April 24, 1951 A. WELZ 2,550,629

STRUT MEANS FOR ADJUSTABLE ANGLE VISES

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FIG. 2.

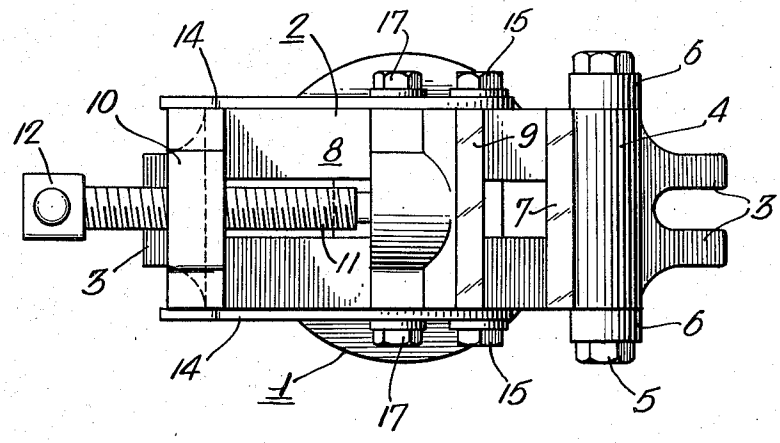


FIG. 3.

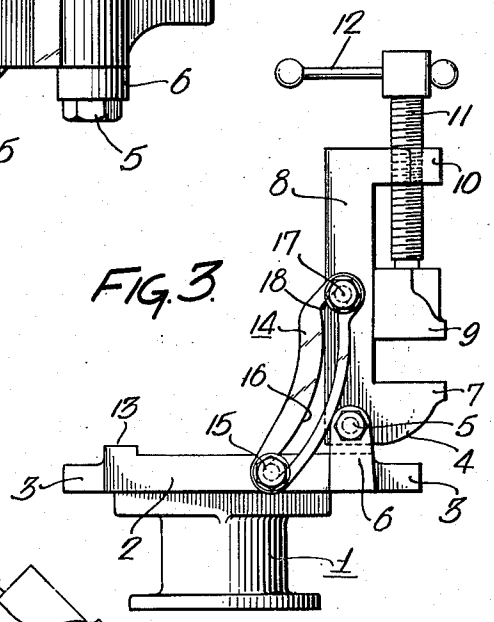
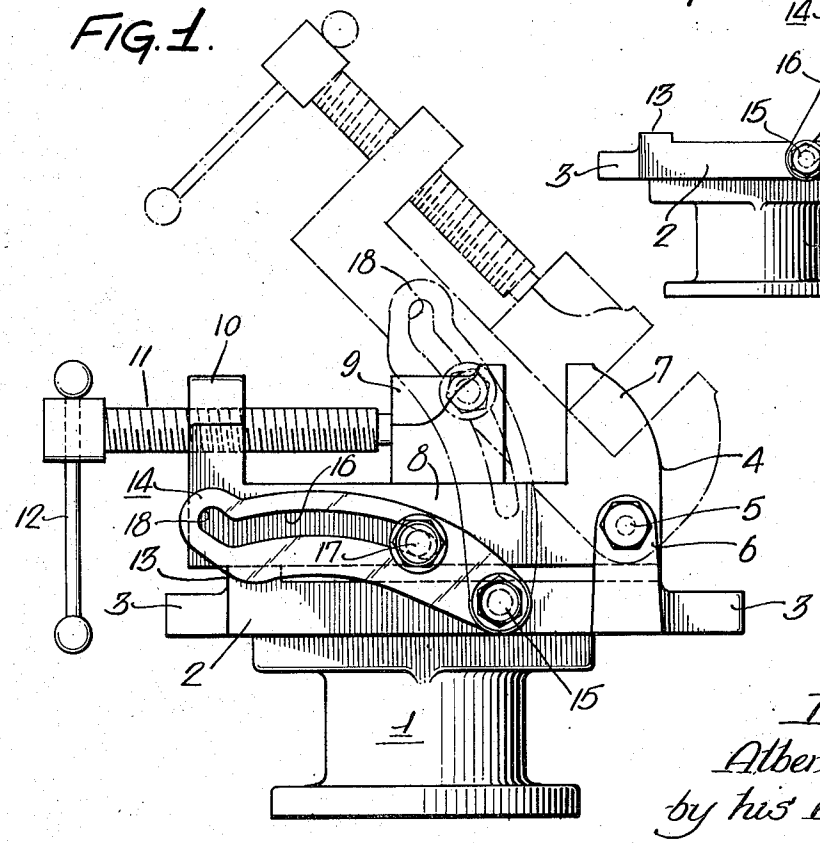


FIG. 1.



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STRUT MEANS FOR ADJUSTABLE ANGLE VISES

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8 Claims. (Cl. 81—41)

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This invention relates to improvements in so-called "angle" vises wherein the relatively fixed element of the jaw assembly is pivotally attached to a base member so as to permit adjustment of the jaw assembly to a plurality of positions about said pivot with respect to said base. Conventionally, the scope of adjustment embraces a pivotal angle of 90 degrees from a normal position of the jaw assembly parallel to the base structure to a position substantially perpendicular to said base.

The present improvement has to do with the character of the strut means which functions to maintain the jaw assembly in the positions of angular adjustment, and a principal object of the invention is to provide a strut device of simple and inexpensive form which may be readily applied to existing vises without material modification of the vise structure as a whole and which will offer no interference or obstruction to the work spaces between the jaws regardless of the angular position of the jaw assembly and regardless of the extent to which the relatively movable element of said assembly may be retracted from the relatively fixed element.

The invention will be more readily understood by reference to the attached drawings, wherein:

Fig. 1 is a side elevational view of a vise made in accordance with the invention, the manner in which the jaw assembly is adjusted and retained in the adjusted position being illustrated in broken lines;

Fig. 2 is a plan view of the vise shown in Fig .1; and

Fig. 3 is a reduced side elevational view showing the jaw assembly in one extreme position of adjustment.

With reference to the drawings, the vise therein illustrated comprises a base 1 which is adapted to be secured to a table or other supporting structure and which therefore constitutes the fixed or base member of the vise structure. In the present instance this base includes a member 2 which, while normally fixed rigidly to the base member 1, may be detached for use in machine tools such, for example, as drill presses, milling machines and the like, said member 2 comprising recessed terminal lugs 3, 3 whereby the member 2 may be attached readily to the bed plates of said machines. This feature of construction forms no part of the present invention and the means for releasably attaching the member 2 to the base member 1 is not shown.

The jaw assembly of the vise consists of a relatively fixed member 4 which is pivotally secured at one end to the member 2, this pivotal connection being effected through the medium of a bolt 5 which is carried in upstanding ears 6, 6 on the member 2 and passes through a journal opening or openings in the member 4. The member 4 includes the relatively fixed jaw element 7 and a

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transverse body member 8 which forms a sliding support for the relatively adjustable jaw 9. At the opposite end of the body member 8 is an upstanding post 10 having a threaded opening for reception of the adjusting screw 11 for the movable jaw 9. The adjusting screw 11 carries at its outer end the conventional handle element 12. The jaw assembly described above is essentially conventional in form and no more detailed description thereof is required for an understanding of the present invention. It is to be noted, however, that normally the body member 8 of the relatively fixed jaw member 4 will be supported in a substantially horizontal position upon the member 2 through the medium of the pivot bolt 5, at one end, and an elevated seat 13 at the other end of the member 2. By reason of the pivotal attachment the entire jaw assembly may be adjusted angularly between the normal horizontal position, in which it is shown in full lines in Fig. 1, through an angle of approximately 90 degrees to a substantially vertical position as shown in full lines in Fig. 3. An intermediate position of the jaw assembly is shown in broken lines in Fig. 1.

In accordance with the present invention a strut element 14 is provided at each side of the member 2 pivotally attached to said member 2 by a screw 15. The struts lie flatly against the opposite side faces of the member 2, as best illustrated in Fig. 2, and are movable angularly about the pivot screws 15 in their respective planes paralleling said side faces. As illustrated, each of the struts is provided with a longitudinal slot 16 which receives a screw 17 threaded into the proximate side of the jaw member 4. If the screws 15 and 17 and the pivot bolt 5 are freed sufficiently to permit movement of the jaw member 4 and the struts 14, the jaw assembly may be adjusted about the pivot bolt 5 to a desired position with respect to the member 2 and may then be secured in the adjusted position by tightening the screws 17 and, if desired, the screws 15.

When the jaw assembly is in the normal position shown in full lines in Fig. 1 the strut elements 14, by reason of their shape, lie entirely below the upper surface of the body member 8 of the jaw member 4, so that irrespective of the position of the adjustable jaw 9 with respect to the jaw 7, the struts will offer no obstruction to the jaw space, i. e., the space between the jaws and the upper surface of the body portion 8 within which the work to be clamped in the vise is received. Also, the slot 16 is curved longitudinally away from said upper surface of the body portion 8, and this curvature is such that throughout the angular traverse of the jaw assembly, the upper edge of the strut, which throughout the major portion of its length from the pivot 15 is curved to conform to the slot curvature, never projects be-

yond the plane of said upper surface in the area between the jaws and thereby offers no obstruction to the jaw space.

At the outer free end of the strut, the slot 16 terminates in an angular offset 18, the function of which is illustrated in Fig. 3. As the jaw assembly approaches the vertical position of adjustment, the edges of the struts 14 approach the near sides of the lugs 6. The offsets 18 of the slots permit the final small angular adjustment of the jaw assembly into the vertical position without interference between the struts and said lugs. Preferably the near edges of the struts will abut the lugs when the terminal position of the assembly is reached, as shown in Fig. 3, so as to reinforce the struts and rigidify the jaw assembly when in this position.

The curved contour of the slot 16 and the terminal offset 18 thereof, and the corresponding contour of the strut, permit location of the pivot 15 relatively close to the lugs 6, so that the struts 14 may, with length adequate for the full 90 degree angular adjustment of the jaw assembly, be contained substantially completely within the length of the jaw member 4. Thus, as shown in Figs. 1 and 2, there is substantially no projection of the free ends of the struts beyond the end of the said jaw member when the said member is in the normal position.

It will be understood that the invention is susceptible to embodiment other than that shown in the drawings and is not confined to vises of the particular form illustrated.

I claim:

1. A vice comprising a base member, a jaw assembly comprising a relatively fixed jaw pivotally secured to the base member and having a lateral extension normally seating on said member, said assembly comprising also a relatively movable jaw slidably mounted on said extension and means for adjusting said movable jaw longitudinally of the extension with respect to the relatively fixed jaw, the upper surface of said extension defining the bottom of the work-receiving space between said jaws; a strut pivotally secured to the base member adjacent the pivot of the relatively fixed jaw and extending away from said pivot at the side of and approximately parallel to said extension and below a plane containing said upper surface of the latter when the extension is normally seated on the base, and means for releasably securing the strut to the extension above the plane of the interseating surfaces of said jaw assembly and base to maintain the assembly in the positions to which it may be adjusted angularly about the jaw pivot, said strut having an effective length permitting said adjustment of the relatively fixed jaw through an angle of not materially less than 90 degrees and being curved over the major part of its length away from the plane of the upper surface of said jaw extension in the area between the jaws so as to clear said plane in every position of adjustment of the jaw assembly within the scope of said angular adjustment and irrespective of the position of the relatively movable jaw on said extension so as to leave said work-receiving space continuously unobstructed.

2. A vise according to claim 1 wherein the free end of the strut terminates approximately at the proximate end of said extension and wherein further the adjusting means for the movable jaw comprises a threaded element extending beyond the extension end.

3. A vise according to claim 1 wherein the angular adjustment of the jaw assembly extends between alternative positions wherein said extension lies substantially parallel and perpendicular to the base respectively, and wherein further an abutment is provided on the base for the strut when the jaw assembly is in the substantially perpendicular position.

4. A vise according to claim 3 wherein the relatively fixed jaw is pivotally supported between upstanding lugs on the base member, and wherein further one of said lugs forms said abutment for the strut when the jaw assembly is in said substantially perpendicular position.

5. A vice according to claim 1 wherein the strut is provided with a longitudinal slot of curved contour for reception of a screw threaded into the side of said extension, which screw when tightened anchors the strut to said extension.

6. A vise according to claim 5 wherein the slot terminates at the free end of the strut in an angular offset permitting a relatively great angular movement of the jaw assembly with respect to the accompanying movement of the strut.

7. A vise according to claim 5 wherein the upper edge of the strut is curved to conform approximately to the curvature of the slot.

8. A vise comprising a base member, a jaw assembly seating on and pivotally attached to said base for adjustment as a whole through an angle of at least approximately 90 degrees from the plane of the interseating surfaces and in a plane normal to the plane of said surfaces, said assembly comprising a pair of relatively movable jaws and a bed member having a surface defining the bottom of the work-receiving space between said jaws, and an adjustable strut for holding the assembly in adjusted position on the base, said strut being pivotally connected to the base at a point adjoining the jaw assembly pivot, and means for releasably securing the strut to the jaw assembly at a point on the bed member above said plane of the interseating surfaces and adjoining a plane containing the work-space-defining surface thereof, said strut over the major part of its length curving away from said last named plane so as to avoid intersecting the plane of said work-space-defining surface in the area between the jaws irrespective of the extent of the jaw opening or the angular position of the jaw assembly on the base.

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