Feb. 14, 1956 R. H. SCHUM ET AL 2,734,409

BAR-STOCK VISE

Filed May 2. 1952 2 Sheets-Sheet 1

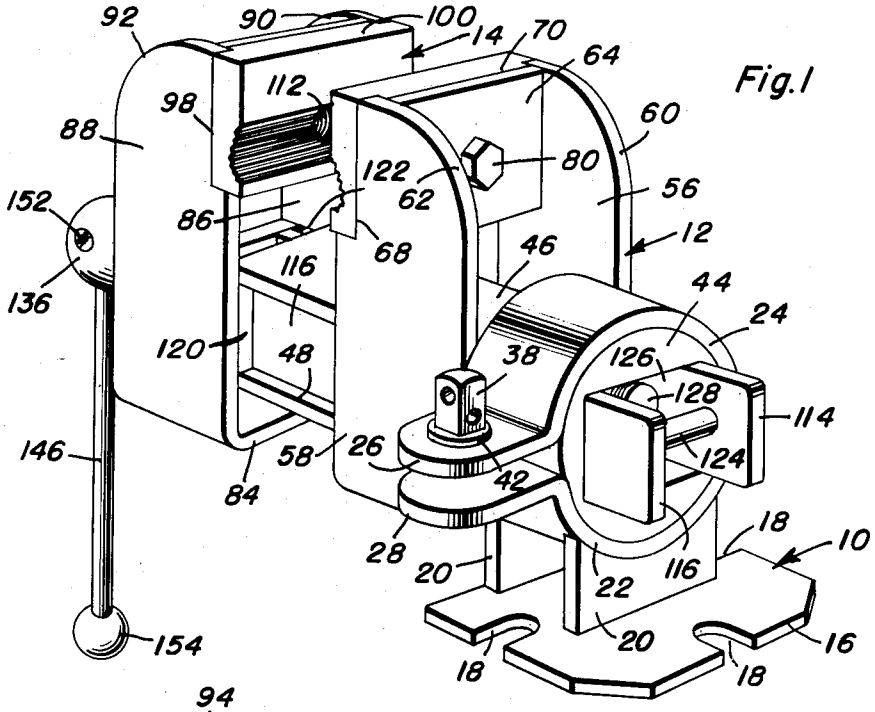

Fig. 1

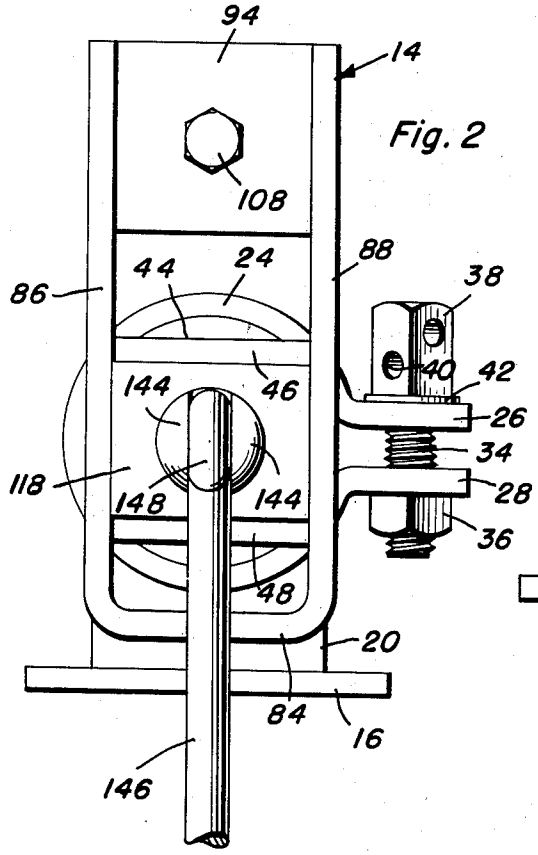

Fig. 2

Fig. 5

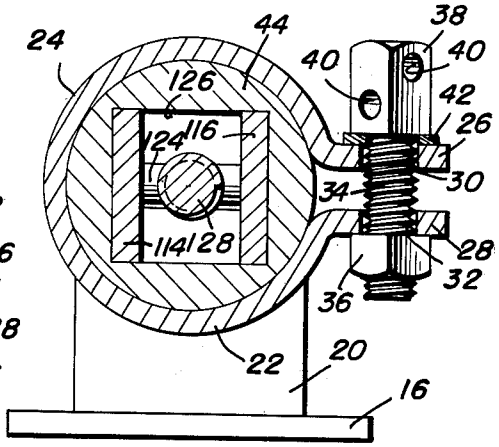

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Fig. 3

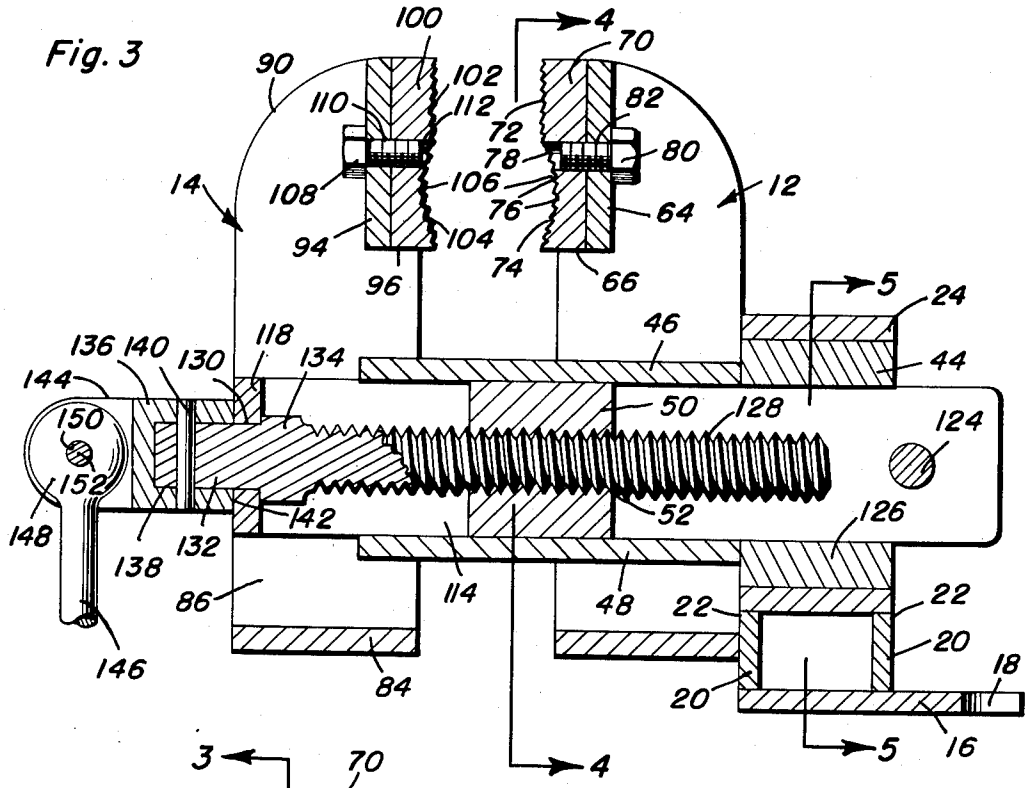


Fig. 4

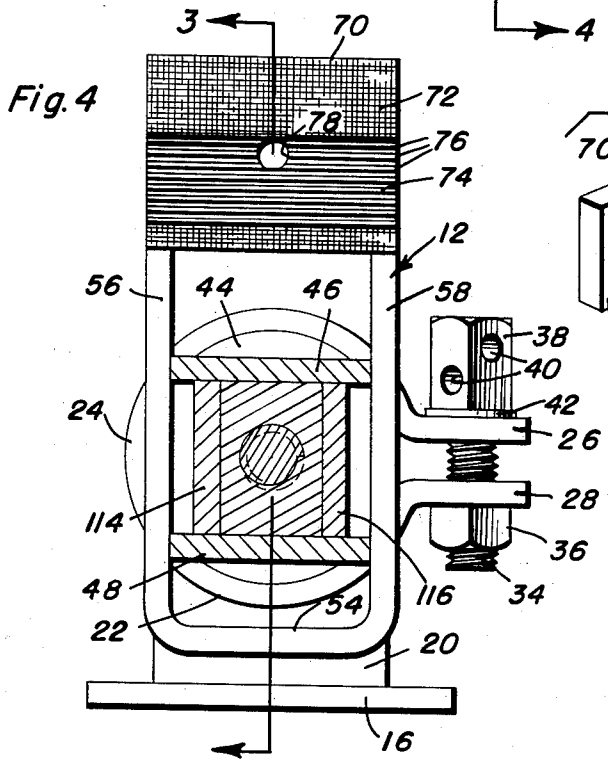
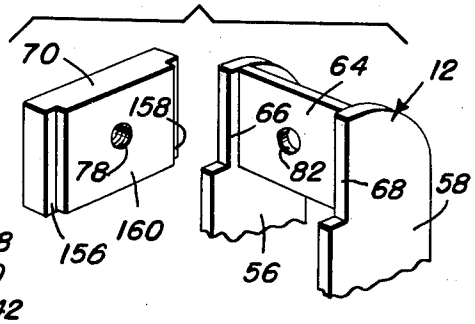


Fig. 6



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BAR-STOCK VISE

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Application May 2, 1952, Serial No. 285,632

4 Claims. (Cl. 81—33)

This invention relates to improvements in vises for general use and adapted to clamp both flat and rounded objects.

The primary object of this invention is to provide an improved vise which is formed of all-steel members welded together to provide a rigid non-breakable vise structure.

Another object of this invention is to provide an improved clamping member for a vise which is formed out of flat bar stock and then welded together so as to resist breaking during use.

Another object of this invention is to provide an improved vise structure which is formed of conventional steel stock bent and welded in such a manner that the vise becomes economically feasible to produce.

A further object of this invention is to provide an improved vise having a slide structure which is generally box-shaped and formed of steel bars whereby close tolerance is maintained.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be hereinafter described in detail in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which form a material part of this specification, and in which:

Figure 1 is a perspective view of the improved vise which is the subject of this invention, looking at the device from the rear, the clamping members of the vise being separated so that jaws associated therewith assume work-receiving positions;

Figure 2 is an enlarged front elevational view of the vise of Figure 1;

Figure 3 is an enlarged longitudinal vertical sectional view, taken substantially upon the plane indicated by the section line 3—3 of Figure 4 and showing the general construction of the various elements thereof and the relationship of the clamp members and their associated slide members, the clamping handle for the vise having its lower end broken away;

Figure 4 is a transverse vertical sectional view, taken substantially upon the plane indicated by the section line 4—4 of Figure 3 and showing the general relationship of the slide members;

Figure 5 is a transverse vertical sectional view, taken substantially upon the plane indicated by the section line 5—5 of Figure 3 and showing the relationship of the rear end of one of the slides with respect to a support for the vise; and,

Figure 6 is an enlarged fragmentary perspective exploded view of the upper end of one of the clamp members and shows the arrangement of a jaw adapted to be connected thereto.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the different views of the drawings.

Referring now to the accompanying drawings in detail, it will be seen that there is illustrated in Figure 1 the improved vise, which is the subject of this invention, and

which includes a support referred to in general by the reference numeral 10, a relatively fixed clamp member 12 mounted on the support for rotation about a horizontal axis, and a slidable clamp member 14 associated with the fixed clamp member 12.

The support 10 includes a base plate 16 formed of a flat plate of steel which is generally rectangular in outline and is provided with slots 18 in its edges for receiving fasteners in order to clamp same to a supporting structure (not shown). Extending upwardly from the base 16 are a pair of spaced parallel supporting plates 20 which have curved aligned seats 22 in the upper sides thereof. Disposed within the seats 22 and welded to the supporting plates 20 is a split ring clamping member 24 having a pair of horizontal extending spaced parallel flanges 26 and 28. The flanges 26 and 28 have aligned bores 30 and 32, respectively, receiving a clamping bolt 34 therethrough. The flange 28 has secured to its outer face by welding, a nut 36 in which the bolt 34 is threadedly engaged. The upper end of the bolt 34 is provided with a square head 38 having transverse bores 40 therethrough for receiving a rotating bar (not shown). Disposed between the head 38 and the flange 26 is a washer 42.

Referring now to Figures 3 and 5 in particular, it will be seen that there is rotatably mounted within the split ring 24 a cylindrical supporting element 44 connecting the supporting portion of the vise with the clamping portion thereof. Welded to the front face of the supporting element 44 and extending forwardly therefrom is a pair of spaced parallel flat bars 46 and 48, the flat bars normally lying in horizontal planes. Extending between the flat bars 46 and 48 adjacent the forward ends thereof is a vertically extending spindle nut 50 having a threaded bore 52 therethrough. The supporting element 44, the horizontal bars 46 and 48, and the spindle nut 50 form a rigid box structure and compose the guide member for the movable clamp 14, and a mount for the fixed clamp 12.

Referring now to Figures 3 and 4 in particular, it will be seen that the clamp member 12 is generally U-shaped in section and includes a base 54 and a pair of upstanding legs 56 and 58. The upstanding legs 56 and 58 are in spaced parallel relation and have their upper rear portions curved as at 60 and 62, respectively. The upper ends of the upstanding legs 56 and 58 are connected together by a vertical transverse element 64 formed of flat bar stock and welded to the inner surfaces of the upstanding legs 56 and 58 rearwardly of their forward edges. The upper forward edges of the upstanding legs 56 and 58 are notched as at 66 and 68, respectively, to form a seat for a jaw member 70.

The jaw member 70 is in the form of a generally rectangular tempered block provided with a roughened object-engaging-face 72. The face 72 is also provided with an arcuate recess 74 having parallel transversely extending teeth 76 for engaging and gripping a pipe or other rounded object. The jaw member 70 is provided with a threaded bore 78 receiving one end of a bolt 80 which passes through a bore 82 in the transverse element 64, the bolt 80 clamping the jaw member 70 to the transverse element 64.

The horizontal bars 46 and 48 are of a width equal to the spacing between the upright legs 56 and 58 of the clamp member 12 and are secured therebetween by welding. It will be noted that the base 54 of the clamp member 12 is disposed below and in spaced relation to the lowermost horizontal bar 48, and that the rear edges of the upright legs 56 and 58 of the clamp member 12 are positioned closely adjacent the front face of the circular supporting element 44.

Referring now to Figures 1 and 2 in particular, it will be seen that the clamp member 14 is identical in shape to the clamp member 12 and includes a horizontal base 84

having integral therewith upstanding legs 86 and 88. The upper front edges of the upstanding legs 86 and 88 are rounded at 90 and 92 to give a smooth upper contour and a pleasing appearance. Extending between the upper ends of the upright legs 86 and 88 is a vertical transverse element 94 which is welded to the inner surfaces of the legs 86 and 88. The upper rear portions of the upright legs 86 and 88 are recessed, as at 96 and 98, respectively, to provide seats for a transversely extending jaw member 100, the jaw member 100 being identical in shape to the jaw member 70.

The jaw member 100 is also provided with a roughened face 102 which is recessed in the lower portion thereof to form an arcuate surface 104 which is provided with longitudinally extending teeth 106. The jaw member 100 is secured to the clamp member 14 by a bolt 108 passing through a bore 110 in the transverse element 94 and being threadedly engaged in a threaded bore 112 in the jaw member 100.

Forming a slide construction for the clamp member 14 is a pair of spaced parallel longitudinally extending bars 114 and 116 which are formed of flat bar stock and normally lie in spaced parallel vertical planes. The vertical bars 114 and 116 are secured together at their forward ends by a transversely extending bar 118 which abuts the forward ends of the vertical bars 114 and 116 and is welded thereto. The width of the transverse bar 118 is equal to the space between the upright legs 86 and 88 and is secured to the inner surfaces thereof and flush with their forward edges. The vertical bars 114 and 116 are offset inwardly from the outer edges of the transverse bar 118 and do not directly contact the upright legs 86 and 88 of the clamp member 14. However, spacer plates 120 and 122 are disposed between the upright leg 88 and the vertical bar 116, and the upright leg 86 and the vertical bar 114, respectively, and welded thereto.

In order that the vertical bars 114 and 116 may be secured together to form a rigid box, they are connected adjacent their rear ends by a transverse rod 124 secured to their inner sides. The supporting element 44 is provided with a centrally located rectangular opening 126 therethrough, through which pass the vertical bars 114 and 116 and the end portion of a threaded spindle 128.

Referring now to Figure 3 in particular, it will be seen that the transverse bar 118 is provided with a centrally located bore 130 therethrough in which is received a forward end 132 of the threaded spindle 128. The spindle 128 is provided with a shoulder 134 engaging the inner face of the transverse bar 118 and preventing the forward movement of the spindle 128 with respect thereto. In order that the spindle 128 may be conveniently rotated, it is provided with a head 136 having a bore 138 receiving the forward end 132. The forward end 132 of the spindle 128 is secured within the bore 138 by a transverse pin 140 and a rear face 142 of the head 136 is in abutting engagement with the transverse bar 118 and prevents longitudinal movement of the spindle 128. The head 136 is bifurcated at its forward end and has forward extending arms 144 between which is pivotally located an elongated handle 146. The handle 146 has an enlarged upper end 148 with a transverse bore 150 therethrough, the bore 150 pivotally receiving a pivot pin 152 extending between the arms 144. The lower end of the elongated handle 146 is provided with a conventional knob 154.

Referring now to Figures 3 and 4 in particular, it will be seen that the spacing between the vertical bars 114 and 116 is equal to the width of the spindle nut 50 and that the bars 114 and 116 telescope within the horizontal bars 46 and 48. In order that the clamp member 14 may be moved away from and toward the clamp member 12, the spindle 128 is threadedly engaged in the threaded bore 52 of the spindle nut 50 and longitudinal movement of the clamp member 14 is controlled by the rotation of the elongated handle 146. It will be noted that the vertical bars 114 and 116 are longer than the horizontal bars 46 and 48 to insure proper support of the clamp member 14 in all positions of the vise. When the clamp member 14 is moved away from the clamp member 12, its forward movement is limited by the rod 124 engaging the rear face of the spindle nut 50.

Inasmuch as the various portions of the vice are formed of steel rather than castings, the vice is not easily broken.

Referring now to Figure 6 in particular, it will be seen that the jaw member 70 is provided with vertically extending recesses 156 and 158 along opposite edges of the rear thereof to form a back portion 160 which fits in between the upper ends of the upright legs 56 and 58. Due to this novel arrangement, the jaw member 70 is prevented from tilting or twisting. It will be understood that the jaw member 100 is secured to the clamp member 14 in the same manner.

The operation of this device will be understood from the foregoing description of the details thereof, taken in connection with the above recited objects and drawings. Further description would appear to be unnecessary.

Minor modifications of the device, varying in minor details from the embodiment of the device illustrated and described here, may be resorted to without departure from the function and scope of this invention, as defined by the appended claims.

Having described the invention, what is claimed as new is:

1. A vise comprising first and second clamp members, said first and second clamp members having, respectively, telescoped slide and guide members, a threaded shaft carried by the slide member of the first clamp member, said threaded shaft being engaged in a threaded bore of a spindle nut mounted on the guide member of the second clamp member, means for mounting said clamp members, said means engaging a rearwardly extending cylindrical portion of the second clamp guide member, the guide member of the second clamp member being in the form of a pair of spaced normally horizontal flat bars secured at their rear ends to said cylindrical portion, said normally horizontal bars being spaced apart a distance equal to the depth of the slide member of the first clamp member.

2. A vise comprising first and second clamp members, said first and second clamp members having, respectively, telescoped slide and guide members, a threaded shaft carried by the slide member of the first clamp member, said threaded shaft being engaged in a threaded bore of a spindle nut mounted on the guide member of the second clamp member, means for mounting said clamp members, said means engaging a rearwardly extending cylindrical portion of the second clamp guide member, the guide member of the second clamp member being in the form of a pair of spaced normally horizontal flat bars secured at their rear ends to said cylindrical portion, said normally horizontal bars being spaced apart a distance equal to the depth of the slide member of the first clamp member, said spindle nut extending vertically between the bars and connected thereto intermediate their ends.

3. A vise comprising first and second clamp members, said first and second clamp members having, respectively, telescoped slide and guide members, a threaded shaft carried by the slide member of the first clamp member, said threaded shaft being engaged in a threaded bore of a spindle nut mounted on the guide member of the second clamp member, means for mounting said clamp members, said means engaging a rearwardly extending cylindrical portion of the second clamp guide member, the guide member of the second clamp member being in the form of a pair of spaced normally horizontal flat bars secured at their rear ends to said cylindrical portion, said normally horizontal bars being spaced apart a distance equal to the depths of the slide member of the first clamp

member, said cylindrical portion being rotatably engaged in a clamping ring carried by a supporting base.

4. A vise comprising first and second clamp members, said first and second clamp members having, respectively, telescoped slide and guide members, a threaded shaft carried by the slide member of the first clamp member, said threaded shaft being engaged in a threaded bore of a spindle nut mounted on the guide member of the second clamp member, means for mounting said clamp members, said means engaging a rearwardly extending cylindrical portion of the second clamp guide member, the slide member of said first clamp member including a pair of spaced parallel longitudinally extending bars normally lying in vertical planes, said bars being flat and secured together at their forward ends by a transverse vertical plate, the guide member of the second clamp member being in the form of a pair of spaced normally

horizontal flat bars secured at their rear ends to said cylindrical portion, said normally horizontal bars being spaced apart a distance equal to the depth of the slide member of the first clamp member.

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