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APPLICATION FILED SEPT. 28, 1911.

1,017,131.

Patented Feb. 13, 1912.

Fig. 1

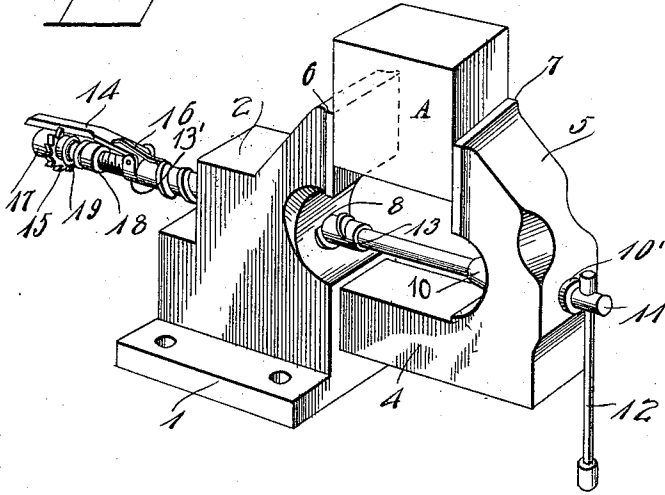


Fig. 3

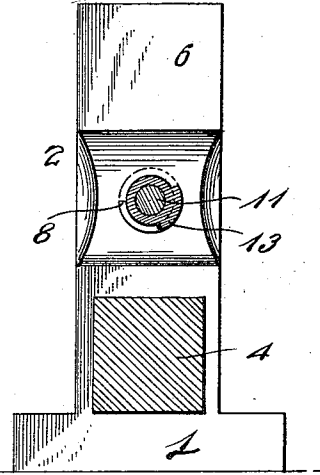
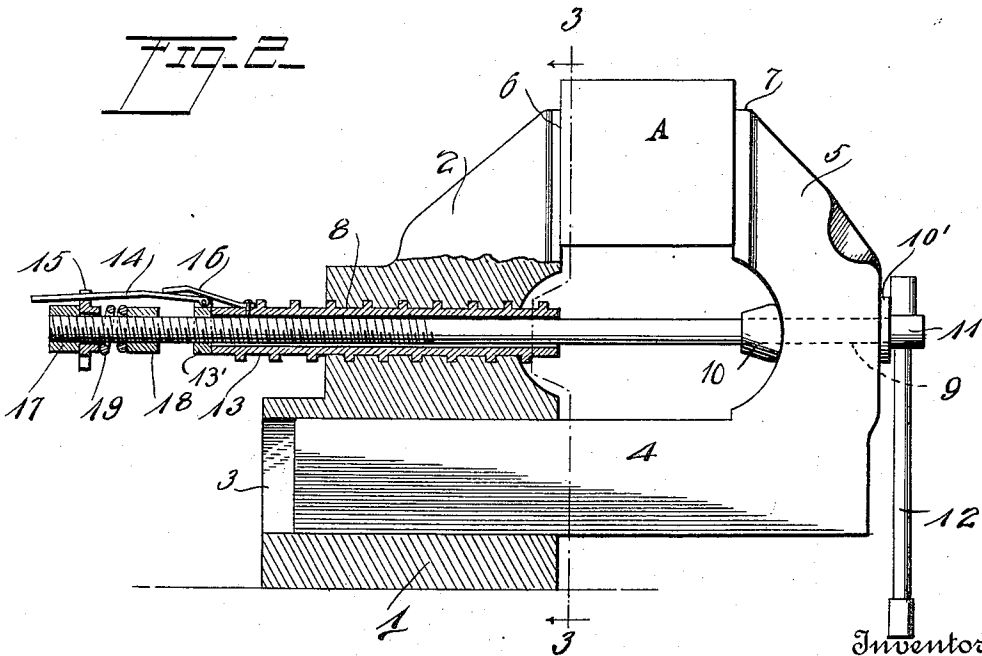


Fig. 2



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UNITED STATES PATENT OFFICE.

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1,017,131.

Specification of Letters Patent.

Patented Feb. 13, 1912.

Application filed September 28, 1911. Serial No. 651,820.

To all whom it may concern:

Be it known that I, WILLIAM R. BUCHANAN, a citizen of the United States, residing at Carrsville, in the county of Livingston and State of Kentucky, have invented certain new and useful Improvements in Vises; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in vises having threads of different pitch and the necessary appurtenances thereto to rapidly adjust the jaws of the vise and to apply the pressure with greatly increased power, and whereby both operations may be performed with one hand by a continuous movement of the same device.

The object of the invention is to provide an automatic, quick acting vise of this character, having an improved construction of screw which may be used in any kind of vise, pressure or clamp that requires a quick action and strong holding capacity.

With this and other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings: Figure 1 represents a perspective view of a vise constructed in accordance with this invention; Fig. 2 is a side elevation thereof partly in longitudinal section; Fig. 3 is a transverse vertical section taken on line 3—3 of Fig. 2.

In the embodiment illustrated a bed plate 1 is shown having a fixed jaw 2 with an angular opening 3 therein in which is slidably mounted the shank 4 of a movable jaw, 5, said shank supporting and maintaining said movable jaw in proper position relative to the jaw 2. These jaws 2 and 5 have opposed gripping faces 6 and 7 and longitudinally aligned bores 8 and 9 formed therein below the gripping faces thereof for the purposes to be described. A collar 10 is fixed on the smooth unthreaded end of a power screw 11 adjacent the inner end of the bore 9, and another collar 10' is secured to said screw end adjacent the outer end of the bore 9 and between the outer face of the jaw 5, and a crank handle or lever 12 secured to said screw end. The bore 8 has a coarse thread to receive a coarse threaded hollow speed screw 13 for adjusting the jaw 5 when the

jaws are free. This screw 13 has a nut 13' fixed to its outer end and threaded internally to engage the threads of the outer screw 11. A pawl 14 is fixed to the outer end of the speed screw and adapted to engage a ratchet wheel 15 loosely mounted on the threaded outer end of the power screw 11, said pawl being held yieldably in engagement with said ratchet by a suitable spring 16. The power screw 11 extends loosely through the hollow speed screw and is of a length considerably greater than said speed screw, having fixed to its outer threaded end a nut or collar 17. Another nut 18 is engaged with said screw 11, at a point spaced inwardly from the nut 17, and a coiled spring 19 is arranged between the ratchet 15 and said nut 18 to yieldably hold said ratchet in frictional engagement with the nut 17.

The operation of this device is as follows: When the jaws 2 and 5 are free, the turning of the handle or lever 12 turns the coarse threaded speed screw 13 and the power screw 11 as a single element owing to their connection by means of the pawl 14 and ratchet wheel 15 which latter is frictionally engaged with the nut or collar 17 fixed to said screw 11, and the friction of said ratchet wheel with said collar is sufficient to carry the hollow speed screw with the screw 11 when no greater resistance occurs than in adjusting the jaw 5. The turning of the coarse speed screw 13 causes the jaw 5 to be quickly moved toward or away from jaw 2, according to the direction in which said screw is rotated. In the operation of clamping the block A or other article to be held, the pressure is produced by continuing to turn lever 12 and with it the screw 11 to the right. The first resistance offered to the jaw 5 overcomes the frictional engagement of the ratchet 15 with the collar 17, thus stopping the action of the screw 13 and the power screw 11 continues to turn in said screw 13 and ratchet 15 and exerts power for clamping the article firmly between the jaws, the jaw 5 being thus advanced by the single screw 11, according to the pitch of its threads. It will thus be observed that the automatic advantages are obtained with a very simplified mechanism and a corresponding reduction in power necessary for operating it.

From the foregoing description taken in connection with the accompanying draw-

ings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion
5 and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention defined and claimed.

Having thus described my invention, what
10 I claim is:

1. In a vise the combination with a stationary jaw, a movable jaw, cooperating means carried by said stationary and movable jaws for guiding said movable jaw
15 relative to said fixed jaw, bores in said jaws arranged in longitudinal alinement, the bore in the stationary jaw having coarse threads formed therein, a hollow speed screw mounted in said threaded bore and having coarse
20 external threads operatively engaged with said bore, a power screw having an unthreaded end mounted in the bore of said movable jaw, said power screw extending through said hollow speed screw, and co-
25 operating means carried by said screws for holding them in engagement, and means for releasing said screws when resistance is offered to said movable jaw.

2. In a vise the combination of a fixed
30 and a movable jaw, a hollow speed screw rotatably mounted in said fixed jaw, a power screw revolubly mounted in said movable jaw and in said hollow speed screw, a collar fixed to the threaded end of said
35 power screw, a ratchet yieldably held in frictional engagement with said collar, and means on said speed screw for engaging said ratchet to connect said screws when no resistance is offered to the movable jaw and
40 actuating means connected with said power screw.

3. In a vise the combination of a fixed and a movable jaw, a hollow speed screw rotatably mounted in said fixed jaw, a

power screw revolubly mounted in said movable jaw and in said hollow speed screw, a collar fixed to the threaded end of said power screw, a ratchet yieldably held in frictional engagement with said collar, and a spring pressed pawl mounted on said
50 speed screw and engaging said ratchet wheel whereby said screws are connected and adapted to operate as a single element when no resistance is offered to the movable jaw.

4. In a vise the combination of a fixed jaw having an angular opening, an angular shank slidably mounted in said opening, bores in said jaws arranged in longitudinal alinement and in a plane parallel with said
60 shank, a hollow coarse threaded speed screw mounted in said fixed jaw, a power screw loosely mounted in said movable jaw and in said hollow speed screw and projecting beyond the outer end of said speed screw, the
65 projecting end of said power screw having a collar fixed thereto, another collar fixed to said screw and spaced inwardly from said first mentioned collar, a ratchet loosely mounted on said screw between said collars,
70 a coiled spring arranged on said screw between the inner collar and said ratchet wheel to yieldably hold said ratchet wheel in frictional engagement with said outer collar, a spring pressed pawl fixed to said
75 speed screw and normally engaged with said ratchet wheel whereby said screws are connected when turned in one direction and released when turned in the other direction, and means for actuating said screws.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM R. BUCHANAN.

Witnesses:

NAPOLEON M. SMOCK,
JOHN CAMPBELL.