May 9, 1950 R. WAGNER 2,507,288

STRAIGHT BEAM ADJUSTABLE JAW TYPE VISE

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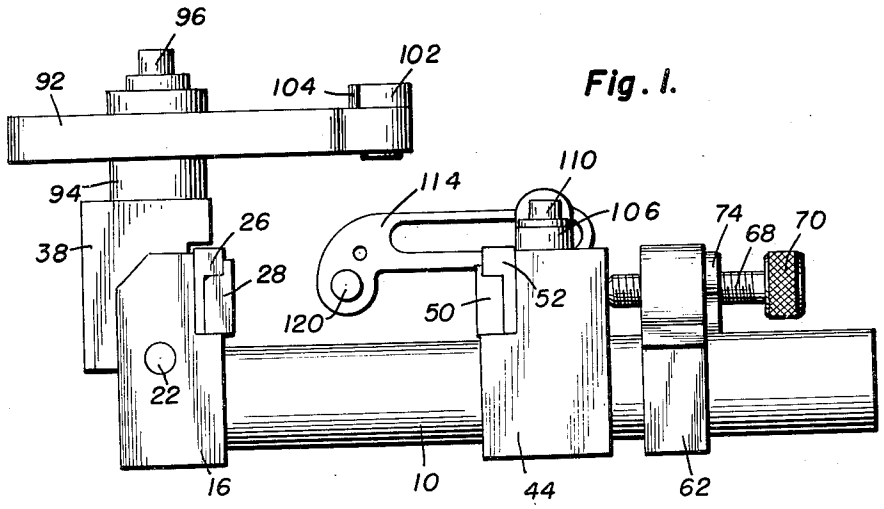


Fig. 1.

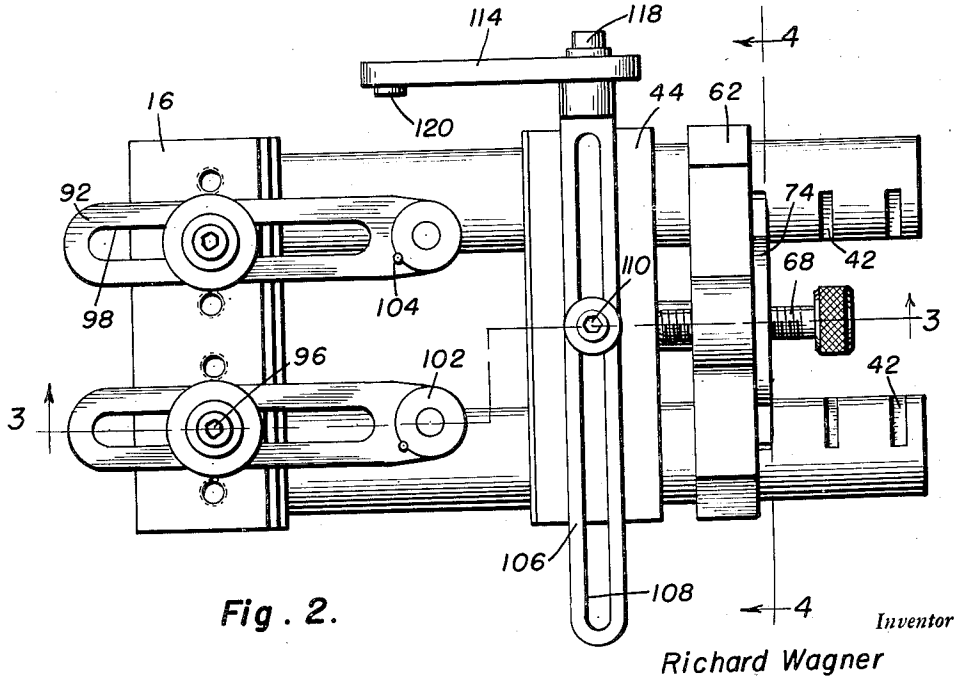


Fig. 2.

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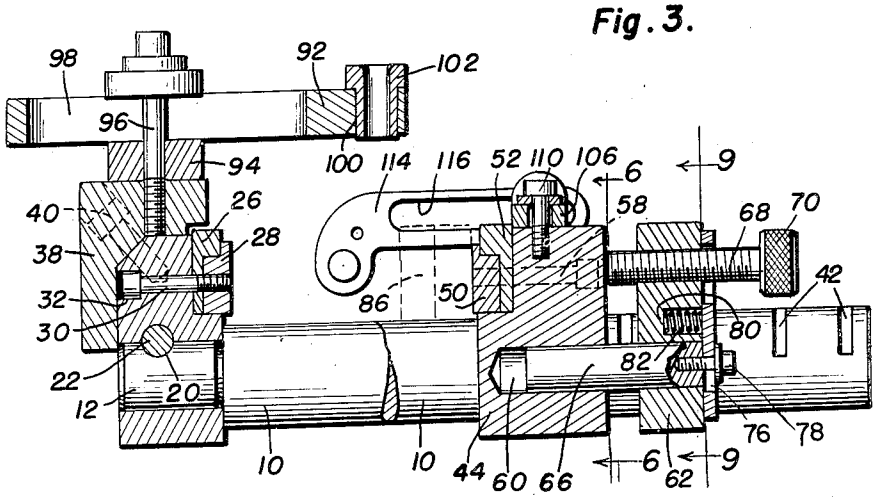
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STRAIGHT BEAM ADJUSTABLE JAW TYPE VISE

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Fig. 3.



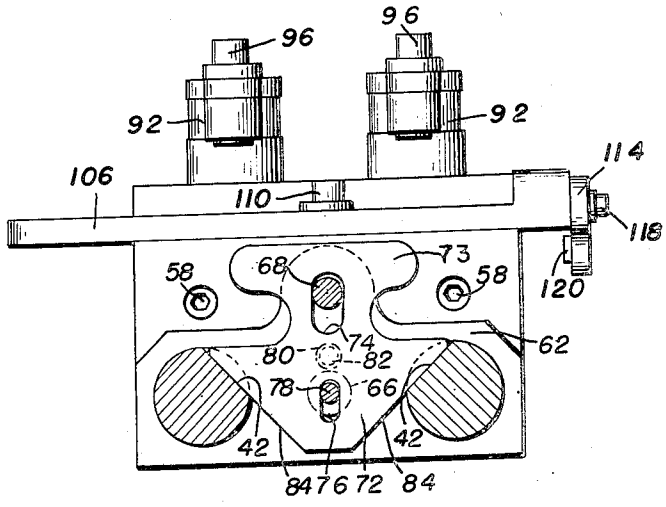


Fig. 4.

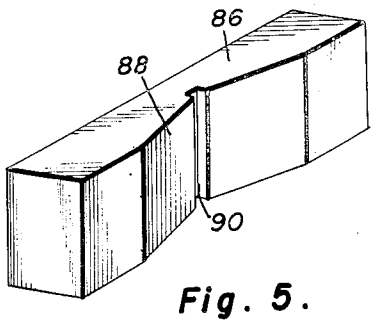


Fig. 5.

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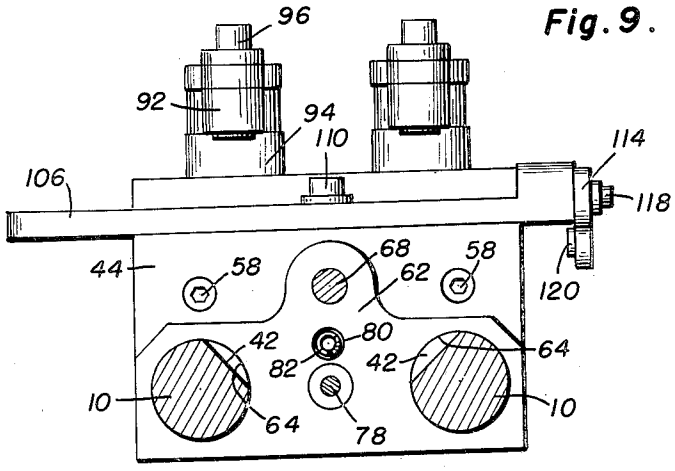
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Fig. 9.



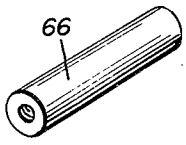


Fig. 10.

Fig. 7.

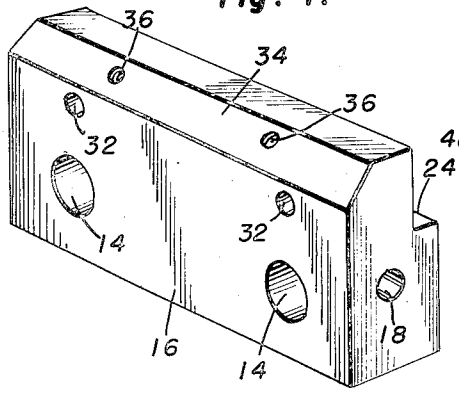


Fig. 8.

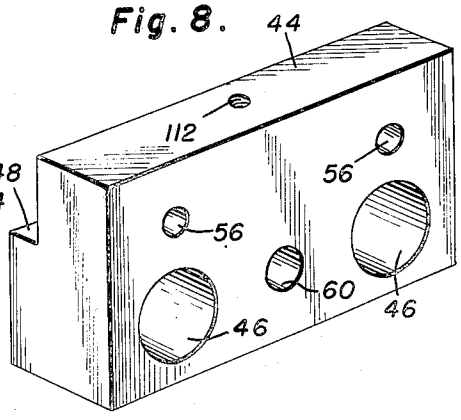
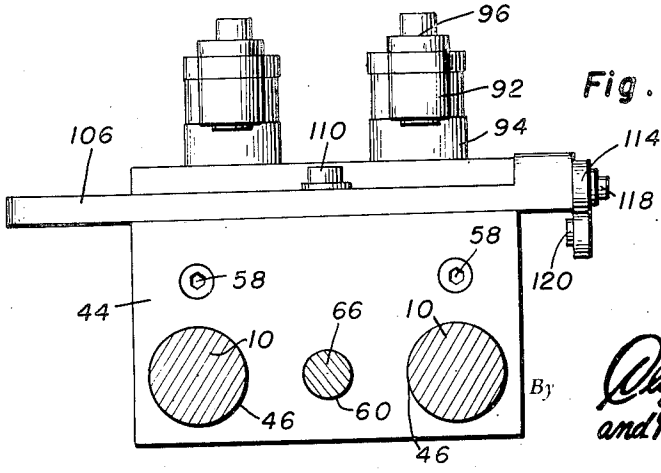


Fig. 6.



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UNITED STATES PATENT OFFICE

2,507,288

STRAIGHT BEAM ADJUSTABLE JAW TYPE VISE

Richard Wagner, Flint, Mich.

Application March 31, 1947, Serial No. 738,331

3 Claims. (Cl. 144—303)

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This invention comprises novel and useful improvements in a vise and more specifically pertaining to a combined vise and jig for securely holding and supporting in a variety of positions, various articles for machining or other work thereon.

The principal purposes of this invention reside in providing a vise having successively operable adjusting means for quickly positioning the movable vise jaw at a selected one of a plurality of adjustable positions and subsequently providing a clamping action of the jaws upon a piece of work.

An additional purpose of the invention is in providing a device having an improved construction of movable and fixed jaws to thereby improve the security of the gripping action, the easy manipulation, and the life of the instrument.

Yet another important object of the invention consists of providing a device which shall be particularly adapted for use as a jig in mass production methods of machining articles, wherein a wide variety of shapes of articles may be securely gripped thereby and held in predetermined positions for performing machine operations thereon; wherein a variety of attachments may be readily applied to the vise for augmenting its usefulness; and wherein an instrument is provided for quickly securing the article in the desired position therein for machining or servicing of the same.

Another important purpose of the invention consists in providing an improved adjusting means for the vise jaws, which shall facilitate an adjustment thereof; wherein the vise may be released from its locked position by manipulation of one of the adjusting means only; and wherein a highly improved means is provided for selectively effecting an approximate adjustment of the device and a final adjustment thereof for gripping and positioning an article therein.

These, together with various ancillary objects of the invention which will later become apparent as the following description proceeds, are attained by this device, a preferred embodiment of which has been illustrated, by way of example in the accompanying drawings, wherein:

Figure 1 is a side elevational view of the improved vise in accordance with this invention, certain attachments being shown applied thereto;

Figure 2 is a top plan view of the arrangement of Figure 1;

Figure 3 is a vertical longitudinal sectional

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view taken substantially upon the broken section line 3—3 of Figure 2;

Figure 4 is a transverse vertical sectional view taken substantially upon the section line 4—4 of Figure 2 and particularly illustrating the latch construction of the device;

Figure 5 is a perspective view of a pipe holding jaw attachment for the device;

Figure 6 is a transverse vertical sectional view taken substantially from the section line 6—6 of Figure 3 and illustrating particularly the movable jaw of the device;

Figure 7 is a perspective view of the fixed jaw of the device;

Figure 8 is a perspective view of the movable jaw of the device;

Figure 9 is a transverse vertical sectional view taken substantially from the section line 9—9 of Figure 3; and

Figure 10 is a perspective view of a supplemental guiding means for the movable jaw.

Referring now more specifically to the annexed drawings, wherein like numerals indicate similar parts throughout the various views, it will be apparent that the device consists of a pair of guide rods 10 which are preferably of cylindrical shape, and which as shown in Figure 3 are provided with a reduced extremity 12 at one end thereof. The pair of guide rods 10 are disposed in parallel relation and have their reduced extremities received in parallel bores 14 in the fixed jaw member 16.

The fixed jaw member 16 is of generally rectangular shape and is provided with a laterally extending bore 18 which is disposed transverse to and intersects the bores 14, and also registers with semi-cylindrical grooves 20 formed upon the upper surface of the reduced portion 12 of the guide rods 10. A key or locking pin 22 preferably formed as a rod or cylindrical peg, is tightly received in frictional engagement in the transverse bore 18, and extends through the above mentioned parallel bores 14 and is seated in the semi-cylindrical grooves 20, to thereby retain the guide rods 10 in rigid and non-rotatable position in the fixed jaw 16.

Upon its inner face, that is the face on the side toward the guide rods 10, the fixed jaw is provided with a shoulder seat 24 which may be employed to detachably seat and receive a variety of vise jaw attachments, or jig fixtures as desired, such for example as a pair of replaceable jaw members 26 and 28, which, as shown in Figure 3, are detachably retained upon

the fixed jaw by a detachable fastening means such as a bolt 30 extending through the jaw in a suitable bore, and having its head countersunk in a recess 32 at the outer surface of the jaw.

The rear face of the fixed jaw 16 is beveled transversely of its upper surface as at 34 and is provided with threaded bores therein as at 36, whereby a correspondingly shaped attachment 38 may be secured thereto as by a detachable fastening bolt 40, countersunk therein as indicated at Figure 3.

It is to be distinctly understood that various attachments and accessories may be secured to the fixed jaw 16 in order to assist the positioning and supporting work in the vise, to provide stops, guides, templates or gages to assist in performing the machine operations upon articles secured in the device, as may be found expedient.

As shown thus in Figures 2, 4, 3 and 9, the parallel guide rods 10 are provided with a plurality of longitudinally spaced notches 42 at selected intervals thereon. These notches are arranged in pairs, oppositely disposed upon adjacent surfaces of the parallel rod 10. These notches provide predetermined positions of adjustment for the movable jaw upon the guide rods 10. The movable jaw, as shown in Figure 8, consists of a generally rectangular block 44 provided with parallel bores 46 slidingly receiving the guide rods 10, and further provided upon its upper portion of its inner space with a shoulder seat 48 similar in construction and purpose to the corresponding seat 24 of the fixed jaw 16. A variety of detachable vise accessories, selectively forming jaws, article holding attachments of specific shapes and designs, jigs or the like, and indicated generally as cooperating members 50 and 52 in Figure 3, are detachably seated in the shoulder portion 48, and retained therein as by fastening bolts 54 extending through suitable bores 58 in the movable jaw. As best shown in Figures 3 and 6, the movable jaw 44 is provided upon its rear face, that is the surface on the opposite side of the jaw from the fixed jaw, with a cylindrical guide bore 60 which is parallel to and substantially intermediately spaced relative to the guide rods 10 and bores 46.

As so far described, it will thus be seen that the jaw 44 is adapted to freely slide upon the guide rods 10 towards and from the fixed jaw 16, in order to position, engage and clamp articles therebetween in a manner to be now set forth.

As shown best in Figures 3 and 9, a generally rectangular movable abutment box 62 is adapted for free sliding movement upon the parallel guide rods 10 by means of the guide bores 64. As shown best in Figure 3, the movable abutment 62 is provided with a guiding end or cylinder 66 suitably secured in a socket or bore therein, and extending forwardly thereof for engagement with the guide bore 60 of the movable jaw 44. It will thus be seen that the movable jaw 44 and the movable abutment 62 are guided by the sliding engagement on the parallel guide rods 10 and also by the sliding guide pin and bore 66 and 60 carried by these movable members.

As will be clearly seen by reference to Figures 3, 4, and 9, the movable abutment is provided intermediate its sides with an upwardly extending boss or extension which is provided with a threaded bore adjustably receiving the bolt 68 having a knurled adjusting head. The end of this bolt is adapted to engage the adjacent surface of the movable jaw to clamp or adjust the latter relative to the movable abutment 62. It will be noted that during the manipulation of the adjusting screw 68, the guide pin 66 exerts a compensating effect upon the movable jaw, preventing the same from being cocked upon the guide rods 10, thereby contributing to the ease of adjustment.

In order to make a quick, approximate adjustment of the movable abutment and of the movable jaw, a latching means is provided which is more clearly shown in Figures 2, 3 and 4. A generally triangular latch plate 72 is provided having a T-shaped upper extremity 73 whose laterally extending arms constitute finger grip portions for manipulating the latch plate. Vertically elongated slots 76 and 74 are provided in the T-shaped portion and in the lower portion of the latching plate 72, for respectively receiving the adjusting screw 68 and retaining screw 78 having a cover for retaining the latching plate to the outer plate of the movable abutment, this screw being shown as engaging the outer extremity of the fixed guide end 66.

The retaining bolt 78 is preferably adjusted with sufficient tightness to snugly and firmly retain the latching plate 72 upon the outside face of the movable abutment 62, but to allow vertical adjusting movement of the latch plate upon the abutment in a manner to be now set forth. The outer surface of the movable abutment is provided with a socket or recess 80 receiving a coil spring 82 for exerting a constant tension outwardly against the latch plate, whereby to bias the latter into frictional engagement with the fastening bolt 78, whereby the latch plate will be yieldingly held in the vertically adjusted position into which it is manually placed.

The outer edges of the triangular shaped latch plate are appropriately inclined, as at 84, to fit the correspondingly shaped notches 42 for removable latching engagement therewith.

It may thus be seen that when the latching plate 72 is elevated by means of the finger grip 73, which upward movement is permitted by means of the elongated slots 74 and 76 sliding over the shank of the bolts 68 and 78, the latching edges 84 are withdrawn from the latching slots 42, whereby the movable abutment 62 may be freely moved longitudinally of the guiding rods 10. At the same time, the movable jaw 44 is likewise free to move except as limited by engagement with the adjusting screw 68. Obviously, the movable abutment and movable jaw may be readily moved manually into the approximate positions of adjustment desired, whereupon the latching means may be reengaged with the appropriate latching notch 42. By this means a quick approximate adjustment of the movable jaw may be effected. When this approximate adjustment has been attained, the adjusting screw 68 is manipulated to apply pressure to the movable jaw, for adjusting and locking the same, the movable abutment 62 being now secured in a predetermined position by engagement of the latch with the notches 42. Obviously, by merely withdrawing the latch 72, the abutment and jaw may be quickly released from the article which they are engaging.

A tight holding attachment is associated with the guide rods and comprises a generally rectangular block 86 whose forward face is provided with a generally V-shaped recess 88 and at the end thereof, of the apex of the V-shaped recess a channel or further cut away as at 90. Obvious-

ly, one or a pair of these jaw inserts may be freely placed and rest upon the longitudinally extending guide rods 10, in a transverse position, and they have their rear surface abuting with the adjacent surface of the jaws.

It is further contemplated that the utility of this instrument may be augmented by the addition of any desired accessories for adapting the device for use as a jig or the like. For example, as shown in Figures 1 and 3, one or more guide members 92 may be adjustably secured upon the fixed jaw 16 by means of spacing collars 94, and retaining bolts 96. Preferably, the members 92 are provided with elongated longitudinally extending slots 98, whereby the members may be adjusted in any desired position upon the fixed jaw, and these members may support at their extremities as by means of cylindrical bores 100, any one of a graduated series of drill guide bushings 102, the cylindric bushing being retained as by a fastening pin 104. Obviously, as articles are held in the vise, the proper adjustment of member 92, and the proper choosing of the bushing 102, will permit the guiding of a drill or like tool in predetermined position upon the article so held.

A supporting bar or arm 106, principally longitudinally slotted as at 108 is adjustably retained upon the movable jaw as by a fastening bolt 110 engageable in a threaded bore 112. Adjustably secured upon the angulated or upstanding end of the supporting arm 106, is a bar 114 having an elongated adjusting strap 116 by which the bar is raised and retained upon the supporting arm by a fastening bolt 118.

At its inner end, the arm 114 is provided with a laterally extending projection 120 constituting a stop for positioning work laterally of the jaws.

Obviously, by means of the foregoing attachment a great variety of articles may be suitably positioned in any desired manner between the jaws for the operation thereon and may be quickly released when the operation is finished.

From the foregoing, it will be readily perceived that there has been described a device which is capable of attaining the various objects set forth and many others of great practical importance, and since numerous other modifications will readily occur to those skilled in the art, after consideration of the attached specification and drawings, it is not intended to limit the invention to the exact construction shown and described, since all suitable modifications and equivalents may be resorted to falling within the scope of the appended claims.

What is claimed as new is as follows:

1. A vise comprising a plurality of spaced guide members, a fixed jaw detachably secured to said guide members, a movable jaw having openings slidably receiving said guide members, an abutment having openings slidably receiving said guide members, said guide members having inner opposed surfaces, a plurality of longitudinally spaced notches provided in the inner opposed surfaces of said guide members, an adjusting bolt carried by said abutment and bearing against said movable jaw for spacing the latter relative to the former, a latch plate having two spaced and vertically extending slots, said adjusting bolt extending through one of said slots, a headed fastening bolt extending through the other of said slots and retaining said plate against said abutment, means exerting a constant tension outwardly against the latch plate for biasing the latter into frictional engagement with the head of said fastening bolt whereby the latch plate will be yieldingly held in an adjusted position into which it is manually placed, said latch plate having inclined edges received in selected of said notches, and interconnecting means between said abutment and said movable jaw preventing the inner walls of the openings in said movable jaw from binding against the guide members.

2. The combination of claim 1 and shoulder seats provided on said jaws, a pair of jaw members associated with each of said jaws and positioned on said seats, and means removably securing said jaw members to said jaws.

3. In combination with a vise including a pair of guide rods and a fixed member and a movable member mounted thereon, a movable abutment slidable on said guides and engaging said movable member for limiting movement thereof, spaced notches in said guide rods, and a triangular latch plate including finger engaging portions secured to said abutment and received in said notches for limiting movement of said abutment, said abutment and said movable member including complementary bores, a pin extending through said bores and retained in position for axial movement by said abutment, said plate having two spaced and vertically extending slots, an adjusting bolt extending through one of said slots, said abutment having a threaded opening receiving said adjusting bolt and said adjusting bolt extending through said abutment and bearing against said movable member, a headed fastening bolt extending through the other of said slots and retaining the plate against the abutment, and a spring yieldingly urging said latch plate into frictional engagement with said fastening bolt.

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