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B. FRIEDRICH

2,247,656

WISE

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2 Sheets-Sheet 1

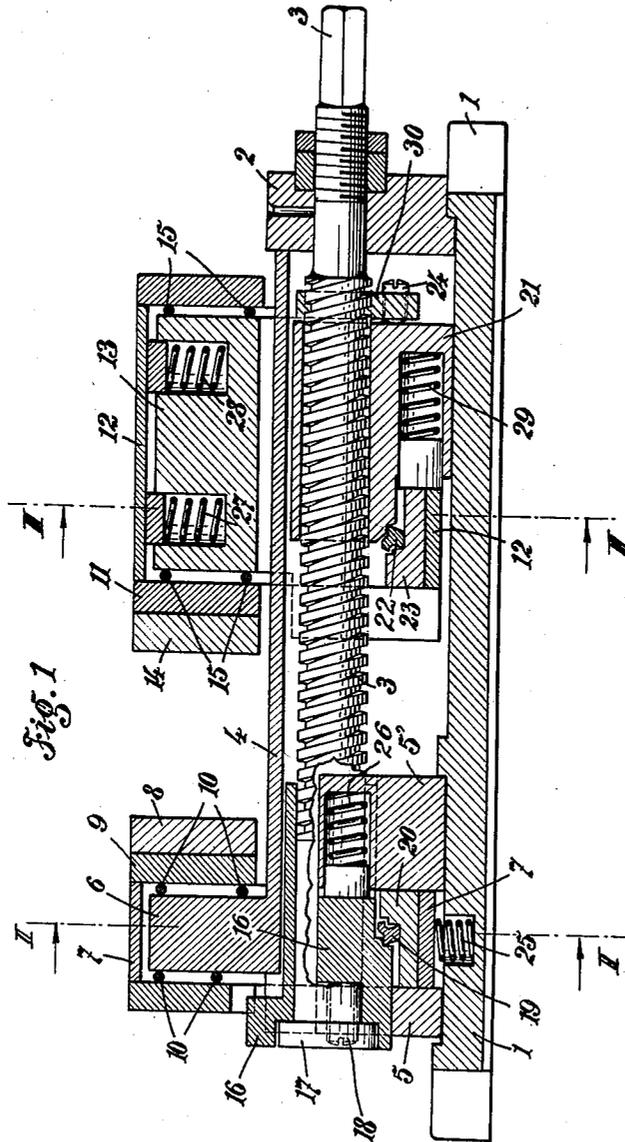


Fig. 1

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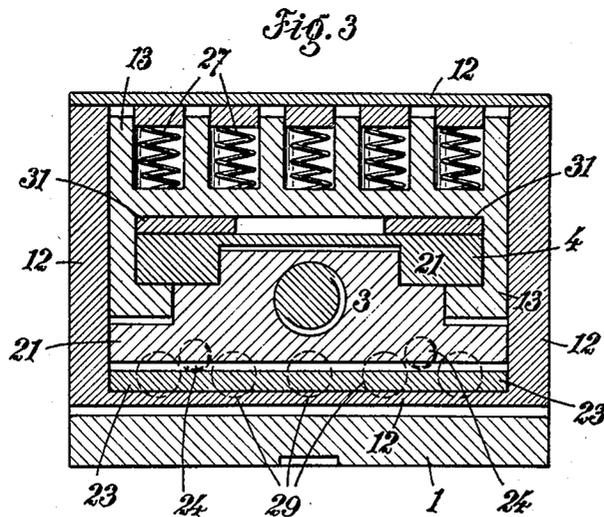
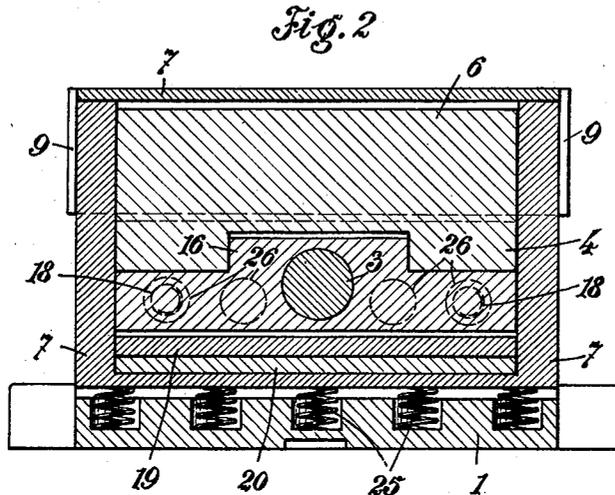
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VISE

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5 Claims. (Cl. 90-60)

Parallel vises are already known in which the jaws that grip the piece of work cooperate, during the clamping operation, with a pivoted or rocking member accommodated between the clamping device and the jaw carrier (for instance a rocker arm, eccentric or tilting member), and causing said jaws to move downwards to the vise bed, in order to grip the piece of work safely in the vise. In such vises, the downward movement of the jaws towards the vise bed always involves a movement of the jaws relatively to the jaw carriers which lie in the principal direction of movement of the jaws, i. e. in the longitudinal direction of the vise bed, and are directed towards each other or in opposite directions. Rocking movements of the individual jaws are frequently added to the said relative movements. All these additional movements of the jaws relatively to the jaw carriers are detrimental when a piece of work is being clamped.

When machining or working a piece of work, it is often important to use a vise having one jaw safely secured in the direction of the axis of the vise bed, in order to have a fixed stop for the piece of work which allows of working same at an exact predetermined distance from such a stop. The known vises the jaws of which effect a downward movement towards the vise bed when clamping, owing to the above mentioned additional movements, cannot provide such a stop for the piece of work which is a further essential disadvantage of such designs.

The invention has the purpose of providing vises with, in the moment of clamping, downwardly moving jaws, in which rocking and axial movements of the jaws relatively to the jaw carriers and the involved detrimental effects are eliminated. The invention chiefly consists in that the jaws are movable on the jaw carriers, at right angles to the vise bed and parallel to each other. To facilitate such movement balls or rollers may be inserted between the jaws and jaw carriers. If it is intended to provide the novel vise with a jaw secured in the direction of the vise spindle, such jaw, according to the present invention, is mounted on a carrier firmly secured to the vise bed, so that it may move at right angles to the bed and parallel to the other jaw, while the said other jaw is movable at right angles to the bed on a carrier, said carrier being movable by means of the vise spindle.

The drawings show by way of example a constructional form of the invention. Fig. 1 is a longitudinal section of a parallel vise according to the present invention and having one jaw immovable in the longitudinal direction; Fig. 2 is a cross section of the vise on line II—II of Fig. 1; Fig. 3 is a cross section of the vise on line III—III of Fig. 1.

On a base plate 1 is fixed a pedestal 2 for jour-

nalng the threaded spindle 3. A plate 4 formed as a guide is firmly secured to the pedestal 2 and base plate 1; the remote end of the said plate 4 is held by the support 5 and carries the jaw carrier 6. The jaw carrier 6 carries a frame-like body or jaw holder 7 to which are secured the jaws 9 provided with a lining 8. The body 7 and the jaw 9 are supported on the jaw carrier 6 by means of balls or rollers 10 moving along vertical guides in the carrier 6. The frame-like body 7 is further guided by the supports 5 and 5' firmly secured to the base plate. This guide may also be improved by balls or rollers. The other jaw 11 is also mounted on a frame-like body or jaw holder 12 and is supported by a carrier 13 movable in the longitudinal direction of the plate 4 as a slide. 14 is the lining of the movable jaw. The mounting of the jaw 11 and the frame-like body 12 on the slide-like carrier 13 is similar to that of the fixed jaw 9; balls or rollers 15 may be interposed to cooperate with vertical guides of the carrier 13. The screw spindle 3 has its abutment in a slide 16 in which the said spindle is mounted rotatably and secured by a flange 17. The slide 16, as compared with the stationary carrier 6 and the support 5, is somewhat movable in the longitudinal direction of the vise bed; this movement is limited by an adjustable stop, formed by set-screws 18 anchored in the support 5. A tilting member 19 is interposed between the slide 16 and a shoulder 20 of the frame-like body 7 so that the action is carried on to the jaw 9. The spindle 3 is spun into a further slide 21 which may be moved longitudinally by turning the spindle. This slide serves for longitudinally adjusting the movable jaw 11. Its action is also transmitted by a tilting member 22 cooperating with a shoulder 23 of the frame-like body 12 of the movable jaw 11. In order to allow of a movement of the tilting body or member, the slide 21 and the slide-like carrier 13 must be movable relatively to each other. This relative movement is limited by an adjustable stop formed by screws 24 anchored in plates 30 secured to the jaw carrier 13. 31 are guide rails which are held by screws (not shown) anchored in the carrier 13 against the path of the carrier on the slide 21; these guides serve for eliminating any play between the carrier 13 and slide 21. Both the stationary jaw and the jaw movable by means of the screw spindle, provided no piece of work is between them, must be secured in their end position more distant from the vise bed. Coiled springs serve for this purpose; they are arranged partially in horizontal, partially in vertical direction and cooperate with the assembly carrying the jaws. The carrier 7 of the fixed jaw 9 for instance is pressed upwards by vertical coiled springs while horizontal springs 26 cause the slide 16 to give way laterally and thereby likewise

urging the jaw carrier upwards by the intermediary of the tilting member 19. The analogous springs for the assembly carrying the movable jaw are marked 27, 28, and 29.

The operation of the novel parallel vise is as follows: By turning the screw spindle 3, the slide 21 which serves for shifting the movable jaw 11 is advanced towards the stationary jaw 9. The slide 21, during the said movement, carries along with it the frame-like body 12 and the jaw 11 as well as the slide-like jaw carrier 13. The movable jaw 14 and the corresponding carrying assembly advance towards the stationary jaw 9, until the piece of work accommodated between the jaws is gripped by the said jaws at both ends. The pressure generated between the piece of work and the jaws causes the tilting members 19 and 22 to swing whereby the jaws are drawn downwards along the vertical guides of their carriers. During this downward movement both the vertical springs 25, 27, and 28 and the horizontal springs 26 and 29 are compressed. When the vise is reopened, the jaws urged by the before mentioned springs are immediately moved into their upper end position remote from the vise bed and the vise is thus again suitable to receive another piece of work.

I claim:

1. In a vise, a bed having longitudinal guides, jaw members for clamping pieces of work, jaw member holders rigidly connected with said jaw members, jaw carriers movably connected with said jaw member holders and comprising guide means providing for motion of said jaw member holders relatively to said carriers in a direction at a right angle to said bed, slide members connected with said carriers and being movably connected with said bed and being guided by said longitudinal guides, a threaded spindle revolvably connected with said bed and with said slide members and effecting relative movement of said slide members with respect to one another and to said bed upon rotation of said spindle, tilting members interposed between said slide members and said jaw member holders and affording a movement of said jaw member holders relatively to said slide members and said carriers and towards said bed upon exertion of pressure on said jaw members.

2. In a vise, a bed having longitudinal guides, jaw members for clamping pieces of work, jaw member holders rigidly connected with said jaw members, jaw carriers, guide means including roller means movably interconnecting said jaw member holders and said carriers and guiding the movement of said holders relatively to said carriers at a right angle to said bed, slide members connected with said carriers and being movably connected with said bed and being guided by said longitudinal guides, a threaded spindle revolvably connected with said bed and with said slide members and effecting relative movement of said slide members with respect to one another and to said bed upon rotation of said spindle, rocking members interposed between said slide members and said jaw member holders and being adapted to rock about on axis which is substantially at a right angle to the axis of said spindle and affording a movement of said jaw member holders relatively to said slide members and said

carriers and towards said bed upon exertion of pressure on said jaw members.

3. In a vise, a bed having longitudinal guides, jaw members for clamping pieces of work, jaw carriers movably connected with said jaw members and comprising guide means guiding the relative movement of said carriers and jaw members at a right angle with respect to said bed, one of said carriers being rigidly connected with said bed, slide members connected with said carriers and being movable with respect to said bed, a threaded spindle revolvably connected with said bed and with said slide members and effecting relative movement of said slide members with respect to one another upon rotation of said spindle, rocking members interposed between said slide members and said jaw members and being adapted to rock about on axis which is substantially at a right angle to the axis of said spindle and affording a movement of said jaw members relatively to said slide members and said carriers and towards said bed upon exertion of pressure on said jaw members.

4. In a vise, a bed having longitudinal guides, jaw members for clamping pieces of work, jaw carriers movably connected with said jaw members and comprising guide means guiding the relative movement of said carriers and jaw members at a right angle with respect to said bed, one of said carriers being rigidly connected with said bed, slide members connected with said carriers and being movable with respect to said bed, a threaded spindle revolvably connected with said bed and with said slide members and effecting relative movement of said slide members with respect to one another upon rotation of said spindle, rocking members interposed between said slide members and said jaw members and being adapted to rock about on axis which is substantially at a right angle to the axis of said spindle and affording a movement of said jaw members relatively to said slide members and said carriers and towards said bed upon exertion of pressure on said jaw members, an abutment provided at one end of said spindle and abutting against that one of said slide members which is connected, by means of one of said rocking members, with the carrier which is rigidly connected with said bed.

5. In a vise, a bed having longitudinal guides, jaw members for clamping pieces of work, jaw carriers movably connected with said jaw members and comprising guide means guiding the relative movement of said carriers and jaw members at a right angle with respect to said bed, one of said carriers being rigidly connected with said bed, slide members connected with said carriers and being movable with respect to said bed, a threaded spindle revolvably connected with said bed and with said slide members and effecting relative movement of said slide members with respect to one another upon rotation of said spindle, rocking members interposed between said slide members and said jaw members and being adapted to rock about on axis which is substantially at a right angle to the axis of said spindle and affording a movement of said jaw members relatively to said slide members and said carriers and towards said bed upon exertion of pressure on said jaw members, one of said slide members being guided by said longitudinal guides.

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