May 25, 1954 E. A. ODIN 2,679,178

MULTIPLE-VISE MOUNTING

Filed Sept. 9, 1948 4 Sheets-Sheet 1

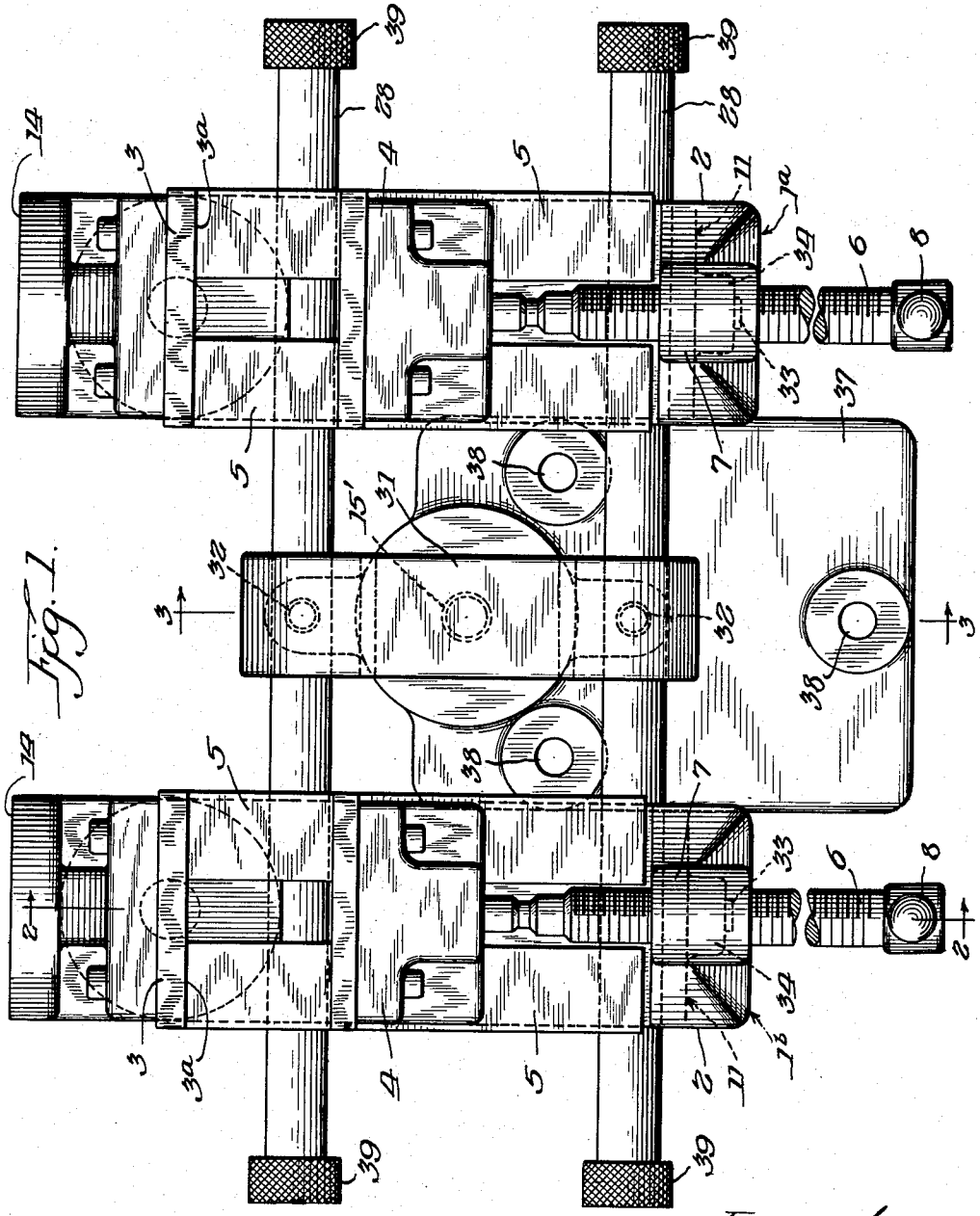


Fig. 1.

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Fig. 2.

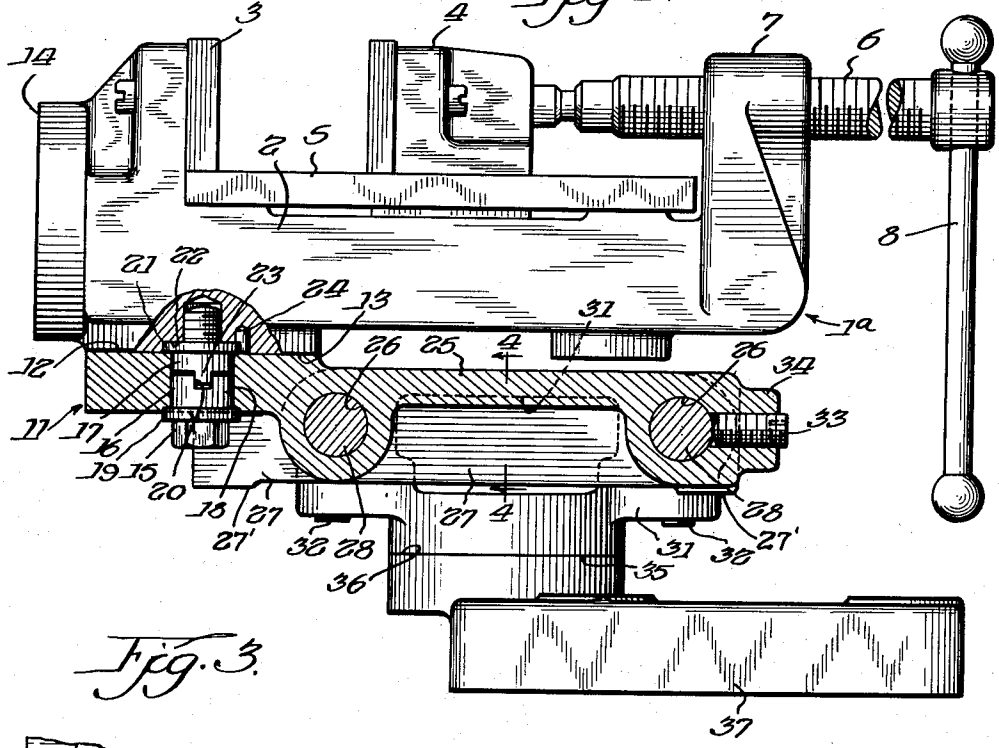


Fig. 3.

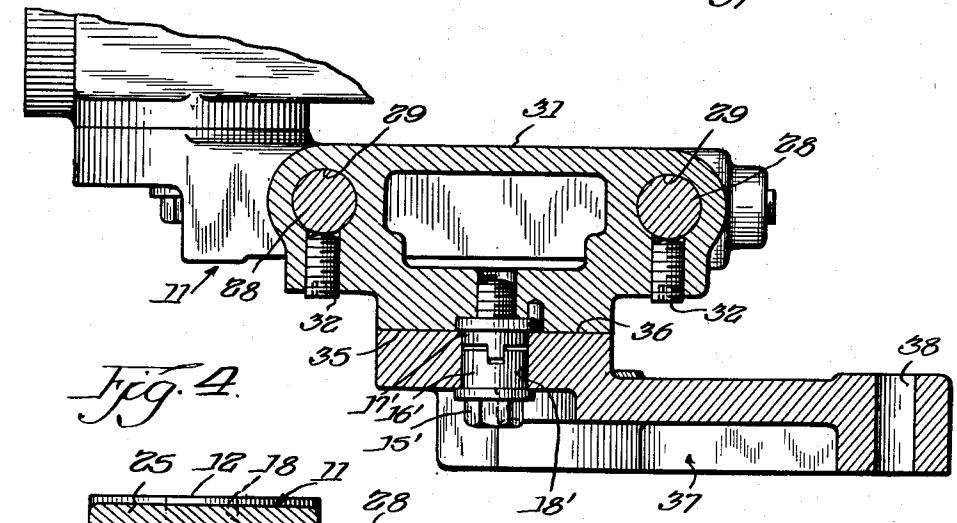
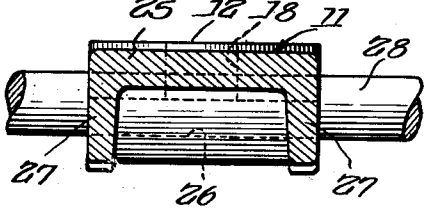


Fig. 4.



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Fig. 5.

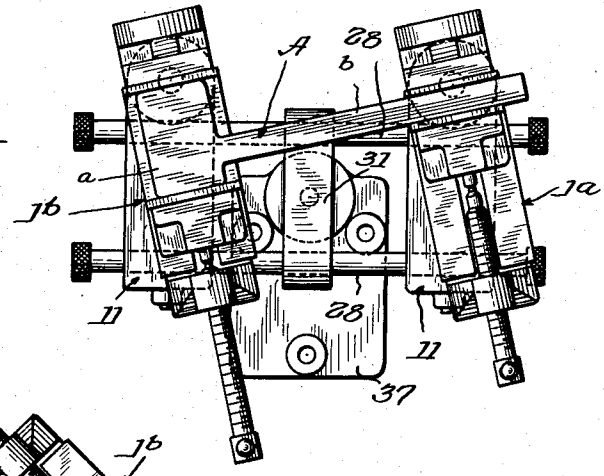


Fig. 6.

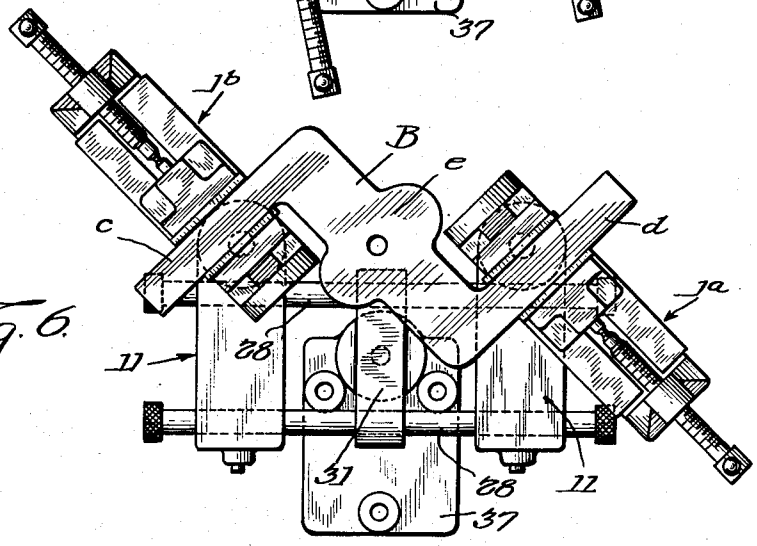
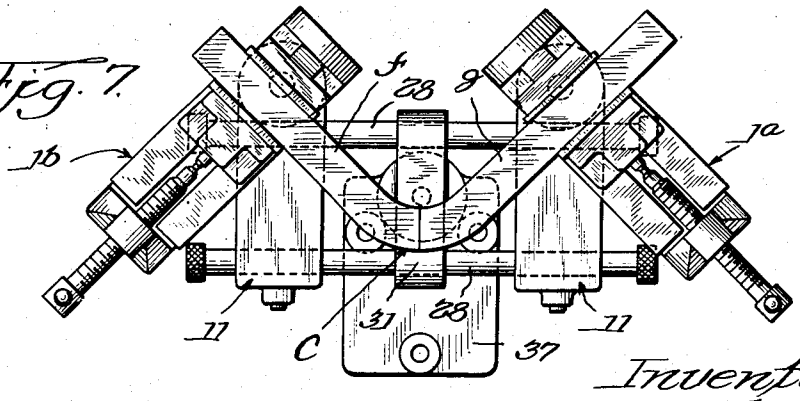


Fig. 7.



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Fig. 8.

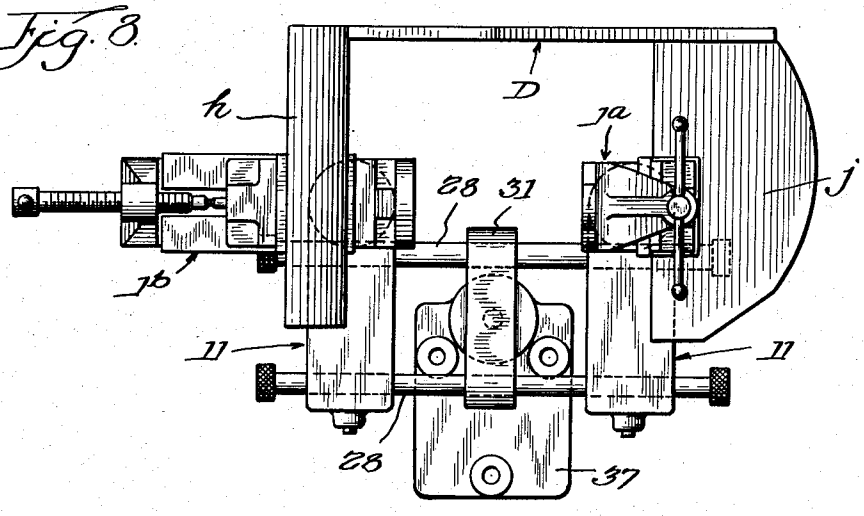
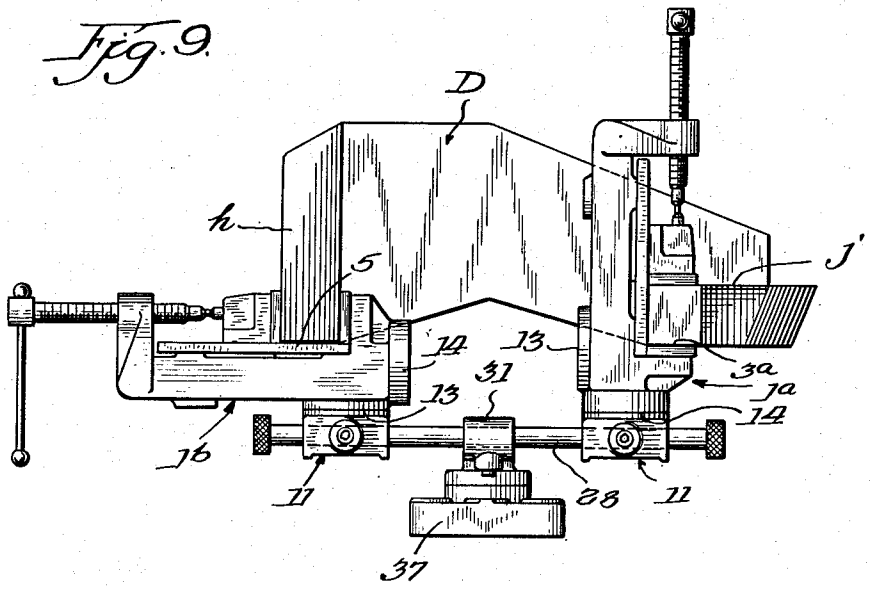


Fig. 9.



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UNITED STATES PATENT OFFICE

2,679,178

MULTIPLE-VISE MOUNTING

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Application September 9, 1948, Serial No. 48,341

12 Claims. (Cl. 81—41)

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The invention relates generally to clamping devices, and more particularly to a mounting structure for a pair of vises or the like.

The invention has among its objects, the production of an improved clamping device wherein a pair of adjustable clamping mechanisms may be adjustably mounted laterally with respect to each other upon a support member and angularly about their respective vertical axes, which are also adapted to be laterally adjusted, and in which the support member is angularly adjustable; and each of the clamping mechanisms is also adapted to be positioned vertically from its normal horizontal position about its vertical axis and angularly adjusted in its vertical position.

Another object of the invention is the production of such a device which is relatively simple in construction, durable, and very efficient for the purposes intended.

A further object of the invention is the production of such a clamping device in which the elements may, when desired, be readily locked in desired relative positions.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a top plan view of a device embodying the present invention;

Fig. 2 is a sectional view of such device taken approximately on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken approximately on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view of one of the vise supporting members taken approximately on the line 4—4 of Fig. 2;

Fig. 5 is a top plan view of the device illustrated in Fig. 1 with a T-shaped object held therein;

Fig. 6 is a view similar to Fig. 5 with a more or less Z-shaped object held therein;

Fig. 7 is a view similar to Fig. 5 with an angle member held in the device;

Fig. 8 is a view similar to Fig. 5 with one of the vises positioned vertically for supporting an irregularly shaped object; and

Fig. 9 is an elevational view of the vises and object illustrated in Fig. 8.

In utilizing vise or clamping mechanisms, it is often times desirable to support the object at more

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than one point, as for example, where the object is of such a shape that it cannot be satisfactorily supported by a single vise. Likewise, it is often times desirable to hold two pieces in particular relative positions, as for example where two pieces are to be secured together. By the use of the present invention such operations may be readily performed.

Referring to the drawings and particularly to Figs. 1 through 4, the embodiment of the invention illustrated comprises a pair of vises or clamping devices indicated generally by the numerals 1a and 1b which, for the purposes of illustration, are substantially identical as to details of construction with the vise structures illustrated in my co-pending applications Serial No. 689,090 and Serial No. 689,091, filed August 8, 1946, both now abandoned. Briefly, each vise comprises a bed 2 having a stationary jaw 3 and a movable jaw 4 movable into clamping relation with the jaw 3 by a screw 6 threaded into the standard 7 carried by the bed 2, with the free end of the screw 6 terminating in a handle 8. The vises 1a and 1b are mounted on respective supporting members indicated generally by the numeral 11, each having a mounting seat 12 thereon cooperable with either the mounting seat 13 or the mounting seat 14 of the respective vises, each vise and its respective supporting member being secured in operative position by a bolt 15 passing through sleeves 16 and 17 positioned in a bore 18 in the supporting member with the bolt 15 threaded into the bed 2 of the vise. The sleeves 16 and 17 are similar to those illustrated in my co-pending application Serial No. 689,091, now abandoned, the sleeve 16 having an annular flange 19 adjacent the head of the bolt 15, which flange bears upon the adjacent face of the supporting member 11 with the inner end of the sleeve 16 having a pair of diametrically opposed notches 20 therein (only one of which is illustrated in Fig. 2). Similarly, the sleeve 17 is provided with an annular flange 21 seated in a complementary recess 22 in the mounting seat 13 of the vise, and the opposite end of the sleeve is provided with a pair of diametrically opposed projections 23 (only one of which is illustrated in Fig. 2), which are positioned in the notches 20 in the sleeve 16. Relative rotation between the sleeve 17 and vise bed is prevented by a pin 24 secured to the bed 2 and which extends into an arcuate notch in the flange 21. It will be noted that with this construction, the sleeves 16 and 17 are rigidly connected to the vise bed 2, insofar as relative rotation therebetween is

concerned, and when the bolt 15 is tightened down, the supporting member 11 will be securely clamped between the annular flanges 19 and 21 of the respective sleeves and the mounting seats 12 and 13 will be firmly drawn together. However, by slightly loosening the respective bolts 15 either of the vise structures 1a and 1b may be rotated relative to their respective supporting members about the axis of the respective bolt 15 and sleeves 16 and 17, and as the sleeve 16 will rotate with the vise bed there is no tendency for the bolt 15 to loosen as the vise is pivoted relative to its supporting member. The mounting seat 14 is constructed in the same manner as the mounting seat 12 so that by unscrewing the bolt 15 from the bed the vise may be mounted in a vertical position, with the mounting seat 14 located on the mounting seat 12 of the supporting member. The distance between the clamping face 3a of the jaw 3 to the face of the mounting seat 14 is equal to the distance between the top surfaces of the ways 5 and the face of the mounting seat 13.

Each of the supporting members 11 is provided with a laterally extending body portion 25 having a pair of spaced parallel bores 26 therein extending at right angles to the bore 18, with the portions of the body portion 25 intermediate the bores 26 being hollow to form downwardly depending side walls 27, so that each supporting member 11 is generally rectangular in shape with the mounting seat 12 located at one end thereof. Extending through the bores 26 to the respective supporting members 11 are a pair of rods 28 which also extend through bores 29 in an intermediate member 31 positioned between the two supporting members 11, as clearly illustrated in Fig. 1. The member 31 is provided with a pair of set screws 32 threaded therein adapted to engage the respective rods 29, whereby the latter may be rigidly locked in position relative to the member 31, and similarly, each of the members 11 is provided with a set screw 33 threaded into a boss 34 located at the end thereof opposite to that carrying the mounting seat 12, the set screws 33 each engageable with the rod 28 adjacent thereto, whereby the respective members may be rigidly secured to such rod when desired. The member 31 is provided with a mounting seat 35 engageable with a cooperative mounting seat 36 carried by a generally rectangularly shaped base member indicated generally by the numeral 37 which is provided with mounting holes 38 therein for securing the base member to a suitable supporting surface. The intermediate member 31 and base 37 are pivotally connected to one another by a bolt 15' and sleeves 16' and 17' positioned in the bore 18' of the base 37 and constructed in the same manner as the sleeves 16 and 17. Thus, the member 31 may be rotated relative to the base 37 and locked in any desired position. The ends of the rods 28 are each provided with a cap 39, secured thereto by any suitable means, as for example, threaded onto the ends of the rods and serve to retain the members 11 and 31 on the rods.

It will be apparent from the above description that the vise mechanisms 1a and 1b may be individually rotated about their respective supporting members, and that by partially backing out the set screws 32 and 33 the supporting members 11 and respective vise mechanisms, as well as the rods 28, may be laterally moved relative to the intermediate member 31 and thus, the two vise mechanisms may be moved towards or away from one another in a plane passing through the axes of the respective rods 28. Likewise, if desired, either or both of the supporting members 11 may be locked in position relative to the member 31 or to each other by turning down the set screws 32 or 33. The members 11 are each formed with pads 27' extending downwardly from the wall 27, the bottom surfaces of the pads lying in a common plane extending parallel to the seats 12 so that if desired, the member 31 may be removed from the rods 28 by unscrewing caps 39 therefrom, whereby the members 11 may be supported by the pads 27' on a flat supporting surface such as the bed of a machine.

It will be noted that with this construction a definite relationship exists between the relative movements of the the two vise mechanisms 1a and 1b, so that the latter may cooperate with one another to achieve the desired results.

Examples of typical applications of the present invention are illustrated in Figs. 5, 6, 7, 8 and 9.

Fig. 5 illustrates the manner in which an irregularly shaped object may be rigidly held in position by the cooperative action of the two vise mechanisms, the article A having a rectangularly shaped head portion *a* and an elongated shank portion *b* extending therefrom and laterally offset with respect to the head *a*. Assuming that the connections between the respective vises and their supporting members is such as to just permit relative movement of the vise mechanisms with their respective supporting members and that at least one of the supporting members 11 is free to move along the rods 28, it is merely necessary to lock one portion of the article in one of the vises, as for example, the head *a* in the vise mechanism 1b with the shank *b* positioned in the open jaws of the vise mechanism 1a and then close the jaws of the vise 1a, clamping the shank *b* in said jaws. During this operation the two vise mechanisms will pivot about their connections with their respective supporting members 11 and if necessary, the two supporting members will move towards or away from each other as required until the shank *b* is rigidly clamped between the jaws of the vise mechanism 1a. If desired, the supporting members 11 may then be rigidly locked on the one rod 28 and one or both of the rods 28 locked to the intermediate member 31. Under average operating conditions, the rods 28 may be maintained in a locked position on the intermediate member 31 and one of the supporting members 11 locked to the one rod 28, leaving the other supporting member 11 free to slide along the rods 28.

Fig. 6 illustrates the use of the present invention in holding a more or less Z-shaped article B having oppositely disposed offset flanges *c* and *d* and the operations, for example, to be performed on the article B are to take place in the central cross member *e*, which is of a shape that it cannot be satisfactorily held in a single vise of the usual construction, and it will be apparent that if the article was supported merely by one of the flanges *c* or *d*, it may be inadequately supported for the operations to be performed thereon.

Fig. 7 illustrates the use of the present invention in supporting two halves *f* and *g* of an angle structure indicated generally by the letter C, the two halves being securely held in a definite predetermined relationship. Obviously, when so used, the supporting members and vise structures

will normally be locked in the desired relative positions.

Figs. 8 and 9 illustrate the use of the present invention to support an irregularly shaped object, indicated generally by the letter D having laterally extending portions *h* and *j*, wherein the vise *1a* is mounted in a vertical position, and it will be noted that the clamping face *3a* of the vise *1a* lies in the same plane as the upper faces of the ways **5** of the vise *1b*. It will be noted that the shape of the portions *h* and *j* of the object D are such that it could not be suitably held in the desired position by means of a single vise, nor could it be satisfactorily held in the vise *1a* if the latter were in a horizontal position. It will also be noted that the bottom surfaces of the portions *h* and *j* lie in a common plane and rest respectively on the ways **5** of the vise *1b* and face *3a* of the vise *1a*. In some applications of the present invention, it may be desirable to have both vises in a vertical position.

The examples disclosed in Figs. 5 to 9 inclusive, of applications of the present invention to different articles are merely illustrative, and it will be apparent from the disclosure herein given that the present invention has many other applications, wherein the two vise mechanisms are cooperable with one another to produce results not obtainable from previous devices.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the scope of my invention; hence, I do not wish to be understood as limiting myself to the exact form, construction, arrangement, and combination of parts herein shown and described or uses mentioned.

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

1. In a clamping device, the combination including a pair of clamping structures, a supporting member for each of said structures, means for rigidly supporting each clamping structure on the respective supporting member thereof in any one of a plurality of positions about a fixed axis, an intermediate supporting member for mounting the clamping device, a pair of spaced-apart parallel rods mounted on said intermediate supporting member for axial adjustment, means for securing said rods in their adjusted position, and each of said first mentioned supporting members having a pair of parallel bores extending therethrough for slidably supporting the same on said parallel rods.

2. In a clamping device, the combination including a pair of clamping structures, a supporting member for each of said clamping structures, means for rigidly supporting each clamping structure on the respective supporting member thereof in any one of a plurality of angular positions about a fixed axis, and a pair of spaced-apart parallel rods, each of said supporting members having a pair of parallel bores extending therethrough for slidably supporting the same on said parallel bars, and means for rigidly holding said parallel bars in spaced-apart relation and securing the same to a supporting structure.

3. The combination set forth in claim 2 further characterized by means on each of said supporting members co-operating with at least one of said parallel bars for locking the member in any desired set position along the length of said parallel bars.

4. The combination set forth in claim 2 wherein said parallel bar holding and securing means comprises an intermediate member positioned between said supporting members, said intermediate member having a pair of bores extending therethrough for slidably supporting said parallel bars, a base member for said intermediate member, said base member being securable to a supporting surface, and means for rigidly supporting said intermediate member on said base member in any one of a plurality of angular positions about a fixed axis.

5. The combination set forth in claim 2 further characterized by means on each of said supporting members co-operating with at least one of said parallel bars for locking each supporting member in any desired set position along the length of said parallel bars, and wherein said parallel bar holding and securing means comprises an intermediate member positioned between said supporting members, said intermediate member having a pair of bores extending therethrough for slidably supporting said parallel bars, a base member for said intermediate member, said base member being securable to a supporting surface, means for rigidly supporting said intermediate member on said base member in any one of a plurality of angular positions about a fixed axis, and means on said intermediate member co-operating with at least one of said parallel bars for locking the intermediate member in any desired set position along the length of said parallel bars.

6. In a clamping device, the combination including a pair of vise mechanisms, each including a vise bed and co-operating stationary and movable jaws, a pair of vise supporting members each having a mounting seat thereon, each of said vise beds having a pair of like mounting seats disposed at right angles to one another for removably mounting the same to turn on the mounting seat of the respective mounting member thereof for adjustment about an axis extending either lengthwise or transversely with respect to such bed, means for rigidly locking a desired one of the mounting seats of each of said vise beds to the respective supporting member thereof with the vise mechanism set in any one of a plurality of angular positions about a fixed axis, a pair of spaced-apart parallel rods, each of said vise supporting members having a pair of parallel bores extending therethrough for slidably supporting said parallel bars, and means for rigidly holding said parallel bars in spaced-apart relation and securing the same to a supporting structure.

7. In a vise mounting, the combination of a pair of vise supporting members each having a mounting seat thereon, a third member having means for supporting said supporting members for movement towards or away from one another, and a pair of vise mechanisms each including a vise bed and cooperating stationary and movable jaws, each vise bed having a pair of like mounting seats disposed at right angles to one another for removably mounting the same to turn on the mounting seat of its respective supporting member for adjustment about an axis extending either lengthwise or transversely with respect to such bed, said last mentioned axes extending parallel to one another, and one of said mounting seats lying in a plane extending parallel to the work engaging face of said stationary jaw, and the other mounting seat lying in a plane extending parallel to the work engaging face of said bed, said mounting seats of each vise mechanism being

equidistant from their respective stationary jaw and bed work engaging faces.

8. In a vise mounting, the combination of a base member, a pair of vise supporting members each having a mounting seat thereon, an intermediate member pivotally supported by said base member and rotatable relative thereto about a transverse axis, a pair of spaced parallel rods carried by said intermediate member, upon which said vise supporting members are slidably mounted, said rods lying in a plane transverse to said axis, and a pair of vise mechanisms each including a vise bed and cooperating stationary and movable jaws, each vise bed having a pair of like mounting seats disposed at right angles to one another for removably mounting the same to turn on the mounting seat of its respective supporting member for adjustment about an axis extending either lengthwise or transversely with respect to such bed, said last mentioned axes extending parallel to one another and to said transverse axis, one of said mounting seats lying in a plane extending parallel to the work engaging face of said stationary jaw, and the other mounting seat lying in a plane extending parallel to the work engaging face of said bed, and means for rigidly locking each vise bed to its respective supporting member independently of the connection of the latter to said rods.

9. In a vise mounting, the combination of a pair of vise supporting members each having a mounting seat thereon, a pair of vise mechanisms each including a vise bed and cooperating stationary and movable jaws, each vise bed having a pair of like mounting seats disposed at right angles to one another for removably mounting the same to turn on the mounting seat of its respective supporting member for adjustment about an axis extending either lengthwise or transversely with respect to such bed, means for rigidly locking each vise bed to its respective supporting member in any position of adjustment, one of said mounting seats lying in a plane extending parallel to the work engaging face of said stationary jaw, and the other mounting seat lying in a plane extending parallel to the work engaging face of said bed, and means connecting said vise supporting members for movement towards or away from one another in a plane extending transversely to said axes, while said vise beds are rigidly mounted thereon, and for maintaining the vise supporting members in parallel relation.

10. In a vise mounting, the combination of a base member, a pair of vise supporting members each having a mounting seat thereon, an intermediate member pivotally supported by said base member and rotatable relative thereto about a transverse axis, said intermediate member having means for supporting said vise supporting members for movement towards or away from one another in a plane extending at right angles to said axis, and a pair of vise mechanisms each including a vise bed and cooperating stationary and movable jaws, each vise bed having a pair of like mounting seats disposed at right angles to one another for removably mounting the same to turn on the mounting seat of its respective supporting member for adjustment about an axis extending either lengthwise or transversely with respect to such bed, said last mentioned axes extending parallel to one another and to said transverse axis, one of said mounting seats lying in a plane extending parallel to the work engaging face of said stationary jaw, and the other mounting seat lying in a plane extending parallel to the work engaging face of said bed and means for rigidly locking each vise bed to its respective supporting member independently of the connection of the latter to said intermediate member.

11. In a vise mounting, the combination of a pair of cooperable vise mechanisms each including a bed, a stationary jaw adjacent one end of said bed, a movable jaw operatively related to said stationary jaw, and a pair of like mounting seats, one of said mounting seats lying in a plane extending parallel to the work engaging face of said stationary jaw, and the other mounting seat lying in a plane extending parallel to the work engaging face of said bed, said mounting seats of each vise mechanism being equidistant from their respective stationary jaw and bed work engaging faces, and means for supporting said vises in cooperable relation, said means including a mounting seat for each vise mechanism engageable with either of the mounting seats of the respective vise mechanisms.

12. In a vise mounting, the combination of a pair of cooperable vise mechanisms each including a bed, a stationary jaw adjacent one end of said bed, a movable jaw operatively related to said stationary jaw, and a pair of like mounting seats, one of said mounting seats lying in a plane extending parallel to the work engaging face of said stationary jaw, and the other mounting seat lying in a plane extending parallel to the work engaging face of said bed, said mounting seats of each vise mechanism being equidistant from said stationary jaw and bed work engaging faces, a base member, a vise supporting member for each vise mechanism, having a mounting seat thereon, an intermediate member pivotally supported by said base member and rotatable relative thereto about a transverse axis, said intermedeiate member having means for supporting said vise supporting members for movement towards or away from one another while the mounting seats thereon remain coplanar, said last mentioned mounting seats each being cooperable with either of the mounting seats on the respective vise mechanisms for supporting the latter in any of their adjusted positions.

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