July 18, 1950 G. SUTER 2,515,533

VISE HAVING JAW RECESSES FOR MOUNTING AUXILIARY JAW ELEMENTS

Filed July 6, 1946 2 Sheets-Sheet 1

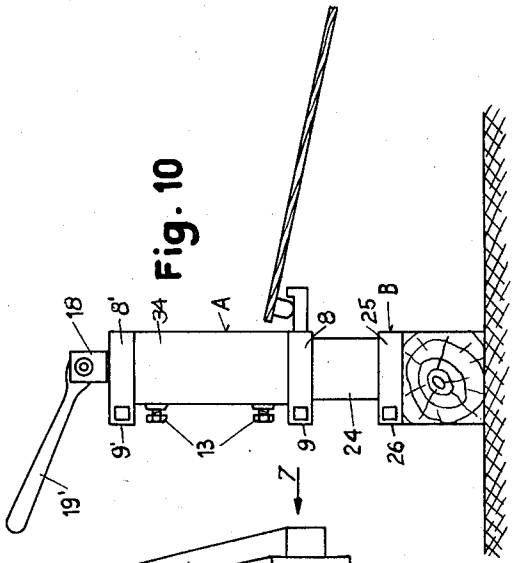


Fig. 10

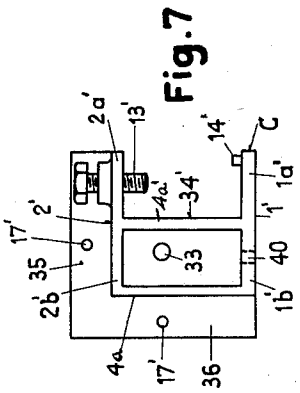


Fig. 7

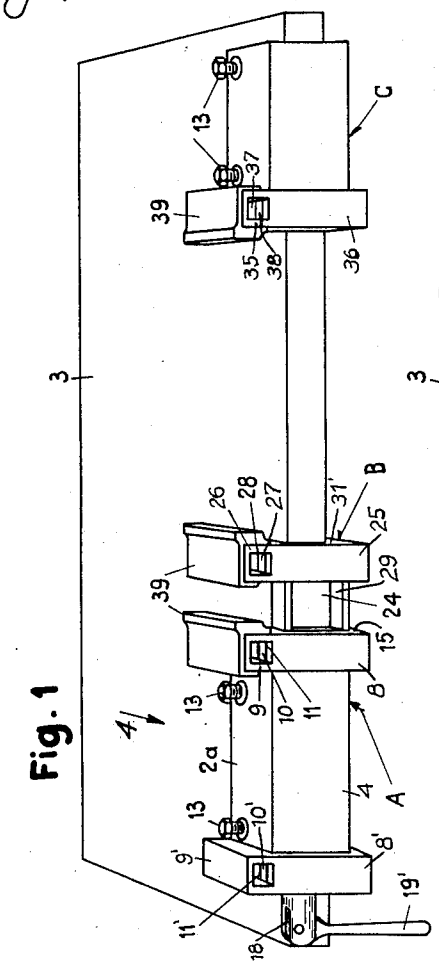


Fig. 1

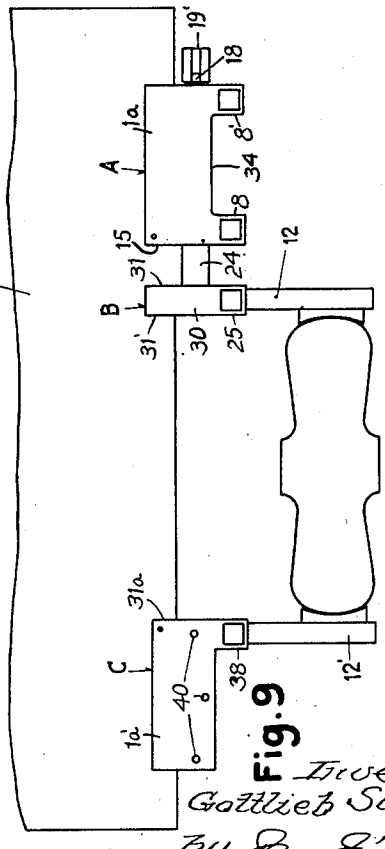


Fig. 9

Inventor
Gottlieb Suter
By
Atty.

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VISE HAVING JAW RECESSES FOR MOUNTING AUXILIARY JAW ELEMENTS

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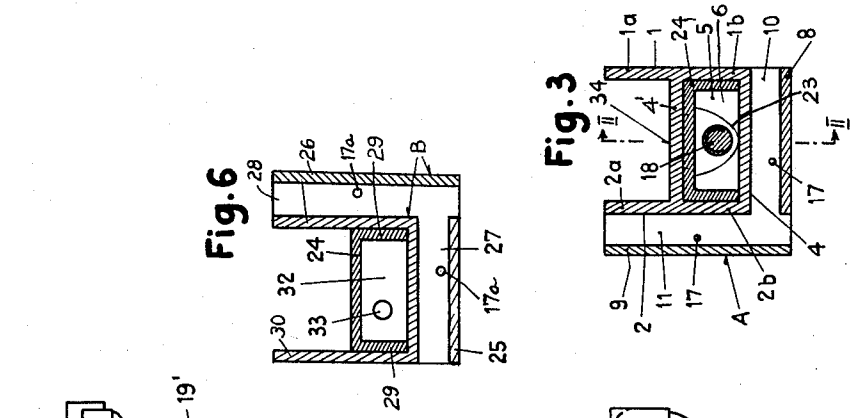


Fig. 6

Fig. 3

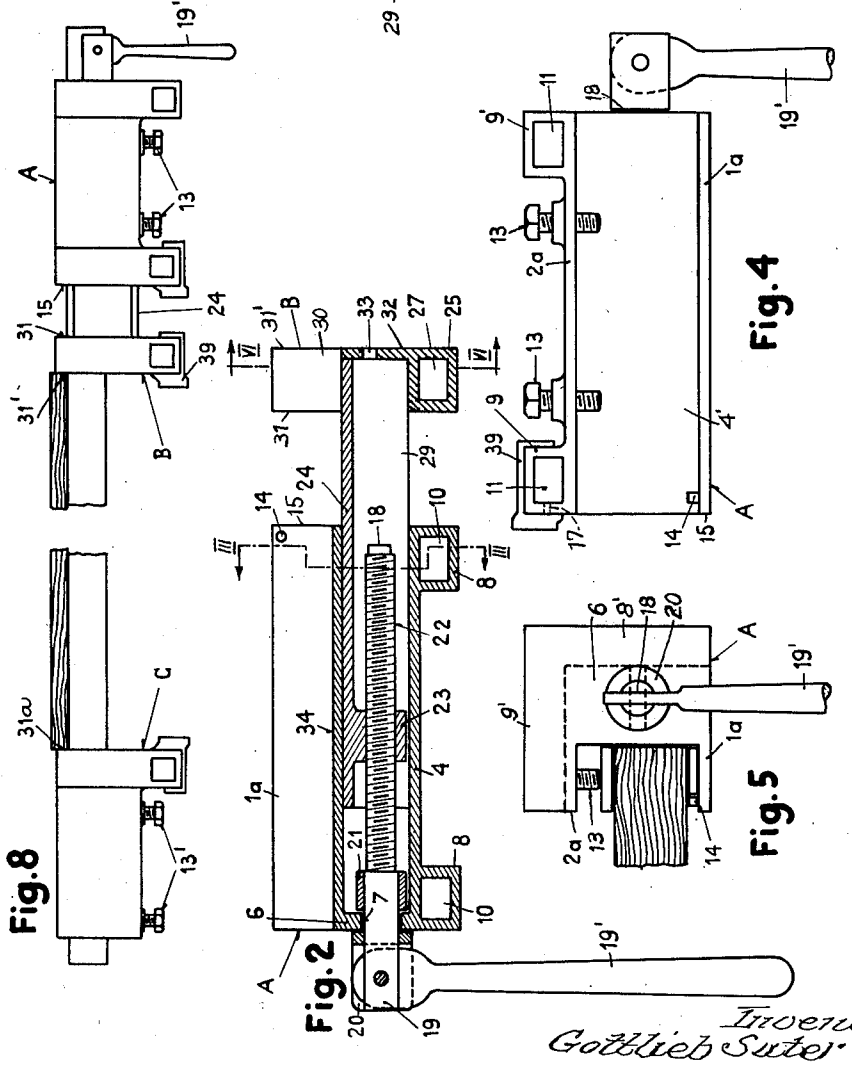


Fig. 2

Fig. 8

Fig. 4

Fig. 5

Inventor:
Gottlieb Suter
by [illegible]
Atty.

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VISE HAVING JAW RECESSES FOR MOUNTING AUXILIARY JAW ELEMENTS

Gottlieb Suter, Zurich, Switzerland

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6 Claims. (Cl. 81—33)

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The invention refers to vises and more particularly to vises having sleeve-like housings for use as jaws or for mounting auxiliary jaw elements.

The purpose of the invention is to provide a highly adaptable tool which need not be permanently fixed in position, but can be fastened to any table or bar. In addition, the device may be employed independently as a jack or the like. Further, the vise replaces the joiner's bench and vise and also can be used as an assembly tool to support large and small objects of any material, size or shape. Moreover, the vise is adapted for supporting ring-shaped bodies, such as ball bearings and tubes, from the inner side or bore in order to have the outer surface available for working. Small tools such as punches, stamps or the like can be placed therein and objects operated on thereby, and small machines such as grinding or boring machines can be applied thereto for working on objects secured in the device. This device can also be used for pressing and drawing and in the same way as a normal press, and of which the jaws offer the possibility of being used on six different sides or in six different directions and securely mounted or freely disposed. The ram may secure the object only with the operating jaw or only with the free jaw or the object may be clamped between the operated and free jaws.

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawings, wherein like reference characters indicate like parts throughout and in which:

Fig. 1 is a perspective view of a complete vise in accordance with the present invention and shows the vise applied to a bench in the normal position of operation,

Fig. 2 is a view in cross-section taken longitudinally through the ram and the operating jaw along the line II—II of Fig. 3 and on a horizontal plane with respect to Fig. 1, but, showing the operating crank turned to horizontal position,

Fig. 3 is a transverse section taken on line III—III of Fig. 2,

Fig. 4 is a side view of the ram in the direction of the arrow 4 of Fig. 1,

Fig. 5 is an end view of the ram,

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Fig. 6 is a section taken on line VI—VI of Fig. 2 through the operating jaw,

Fig. 7 is an end view in the direction of the arrow 7 of Fig. 1,

Fig. 8 is a side view in elevation of the vise mounted in inverted position for clamping thin articles,

Fig. 9 is a plan view of the vise in inverted position and shows supporting auxiliary jaw elements for clamping a special article, and

Fig. 10 is a side view of the vise employed as a jack.

Referring now to the drawings, specifically to Fig. 1, a vise, in accordance with the present invention comprises a screw ram or spindle head A, an operating jaw B and a free jaw C. The ram A comprises a body member 34 of square A-shape with parallel side plates 1 and 2 which form sides 1*b* and 2*b* and flanges 1*a* and 2*a*, respectively. The sides 1*b*, 2*b* are connected together by plates 4 and 4′ to form a guide channel 5 of rectangular section (Fig. 3). One end of the passage 5 is closed by a plate 6 (Fig. 2) which has an aperture 7 for the passage of a threaded spindle 18. U-shaped channel members are rigidly fixed to the plate 4 in spaced relation to form jaws 8 and 8′, while similarly formed U-shaped channel members are fixed to the side plate 2 to form jaws 9—9′ which are exactly at right angles to the jaws 8—8′ respectively.

These jaws 8—8′, 9—9′ are hollow and are in communication at their ends; thereby defining passages 10—10′ and 11—11′, respectively, which are exactly at right angles one to the other. The transverse section of said passages is rectangular in the constructive embodiment shown; they can however also be square, round or of any other desired form.

The flange arms 1*a* and 2*a* are adapted to embrace the edge of, for example, a table top 3 (Fig. 1) to which the clamping device can be secured by means of bolts 13 traversing the flange arm 2*a*. The flange arm 1*a* beneath the table top embodies a pin 14 or like projection which enters the table top 3 from below and opposes movement of the ram A even when highly stressed. A hole 17 is provided in at least one of the side walls of each of the jaws 8—8′, 9—9′, preferably directly beneath the outer wall thereof, said holes 17 serving for securing jaw members 39 around the jaws 8—8′, 9—9′, respectively. The end edge 15 of the side plate 1 can also be used as a clamping jaw for thin objects like plates, sheets or the like.

The threaded spindle 18 extends longitudinally

in the guide passage 5 and comprises a threaded part 22 and a non-threaded part 19 traversing the aperture 7 in the plate 6. Two collars 20, 21, are secured on the spindle part 19 on opposite sides of the plate 6 to prevent axial movement of the spindle 18 but permit its rotation. A crank 19' is pivotally mounted on the end of the spindle part 19 for rotating the spindle 18.

The spindle 18 forms the connection between the ram A and the shank 24 of the operating jaw B. The shank 24 comprises a U-shaped channel member that is slidably mounted in the guide passage 5 and carries a nut-like element 23 that is threaded on the spindle 18. By rotation of the spindle 18, by means of the crank 19', the shank 24 is moved longitudinally along the guide passage 5. At its free end the shank 24 carries hollow jaws 25, 26 which define passages 27, 28 that extend perpendicularly one to the other. The jaws 25, 26 are substantially identical to the jaws 8—8', 9—9' of the ram A and are adapted to cooperate therewith. A plate 30 is fixed to the side flange 29 of the shank 24 to correspond to the flange 1a of the ram A, an inner edge 31 of said plate 30 being adapted to cooperate with the edge 15 of the ram A in clamping thin articles. Also the jaws 25, 26 embody apertures 17a by which a protecting jaw 39 may be fastened thereto. The free end of the slide 24 is closed by a plate 32 which embodies an aperture 33 that serves as a socket for supporting operating tools such as embossing punches, stamps or the like.

The free jaw C comprises, like the ram A, a square A-shaped body member 34' having side plates 1', 2' forming sides 1b', 2b' and flanges 1a', 2a', the sides 1b', 2b' being connected by cross plates 4a, 4a'. Channel-shaped jaw elements 35, 36 are secured to the body member 34' at right angles one to the other and define passages 37, 38, respectively opening at their ends. Holes 17' are provided in the sides of the jaws 35, 36 and serve for securing a protecting jaw 39, and clamp screws 13' secure the whole to the table top 3, one or more pins 14' giving additional security. In one of the side plates 1' or 2', for example in the flange 1b', apertures 40 (of which one is shown in Fig. 7) can be provided for securing operating tools such as for example drilling, boring or grinding tools. An edge 31a of the side plate 1' may cooperate with an outer edge 31' of the side plate 30 of the jaw B.

Fig. 1 shows the normal operating position of the vise and Fig. 8 shows the device in inverted position on the bench for use in clamping thin sheets or plates. Fig. 9 shows the clamping of an object of complicated form by means of auxiliary jaw elements 12, 12' mounted in the hollow jaws 26 and 35. Fig. 10 finally shows the use of the portions A and B of the vise as a jack.

Although a certain specific embodiment of the invention has been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except in so far as is necessitated by the prior art and by the spirit of the appended claims.

What I claim is:

1. A vise comprising a body portion of square A-frame cross section to provide a closed passage and an open channel portion, clamp means on said channel portion for securing said body portion to a support, a jaw shank slidably supported in said closed passage, means for moving said jaw shank relative to said body portion, and sleeve housings extending at right angles to each other and mounted on both said jaw shank and said body portion, said sleeve housings extending perpendicularly from said jaw shank and said body portion to form confronting jaws and to removably receive auxiliary jaw elements.

2. A vise comprising a body portion of square A-frame cross section to provide a closed passage and an open channel portion, clamp means on said channel portion for securing said body portion to a support, a jaw shank slidably supported in said closed passage, means for moving said jaw shank relative to said body portion, and sleeve housings extending at right angles to each other and mounted on both said jaw shank and said body portion, said sleeve housings extending perpendicularly from said jaw shank and said body portion to form confronting jaw supports, and jaw elements removably supported by said sleeve housings.

3. A vise as defined in claim 2 wherein said jaw elements are fitted around said housings, and means for securing said jaw elements to said housings.

4. A vise as defined in claim 2 wherein said jaw elements are inserted in said sleeve housings.

5. A vise as defined in claim 1 wherein said sleeve housings are fixed on both ends of said body portion.

6. A vise comprising, in combination, a body portion of square A-frame cross section to provide a closed passage and an open channel portion, clamp means on said channel portion for securing said body portion to a support, a jaw shank slidably supported in said closed passage, means for moving said jaw shank relative to said body portion, a separate jaw member for fixed support in spaced relation to said jaw shank and body portion, and sleeve housings extending at right angles to each other and mounted on each said jaw member and said jaw shank and said body portion, said sleeve housings extending perpendicularly from said jaw member and said jaw shank and said body portion to form confronting jaws and to receive auxiliary jaw elements.

GOTTLIEB SUTER.

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