Dec. 26, 1950 C. E. O'MALLEY 2,535,450

VISE TYPE FIXTURE HAVING TWO PAIRS OF JAWS

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Fig. 1.

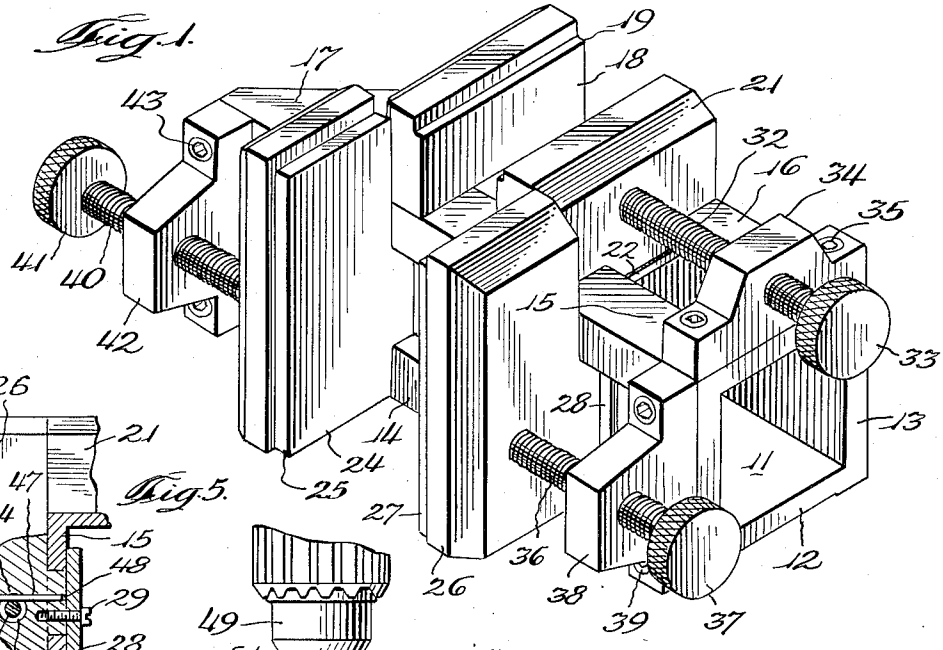


Fig. 5.

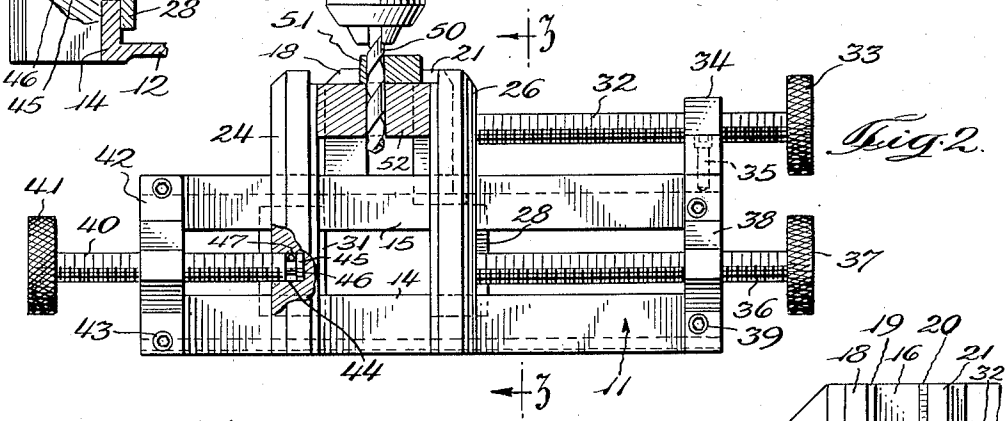


Fig. 2.

Fig. 3.

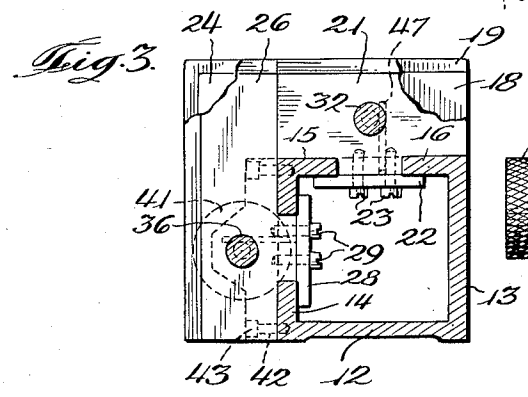
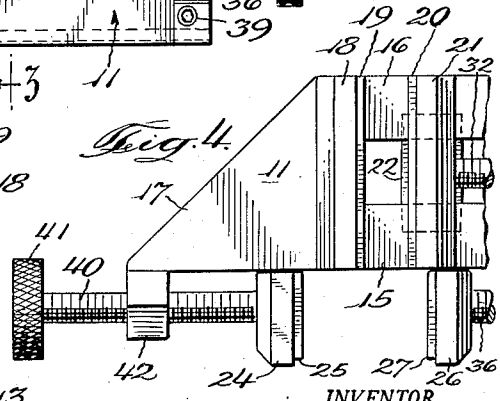


Fig. 4.



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VISE TYPE FIXTURE HAVING TWO PAIRS OF JAWS

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5 Claims. (Cl. 81—33)

1

This invention relates to a vise type fixture and has for one of its objects the provision of a fixture which is capable of positioning and clamping two or more pieces of material of the same or different shapes, or a single irregularly shaped piece of material, in a position for doing work thereon. The fixture is useful, for example, for drilling, reaming or tapping two or more pieces in one operation when an aligned hole or tap in the two pieces is desired. The fixture, however, has many other uses, as will be apparent to those skilled in the art.

Heretofore, when two or more pieces of similarly or dissimilarly shaped material were to be drilled, reamed or tapped, it was necessary to use two or more hand clamps. It is difficult to handle the hand clamps and the fittings to assemble the pieces, and the hand clamps ofttimes do not hold the pieces in proper position when the tool is applied to the work.

It is, therefore, an object of the invention to provide an improved vise type fixture to retain two or more pieces of material together, of the same or different shape and to dispense with the use of common hand clamps for this purpose.

It is also an object of the invention to provide a fixture of the type described, wherein one or more of the pieces to be worked upon may be clamped and held in position independently of one or more other pieces which are to be simultaneously worked upon.

It is an additional object of the invention to provide a vise type fixture in which the pieces to be worked upon may be readily positioned or aligned, if alignment is required.

It is a further object of the invention to provide a fixture which has three movable or adjustable plates or jaws and one fixed plate or jaw, which cooperates with one of the movable jaws.

It is also an object of the invention to provide a fixture having two jaws or plates extending at substantially right angles to two other jaws or plates; and specifically to provide for movement of three of the jaws.

It is an additional object of the invention to provide a vise type fixture which may be disposed in two positions 90° removed on the bed of a machine or on stilts.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in the claims and illustrated in the accompanying drawings, wherein:

2

Figure 1 is a perspective view of the improved vise type fixture;

Figure 2 is a side view of the fixture with parts thereof in section, and illustrates a drill and head with two pieces of material in section held by the fixture;

Figure 3 is a vertical sectional view of the fixture showing some of the parts broken away, and is taken on line 3—3 of Figure 2;

Figure 4 is a partial top plan view of the fixture; and

Figure 5 is a partial view somewhat similar to Figure 3, with additional parts in section, to illustrate how the adjusting screws are assembled with respect to the movable jaws or plates.

Referring specifically to the drawing for a detailed description of the invention, numeral 11 designates generally the body portion of the fixture, which is formed of a relatively flat bottom wall 12 and a flat side wall 13. Obviously, the fixture may be disposed on a bed plate or on a stilt and may rest on either the surface 12 or 13, depending upon the work which is to be done.

A guide rail 14 extends upwardly from the front of the flat surface 12 and an L-shaped guide rail 15 is spaced therefrom and is secured to the main frame 11. A guide rail 16 extends forwardly from wall 13 and is spaced from the guide rail 15. One end of the main body portion is provided with a pair of triangularly shaped horizontal plates 17.

A fixed plate or jaw 18, which extends horizontally across the body portion 11, as viewed in Figure 1, is secured to the plate 17 of the body 11. The jaw 18 is shouldered as shown at 19.

A movable plate or jaw 21 is also horizontally disposed as viewed in Figure 1, and is slidable on the guide rails 15 and 16. It is slidably retained thereon by a plate 22 secured beneath the guide rails 15 and 16 by screws 23. The plate or jaw 21 is shouldered as shown at 20.

A second movable plate or jaw 24 extends vertically across the body portion 11, as viewed in Figure 1, and is shouldered at 25. It is adapted

to slide on the rails 14 and 15, and is slidably secured thereto by means of a plate 31 secured to the jaw 24 by screws (not shown).

A third movable plate or jaw 26 is vertically disposed, as shown in Figure 1, and is shouldered as shown at 27. The plate 26 is adapted to also slide along the rails 14 and 15 and is slidably retained thereon by means of a plate 28 positioned within the body 11 and secured to the jaw or plate 26 by means of screws 29.

A relatively heavy screw threaded member 32 is provided for moving the plate or jaw 21. The threaded member 32 has a knurled knob 33 secured at one end thereof and the other end is rotatably secured to the jaw 21, in a manner hereinafter described. A threaded block 34, through which the threaded member 32 extends, is secured to the body 11 by means of screws 35. Rotation of the knob 33 rotates the threaded member 32 in the threaded block 34 and effects movement of the jaw 21.

A similar threaded member 36 is secured at one end to jaw 26 and has a knurled knob 37 at its opposite end. A similar threaded block 38 is secured to the body 11 by screws 39, and rotation of the knob 37 will obviously move jaw 26.

The same kind of a threaded member 40 is rotatably secured at one end to the movable jaw 24 and has a knurled knob 41 at the other end. It cooperates with a similar threaded block 42 secured to the body 11 by screws 43 to move the jaw 24 when the knob 41 is rotated.

The manner of rotatably attaching the threaded members 32, 36 and 40 to the jaws 21, 24, and 26, respectively, will now be described. Each of the movable jaws is provided with a recess 44, into which one end of the threaded members extends. Each of the threaded members is provided with a flat unthreaded portion 45 at its end. Likewise, each of the threaded members is provided with a reduced portion 46. A recess 48 is provided in each movable jaw and a pin 47 is driven therein and enters the recess 44 at the reduced portion 46 of the threaded members. This construction rotatably secures each of the threaded members in the respective jaws and prevents the threaded members from pulling out of the jaws. It also provides a simple means for assembling the parts.

In Figure 2, I have shown the head 49 of a drill press, which head has secured thereto a drill or bit 50. I have also shown two pieces of material which are to be simultaneously drilled with an aligned hole, and these pieces of material have been given numerals 51 and 52. For the sake of illustration, I have shown the upper piece of material 51 as being of less width than the lower piece 52 and the drilling as off center in the piece 51 and substantially centered in the piece 52.

In using the fixture, one of the pieces of material to be worked on is first secured, preferably, between jaws 18 and 21, and is clamped therein by the jaw 21. After it has been properly positioned and clamped, it need not be again moved. The second piece of material is then positioned where desired between the clamps 24 and 26. Since both of these clamps are movable, obviously, the piece may be positioned at any desired position. If the pieces are to have their edges aligned, it is a simple matter to take a straight edge and align them. After the second piece has been clamped securely between edges 24 and 26, whatever work is desired may be performed.

In the illustration shown in Figure 2, an example of drilling an aligned hole in dissimilar shaped pieces is illustrated.

It is obvious that more than two pieces of material may be worked upon at one time, or that a single irregularly shaped piece of material may be clamped. Several pieces of material may be retained between the jaws 24 and 26 in the example shown in Figure 2. Furthermore, if the piece between one set of the jaws is longer than the jaws, a stilt may be used and the fixture positioned thereon. Obviously, the fixture may rest either on the surface 12 or may be rotated 90° and rest on the surface 13. The position of the fixture will, of course, depend upon the work to be done and the tool to be used.

It is also obvious that this fixture is adapted to properly position and clamp objects of different shapes, such as, for example, spherical shape. Any shaped article may be positioned and clamped in a fixture of this type if the jaws have the correct internal contour.

It is also to be noted that the jaws 18 and 21 are slotted or shouldered along their upper edge, and that the jaws 24 and 26 are slotted or shouldered along their upper and front edges as viewed in Figure 1. This permits the clamping and positioning of thin pieces of material.

From the foregoing, it will be apparent that I have provided an improved vise type fixture which eliminates any clamps, and which properly positions and holds one or two or more pieces of material which are to be worked upon simultaneously.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the disclosed functions and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope without sacrificing any of the advantages thereof.

I claim as my invention:

1. A vise type fixture for positioning and clamping material to be worked upon comprising a body member, a pair of rail means on said body member, said rail means including first and second guide surfaces having respective planes at an angle to each other, a pair of movable jaws cooperable to clamp a work piece, each of said jaws having a non-clamping side surface slidably supported on said first guide surface and extending beyond said second guide surface, a single movable jaw slidably supported on said second guide surface, said single jaw having a non-clamping side surface coplanar with said first guide surface, and a fixed jaw having a non-clamping side surface coplanar with said first guide surface and being cooperable with said single movable jaw to clamp a work piece, whereby the side surface of one of the pair of movable jaws and the side surface of said single movable jaw are slidable in adjacent parallel planes so as to be movable across each other, and the side surface of the other of the pair of movable jaws is slidable in a plane parallel to an adjacent plane containing the side surface of the fixed jaw so as to be movable across the latter surface.

2. A vise type fixture for positioning and clamping material to be worked upon comprising a body member, a pair of rail means on said body member, said rail means including first and second guide surfaces having respective planes

at an angle of ninety degrees to each other, a pair of movable jaws cooperable to clamp a work piece, each of said jaws having a non-clamping side surface slidably supported on said first guide surface and extending beyond said second guide surface, a single movable jaw slidably supported on said second guide surface, said single jaw having a non-clamping side surface coplanar with said first guide surface, and a fixed jaw having a non-clamping side surface coplanar with said first guide surface and being cooperable with said single movable jaw to clamp a work piece, whereby the side surface of one of the pair of movable jaws and the side surface of said single movable jaw are slidable in adjacent parallel planes so as to be movable across each other, and the side surface of the other of the pair of movable jaws is slidable in a plane parallel to an adjacent plane containing the side surface of the fixed jaw so as to be movable across the latter surface.

3. A vise type fixture as set forth in claim 2 wherein threaded members cooperate with the movable jaws to effect movement thereof.

4. A vise type fixture as set forth in claim 2 wherein threaded members cooperate with the movable jaws to effect movement thereof and means are provided for rotatably securing the threaded members in the respective movable jaws.

5. A vise type fixture as set forth in claim 2 wherein guide plates are secured to the movable jaws and cooperate with the rail means to slidably secure the movable jaws thereto.

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