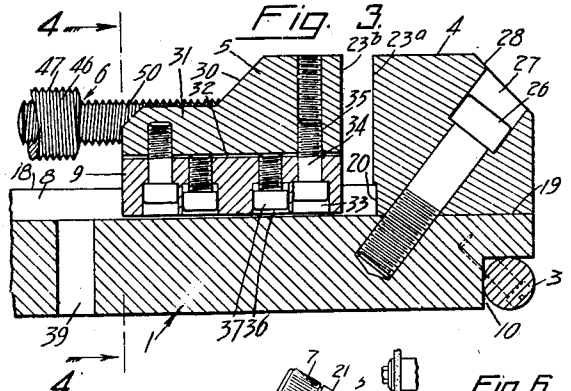


Fig. 5.

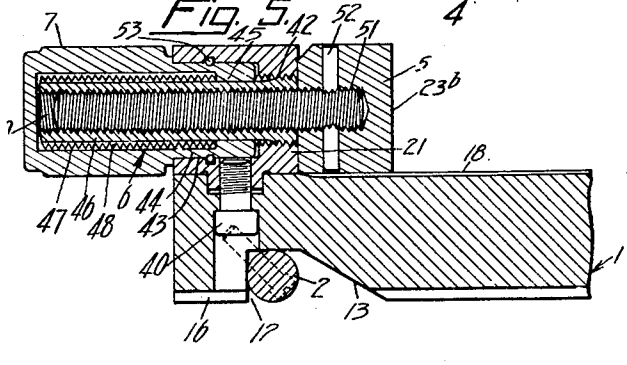
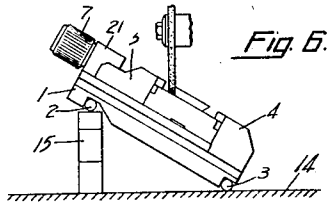


Fig. 6.



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Patented Feb. 20, 1945 2,370,042

UNITED STATES PATENT OFFICE

2,370,042

VISE

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Application November 20, 1940, Serial No. 366,455

2 Claims. (Cl. 81—33)

My invention relates to vises.

It has among its objects to provide an improved device adapted to hold work at a selected angle during grinding. A further object of my invention is to provide an improved sine vise having improved work holding elements and improved adjusting means for the movable element thereof, whereby when the device is disposed as a sine bar, it is adapted to hold work thereon at the proper angle relative to a grinding wheel. Other objects of my invention are to provide improved means for obtaining a substantial range of movement for the movable element, and improved adjustable guide means for guiding said element in its movement into and out of work clamping position. Still other objects are to produce such an improved construction which is exceedingly convenient, simple, and rugged and which is also adapted to be produced with precision at moderate cost. These and other objects and advantages of my improvements will, however, hereinafter more fully appear.

In the accompanying drawing, I have shown for purposes of illustration one embodiment which my invention may assume in practice.

In this drawing:

Figure 1 is a top plan view of this form of my improvement;

Fig. 2 is a side elevation of the same;

Fig. 3 is a section on line 3—3 of Figure 1;

Fig. 4 is a section on line 4—4 of Figure 3;

Fig. 5 is a section on line 5—5 of Figure 1, with the movable jaw fully open, and

Fig. 6 is an elevation showing one arrangement of the vise during use thereof.

In this illustrative construction, I have shown a vise including a base, generally corresponding to a sine bar and indicated at 1, and having usual rolls 2 and 3 fixed thereto, and also carrying on said base a fixed jaw 4 and a movable jaw 5 movable relative thereto longitudinally of the base 1 by telescopic threaded connections, generally indicated at 6, which are actuated by a turning member 7; the various elements of this construction being improved as hereinafter more fully appears.

Referring more particularly to the base 1, it will be noted that the same comprises a metal block of substantial depth and width, as shown in Figure 4, and having a solid center between longitudinally extending oppositely disposed dovetail grooves 8 on its upper surface, in such manner as thereby to provide a rigid support and guide for cooperating dovetail guides 9 carried on the movable jaw 5, as hereinafter described.

It will further be noted that this base is transversely cut away at one end, as indicated at 10, to receive and suitably expose the roll 3 which is suitably attached to the base in this notch by angularly directed screws 11. As shown, the base 1 is also provided with a transverse cut away portion or slot 12 wherein the roll 2 is disposed and attached by similar screws 11, this portion 12 being spaced from the opposite extremity of the base, as illustrated in Figure 2, and also having an inclined wall 13 to expose the roll 2 as necessary. Thus, for example, as shown in Figure 6, the base 1 may have its roll 3 supported on and connected to a magnetic chuck face, indicated at 14, while the base is supported on spacer blocks 15 carried on the face 14 and disposed under the roll 2 and of such height as to position the base at the desired angle. Here it will be evident that suitable grooves, as for example, a bottom groove 16 and side grooves 17, may be provided for use in connecting the base to any other suitable support, without reducing the rigidity of the base. As shown herein, the base 1 is also provided with a smooth top face forming a support for the bottom face of the movable jaw 5, finished surfaces 18 being provided on opposite sides of the grooves 8 to permit free movement. Herein, it will also be noted that a lower parallel surface 19 is provided at the end of the base overlying the roll 3 in such manner as to provide a support for the stationary jaw 4 and a right angled abutment 20 for the inner end of the jaw. As shown, the adjacent surfaces 18 at the opposite end of the base and above the roll 2 also provide a support for an upstanding post 21 through which the threaded connections 6 extend and which is receivable in a corresponding cut out portion 22 provided in the movable jaw 5.

Referring more particularly to the stationary jaw 4 carried on the base 1, it will be noted that this jaw is provided with a centrally located vertically disposed notch 23 disposed above a larger vertical recess 24 in the base 1 and having equal diverging sides at right angles to one another, in such manner as to produce effective work locating means for round pieces of work while enabling longer pieces of work to extend as desired into the recess 24 in the base. Further, it will be noted that transverse vertical work engaging faces 23a are provided on opposite sides of the notch 23, which extend from the top of the member 4 to the top of the abutment 20, while a shoulder 25 is provided overlapping the abutment 20 on the base 1. As shown, the jaw 4 is also suitably attached to the base 1 by angularly disposed screws 26 in-

serted through sockets 27 in a beveled portion 28 on the back of the member 4 and at opposite ends of the latter. In a preferred construction, a central vertical screw 29 having its head countersunk in the bottom of the base, herein in longitudinal groove 16, is also provided to cooperate with screws 26 in clamping the member 4 rigidly to the base 1, while suitably spaced dowels 29a on opposite sides of the screw 29 are also provided to insure positive location of the jaw 4 to the base 1. Thus, it will be apparent that the jaw 4 provides a very rigid and satisfactory work abutment or stationary jaw adapted to engage or center work between its faces 23a and the opposing face of the movable jaw.

Referring more particularly to the movable jaw 5, it will be observed that the same herein is provided with a continuous transverse vertical face 23b adapted to cooperate with the faces 23a on the member 4 and engage the opposite face of work clamped between these faces. As shown, the member 5 is provided with a rearwardly and downwardly sloping portion 30 leading from its top to lower spaced rearward projections 31 on opposite sides of the central cut away portion 22 and providing an elongated bottom surface on the member 5. Herein, longitudinal grooves 32 of like rectangular cross section are provided along opposite sides of the elongated bottom of the member 5, these grooves being preferably of slightly less width than the top of the dovetail grooves 8. Within each of these grooves 32, upper portions of corresponding cross section on the dovetail guides or gib blocks 9 are received, as shown in Figure 4, while it will also be noted that these guides 9 are provided with sockets 33 at their opposite ends in which are disposed headed adjusting screws 34 threaded at 35 into the tops of the grooves 32. Herein also, other sockets 36 are provided in the guides or gib blocks 9 longitudinally spaced from one another and between the screws 34 to receive shorter countersunk adjusting screws 37 having their ends engaging the tops of the grooves 32. Thus, it will be evident that the beveled or dovetail guides 9 can be adjusted as desired relative to the dovetail grooves 8 by suitable adjustment of the screws 34, 37 in such manner as to effect any desired vertical or lateral adjustment of the beveled surfaces 38 on the inner surfaces of these guides relative to the corresponding beveled surfaces provided on the inner surfaces of the dovetail grooves 8; all in such manner as to insure the desired contact of the jaw 5 with the surfaces 18 while maintaining the desired angular and transverse location of the jaw and permitting the latter to move freely longitudinally. Moreover, it will be observed that suitable apertures 39 are also provided in the bottoms of the grooves 8 substantially midway between the limits of movement of the jaw 5 in such manner as to permit adjustment of any selected screw from the bottom face of the base 1 whenever the jaw 5 is so moved longitudinally of the base as to bring the selected screws into registry with the apertures 39.

Referring to the adjusting mechanism for the movable jaw 5, it will be noted that the post 21 provides an abutment for the threaded connections 6 and is, accordingly, suitably fixed to the base 1, herein by means of a central screw 40 insertable through the bottom of the base. As shown, the post 21 is also centrally longitudinally threaded at its inner end at 42 and provided with an enlarged mouth 43 leading from these threads toward the turning member or nut 7. Herein, the latter is also provided with a sleeve 44 of reduced cross section thereon extending into this mouth and this sleeve 44 is provided with oppositely located longitudinal integral keys 45. Cooperating with the threads 42 and these keys 45 is also a sleeve 46 having external right hand threads 47 engaging the threads 42 and longitudinal keyways 48 receiving the keys 45, thereby enabling the sleeve 46 to be fed longitudinally with the threads 42 in either direction as the turning member or nut 7 is rotated. As shown, the sleeve 46 is also provided with internal left hand threads 49 throughout its length cooperating with like threads on a coaxial screw 50 which is suitably threaded in a central recess 51 in the movable jaw 5 at the right-hand end of the cut away portion 22 while also being anchored against rotation relative to this recess by a transverse pin 52. Thus, when the turning member or nut 7 is rotated in a clockwise direction from the left hand end of the base 1, the sleeve 46 will move out of the base 21 toward the right from the position shown in Figure 5 and into the position shown in Figure 1, while the screw 50, being a left hand thread, will aso move to the right relative to the sleeve 46 in such manner as thereby to move the movable jaw 5 rapidly from the position shown in Figure 5 to that shown in Figure 1. Conversely, when the member 7 is moved in a counterclockwise direction, the parts will move from the position shown in Figure 1 to the telescoped position thereof shown in Figure 5.

It will also be noted that the construction is such that the member 7 may be withdrawn longitudinally whenever desired in such manner as thereby to prevent meddlers from changing the position of the jaw 5, a split spring ring 53 surrounding the sleeve 44 and seated in suitable opposite annular grooves in the latter and the post 21 herein also providing a detent which, while normally preventing accidental withdrawal of the member 7, permits the latter to be withdrawn whenever desired and also insures accurate longitudinal location of the same whenever reinserted.

In the use of my improved construction, it will be evident that when the work is placed against the stationary jaw 4, the movable jaw 5 may be readily and quickly moved into clamping relation by suitable rotation of the turning member 7 in such manner as thereby to enable the work to be disposed at the proper angle to a grinding wheel. Further, it will be apparent that the work when completed may be similarly released by a reverse operation of the turning member, and new work thereafter inserted with a minimum of loss of time, due to the facility with which these operations can be performed and the rapid movement of the movable jaw made possible through the right and left hand screws provided. Moreover, through the provision of the cut away portion on the movable jaw, it will be evident that a maximum range of opening thereof is obtained for any given length of the base 1.

As a result of the use of my improved construction, it is made possible materially to facilitate and expedite various grinding operations, due to the facility with which the work can be clamped or released from the improved work holder provided. Thus, by varying the angle of the base 1 shown in Figure 6, as by changing the number of spacing blocks to correspond with the sine of the desired angle, the angular relation of the work to the grinding wheel may be varied as desired. Also, the base 1 may be placed flat

on any selected supporting surface, as, for example, on the grinding machine or other machine when the device is used, for ordinary flat or surface grinding or any other operation desired to be performed on the work.

While I have in this application specifically described one embodiment which my invention may assume in practice, it will be understood that this form has been shown for purposes of illustration, and that the invention may be modified and embodied in other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a vise, the combination of a base plate, a member secured to said base plate adjacent one end of the latter and projecting upward from the base plate to serve as a fixed jaw, a movable jaw member opposing the fixed jaw member, means for moving the movable jaw member lengthwise of the plate, the plate having a smooth horizontal upper surface and the movable jaw having a smooth horizontal lower surface overlying and facing said last-named surface, the plate being provided on opposite sides of a longitudinal median line with longitudinal grooves extending to its upper surface, and the movable jaw member being provided with longitudinal grooves registering with the respective first-named grooves and extending to its lower surface, the mouth portions of the grooves in the base plate being of substantially the same width as the mouth portions of the grooves in the movable jaw but said first grooves being undercut at the sides thereof which are disposed toward said median line, a pair of gib blocks each of which is located partly in one of the plate grooves and partly in one of the movable jaw grooves and has a wedging face cooperating with the undercut portion of the corresponding plate groove, and means for adjusting each gib block vertically comprising screws threaded into the movable jaw member and adapted to raise the block and screws threaded into the gib block and having their ends abutting the movable jaw and adapted to lower the block.

2. In a vise, the combination of a base plate, a member secured to said base plate adjacent one end of the latter and projecting upward from the base plate to serve as a fixed jaw, a movable jaw member opposing the fixed jaw member, means for moving the movable jaw member lengthwise of the plate, the plate having a smooth horizontal upper surface and the movable jaw having a smooth horizontal lower surface overlying and facing said last-named surface, the plate being provided on opposite sides of a longitudinal median line with longitudinal grooves extending to its upper surface, and the movable jaw member being provided with longitudinal grooves registering with the respective first-named grooves and extending to its lower surface, the mouth portions of the grooves in the base plate being of substantially the same width as the mouth portions of the grooves in the movable jaw but said first grooves being undercut at the sides thereof which are disposed toward said median line, a pair of gib blocks each of which is located partly in one of the plate grooves and partly in one of the movable jaw grooves and has a wedging face cooperating with the undercut portion of the corresponding plate groove, and means for adjusting each gib block vertically comprising screws threaded into the movable jaw member and adapted to raise the block and screws threaded into the gib block and having their ends abutting the movable jaw and adapted to lower the block, all said screws having operating heads disposed in sockets at the lower face of the corresponding gib block and the base plate having perforations therethrough in line with the grooves in the base plate, each perforation giving operating access to the heads of all of the screws of the corresponding gib block as the movable jaw is shifted lengthwise of the vise.

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