March 9, 1954 A. BEUSCH 2,671,366

COMBINED ANGLE PLATE AND CLAMPING DEVICE

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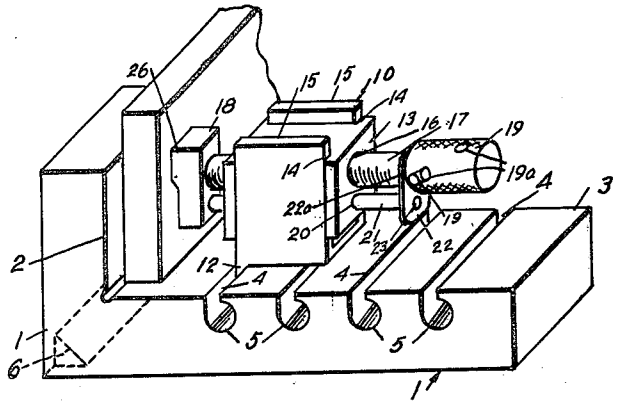

FIG. 1

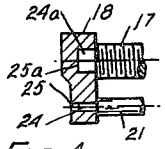

FIG. 4.

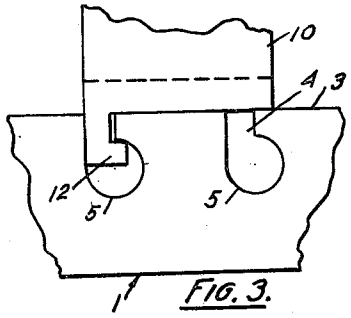

FIG. 3.

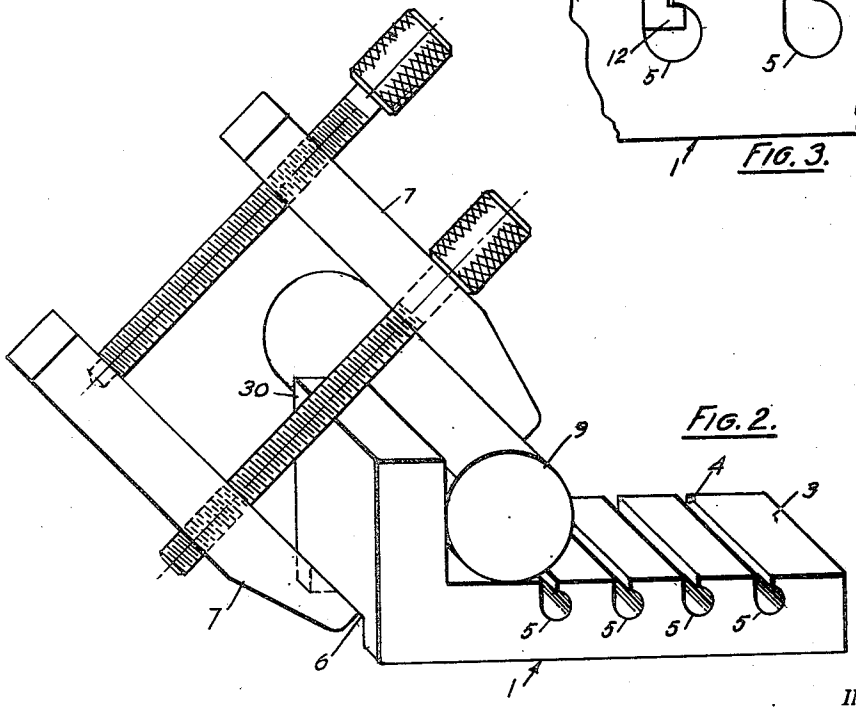

FIG. 2.

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COMBINED ANGLE PLATE AND CLAMPING DEVICE

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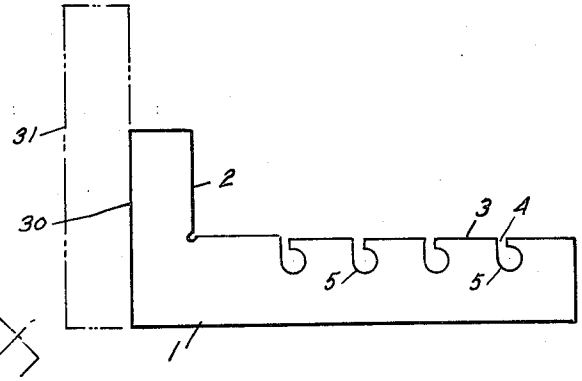

FIG. 5.

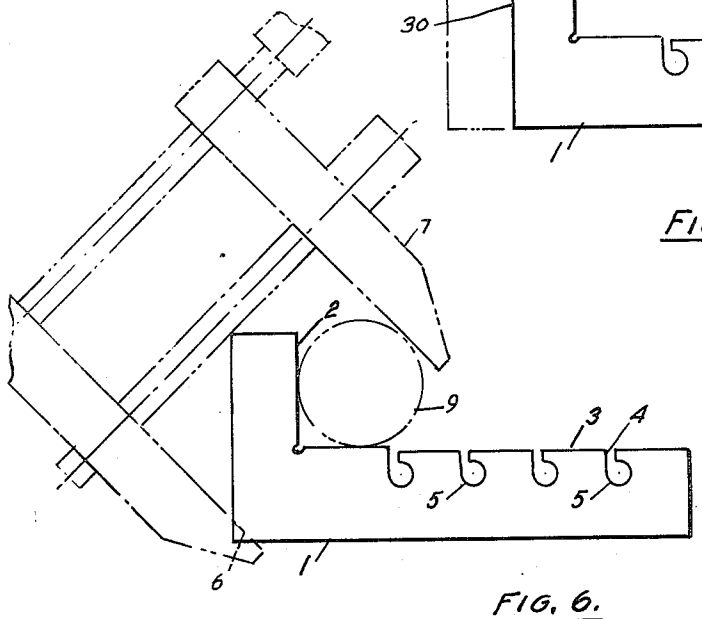

FIG. 6.

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COMBINED ANGLE PLATE AND CLAMPING DEVICE

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11 Claims. (Cl. 81—27)

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This invention relates generally to a combined angle plate and clamping device and more particularly to a combined angle plate and clamping device which has novel means for quickly attaching and detaching a movable jaw.

Base plates and angle plates now on the market are quite expensive inasmuch as T-slots are formed crosswise of the plates which require much time and expense in milling operations. Vises now have a movable jaw with a screw and nut for moving same requiring considerable time to move a jaw to a given position. The capacity of these vises is limited because of the limitation of the opening thereof. It is difficult to square up a workpiece in present vises.

It is, accordingly, an object of my invention to provide a combined angle plate and clamping device for toolroom use which is simple in construction, economical in cost, economical in manufacture, and simple in operation.

Another object of my invention is to provide a combined angle plate and clamping device wherein the slots in the angle plate comprise spaced cross slotted cylindrical apertures in which a depending angle member of a movable jaw slides for fastening same to said angle plate at predetermined distances from the vertical plate thereof.

Another object of my invention is to provide in a clamping device a movable jaw for disposal in a minimum of time at different fixed distances from a fixed jaw.

Another object of my invention is to provide a movable jaw on a combined angle plate and clamping device, the movable jaw being movable longitudinally and vertically.

Another object of my invention is to provide a combined angle plate and clamping device in which two jaws may be utilized.

Another object of my invention is to provide a combined angle plate and clamping device wherein rectangular and round workpieces may be accommodated.

Another object of my invention is to provide a combined angle plate and clamping device which has provisions for attaching a clamp thereto for securing a round workpiece or a comparatively large workpiece externally thereof.

Another object of my invention is to provide a combined angle plate and clamping device so constructed that it may be manufactured in a minimum of time.

Other objects of my invention will become evident from the following detailed description,

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taken in conjunction with the accompanying drawings, in which

Fig. 1 is a perspective view of my novel combined angle plate and clamping device;

Fig. 2 is a perspective view of my novel angle plate with a round piece clamped thereon;

Fig. 3 is an enlarged fragmentary side elevational view of the fastening means for support for my novel movable jaw;

Fig. 4 is a fragmentary sectional view of the clamping jaw and the lead screw and shaft connected thereto;

Fig. 5 is a side elevational view of my novel angle plate with a flat piece in position to be clamped to the outer side thereof; and

Fig. 6 is a side elevational view of my novel angle plate with a round piece clamped therein.

Referring now to the drawings, I show in Figs. 1 to 6 inclusive an angle plate 1 having a vertical face 2 and a horizontal face 3 at right angles to each other. The vertical face 2 forms the fixed jaw of a clamping device as will be hereinafter described. The horizontal face 3 has transverse slots 4 spaced from each other and from the face 2 of the angle plate 1, the slots 4 terminating in cylindrical, transversely extending apertures 5. The slots 4 are cut tangent to the side of the apertures 5 adjacent the vertical face 2. It will be seen that it is a simple machining operation to drill the apertures 5 and then cut a slot 4 from the top face 3. The cost of this operation is many times cheaper than forming a T-slot. The angle plate 1 has a corner thereof cut away at forty-five degrees to form a beveled surface 6 to accommodate a jaw of a parallel jaw clamp 7 to secure a round piece 9 on the angle plate 1 as shown in Fig. 2.

A U-shaped member 10 has an L-shaped depending portion 12 so that it may be secured to the angle plate 1 by merely sliding the depending portion 12 into any of the slots 4 as shown in Figs. 1 and 3 to dispose it in any desired position spaced from the face 2 of the angle plate 1. A vertically slidable H-shaped block 13 has grooves 14 formed on opposite sides thereof so that it slides vertically between opposed legs 15 of the U-shaped member 10. The block 13 has a longitudinally extending, threaded aperture 16 for threadably receiving a lead screw 17 having a jaw 18 mounted on the end thereof adjacent the face 2 of the angle plate 1. A knurled handle 19 is formed on the end of the screw 17 opposite to the jaw 18. The handle 19 has radially extending apertures 19a therein for the insertion of a small bar to rotate the screw 17. The

block 13 also has a longitudinally extending aperture 20 disposed below the threaded aperture 16 and parallel therewith, the aperture 20 slidably guiding a rod 21. A plate 22 is secured to the end of the rod 21 by a screw 23 and it has a bifurcated end 22a nested in a peripheral groove (not shown) on the lead screw 17. The rod 21 and the lead screw 17 have reduced end portions 24 and 24a which extend into parallel recesses 25 and 25a in the jaw 18 whereby the jaw 18 is held in a vertical position. The jaw 18 has a projecting portion 26 on one end thereof to engage a workpiece as shown in Fig. 1. The block 13 may be reversed so that the projecting portion 26 may be on the lower portion of the jaw 18. The block 13 is also movable vertically to various positions.

In the operation of my novel device as an angle plate, the movable jaw supporting member 10 is removed from the angle plate 1. When it is desired to use my novel device as a clamping device to hold a workpiece against the face 2 of the angle plate 1 as in Fig. 1, the depending portion 12 of the member 10 is inserted into the desired slot 4 in accordance with the thickness of the workpiece to be disposed against the face 2 of the angle plate 1. The vertically slidable block 13 is then disposed between the legs of the U-shaped member 10 in the desired vertical position, as shown in Fig. 1, and the handle 19 on the lead screw 17 is rotated until the projecting portion 26 of the jaw 18 engages a workpiece disposed against the face 2 of the angle plate 1. The slidable block 13 may be disposed in any vertical position in the U-shaped member 10 and the U-shaped member 10 may be moved laterally to any desired position before the projecting portion 26 of the jaw 18 engages the workpiece. This is determined in accordance with the shape and height of the workpiece. When the vertical height of the workpiece is relatively small, the slidable block 13 is reversed so that the projecting portion 26 of the jaw 18 is on the lower side thereof. It will be evident that my novel combined angle plate and clamping device may be set up quickly and it will hold a workpiece of maximum size as compared with present vises now on the market. In present conventional vise jaws, there must necessarily be play in the movable jaw which results in the engagement of a workpiece by one side of the movable jaw in many instances, thereby causing uneven clamping. My device always produces square even clamping.

A comparatively large workpiece 31 may be attached to the outer or back face 30 of the angle plate 1 in the position shown in Fig. 5 by the parallel jaw clamp 7 shown in Figs. 2 and 6. The round workpiece 9 may be secured on the angle plate 1 by the parallel jaw clamp 7 as shown in Figs. 2 and 6 with the one jaw of the clamp 7 engaging the round workpiece 9 and the other jaw of the clamp 7 engaging the cut away portion 6 on the lower corner of the angle plate 1. My angle plate is particularly suitable for securing a round workpiece with a clamp 7 so that the end of the round workpiece 9 may be worked upon with the angle plate 1 sitting on its side.

My novel angle plate 1 may accommodate two or more U-shaped members 10 according to the width of the face 3 thereof so that two or more clamping jaws 18 may be provided to hold a workpiece squarely against the vertical face 2 of the angle plate 1.

It will be evident from the foregoing description that I have provided a novel combined angle plate and clamping device particularly useful for close tolerance work, such as for use in a toolshop, whereby it may be used as an angle plate or as a clamping device which may be set up in a minimum of time, which has novel attaching means for a movable jaw of a clamping device, and a combined angle plate and clamping device which is extremely simple in manufacture and economical in cost.

Various changes may be made in the specific embodiment of my invention without departing from the spirit thereof or from the scope of the appended claims.

What I claim is:

1. A combined angle plate and clamping device comprising an angle plate having a horizontally and a vertically extending portion, said horizontal portion having transversely extending, spaced undercut slots, a member having a headed depending portion disposable in any of said slots for securing said member on said horizontal portion of said angle plate, a vertically slidable block in said member, said block having a threaded aperture therethrough, a lead screw threadably engaging the threaded aperture in said block, a handle on said lead screw for rotating same, and a jaw mounted on the end of said lead screw for engaging and securing a workpiece against said vertically extending portion of said angle plate, said transversely extending, undercut slots comprising transversely extending slots extending vertically from the top of said horizontal portion of said angle plate to the side of cylindrical apertures adjacent to the vertically extending portion of said angle plate.

2. A combined angle plate and clamping device comprising an angle plate having a horizontally and a vertically extending portion, said horizontal portion having spaced, longitudinally extending, undercut slots transversely thereof, a member having a heading depending portion disposable in any of said slots for securing said member on said horizontal portion of said angle plate, a vertically slidable block in said member, said block having a threaded aperture therethrough, a lead screw threadably engaging the threaded aperture in said block, a handle on said lead screw for rotating same, and a jaw mounted on the end of said lead screw for engaging and securing a workpiece against said vertically extending portion of said angle plate, said angle plate having a bottom corner thereof cut away at forty-five degrees to receive one jaw of a parallel jaw clamp to clamp a round piece in said angle plate.

3. A combined angle plate and clamping device comprising an angle plate having a horizontally and a vertically extending portion, said horizontal portion having transversely extending, spaced undercut slots, a U-shaped member having a depending portion with an enlarged head for slidable engagement with any of said slots, a block having oppositely disposed grooves slidable in said U-shaped member, said block having a longitudinally extending, threaded aperture, a lead screw threadably engaging the aperture in said block, a handle on said lead screw for rotating same, a jaw disposed on said lead screw for engaging and securing a workpiece against the face of the vertically extending portion of said angle plate, a rod slidable with said block and attached to said jaw, said rod being parallel to and in vertical alignment with said lead screw, and a plate swiveled on said lead screw, one end

of said rod being attached to said plate whereby said jaw is moved in accordance with the movements of said lead screw.

4. A combined angle plate and clamping device as set forth in claim 3 wherein said slots comprise transversely extending, longitudinally spaced cylindrical apertures below the horizontal surface of said angle plate, each having a slot extending vertically from the side of said apertures adjacent said vertically extending portion of said angle plate to the top surface of the horizontal portion of said angle plate, and wherein said enlarged head and said depending portion lie at right angles to one another.

5. A combined angle plate and clamping device comprising an angle plate having a horizontal and a vertical portion, said horizontal portion having longitudinally spaced, transversely extending, cylindrical apertures a predetermined distance below the surface thereof and vertically extending transverse slots terminating in said apertures on the side thereof adjacent said vertical portion of said angle plate, a U-shaped member having a right angled depending portion for slidable engagement with any of the slots in said angle plate, a slidable block having oppositely disposed grooves vertically movable in the U-shaped portion of said U-shaped member, said block having a longitudinally extending threaded aperture therein, a lead screw threadably engaging said aperture, a handle on one end of said lead screw for rotating same, and a jaw on the other end of said lead screw for engaging a workpiece and securing it against the vertical portion of said angle plate.

6. A combined angle plate and clamping device as set forth in claim 5 wherein said jaw has the one end thereof extending outwardly and said block is reversible in said U-shaped member.

7. A combined angle plate and clamping device as set forth in claim 5 wherein said angle plate has a corner thereof cut away at a forty-five degree angle to receive one jaw of a parallel jaw clamp to secure a round piece in said angle plate.

8. A combined angle plate and clamping device as set forth in claim 5 wherein a rod extends through said block parallel to said lead screw, one end of said rod being secured to said jaw and the other end of said rod being secured to said lead screw by a plate.

9. A combined angle plate and clamping device comprising a right angled angle plate having a horizontal and a vertical portion, said horizontal portion having longitudinally spaced, transverse slots terminating in a cylindrical portion in the lower end thereof, a clamping member having a depending portion right angled in shape for slidably engaging any of said slots, a

jaw carried by said clamping member, and means for moving said jaw against a workpiece disposed against the vertical portion of said angle plate.

10. A combined angle plate and clamping device comprising an angle plate having a horizontally and a vertically extending portion, said horizontal portion having transversely extending, spaced undercut slots, a U-shaped member having a depending portion with an enlarged head for slidable engagement with any of said slots, a block having oppositely disposed grooves slidable in said U-shaped member, said block having a longitudinally extending, threaded aperture, a lead screw threadably engaging the aperture in said block, a handle on said lead screw for rotating same, a jaw on said lead screw for engaging and securing a workpiece against the face of the vertically extending portion of said angle plate, said block having a second longitudinally extending aperture parallel to said threaded aperture and a rod extending through said aperture, said rod being attached to said jaw on one end thereof and to said lead screw by a plate on the other end thereof, and said plate being pivotally attached to said lead screw whereby said rod, said plate and said jaw slide as a unit upon rotation of said lead screw.

11. In a clamping device having a horizontally extending portion, said horizontal portion having transversely extending undercut slots, said slots extending vertically from the top of said horizontal portion to the side of cylindrical apertures adjacent the vertically extending portion thereof, and a clamping member for attachment to said horizontal portion, said clamping member comprising a U-shaped body portion and a hook member, said hook member being disposed on the lower surface of said U-shaped member, one edge of said hook member being in alignment with a vertical edge of said U-shaped body.

ANDREW BEUSCH.

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