

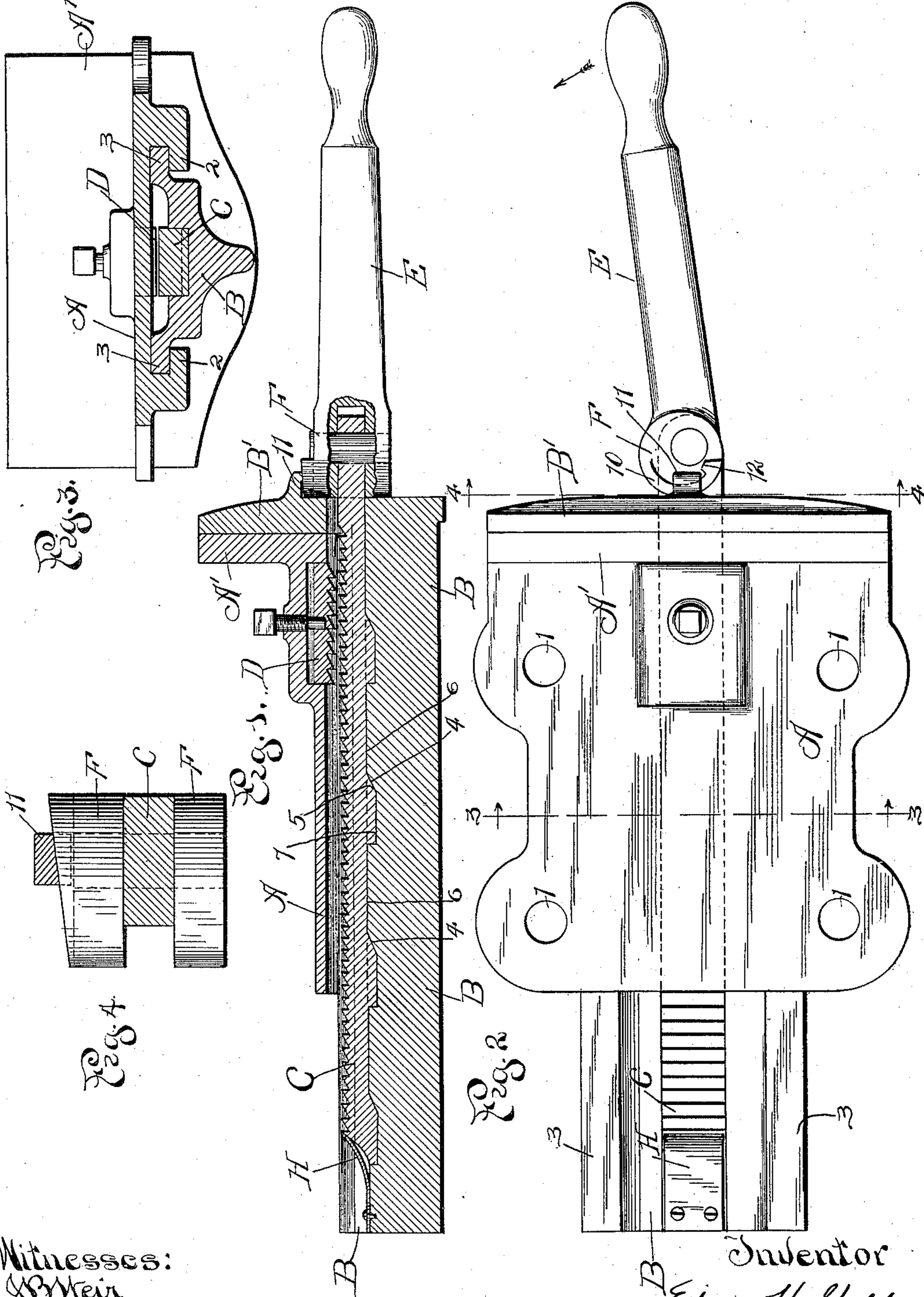
No. 656,793.

Patented Aug. 28, 1900.

E. H. SHELDON.
BENCH VISE.

(Application filed Jan. 9, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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BENCH-VISE.

SPECIFICATION forming part of Letters Patent No. 656,793, dated August 28, 1900.

Application filed January 9, 1899. Serial No. 701,634. (No model.)

To all whom it may concern:

Be it known that I, EDGAR H. SHELDON, a citizen of the United States of America, and a resident of Oak Park, Cook county, Illinois, have invented certain new and useful Improvements in Bench-Vises, of which the following is a specification.

My invention relates to a construction of vise especially adapted for attachment to a bench or table.

Prominent objects of my invention are to provide a simple, inexpensive, and practical construction of bench-vise, to reduce to a minimum its number of parts, to simplify its operating mechanism and method of operation, to render its operation easy and natural, and to arrange for the application of the gripping force in the most advantageous manner.

To the attainment of the foregoing and other desirable ends my invention consists in matters hereinafter set forth.

In the accompanying drawings, Figures 1 and 2 are a longitudinal vertical section and a plan view, respectively, of a bench-vise embodying my invention. Fig. 3 is a transverse vertical section taken on line 3 3 in Fig. 1; and Fig. 4 is a transverse vertical section taken on line 4 4 in Fig. 1, on an enlarged scale.

In the vise illustrated the member A is the fixed or stationary member and is constructed with a fixed or stationary jaw A'. This fixed member is to be secured to the bench or table and to such end can be conveniently provided with screw-holes 1 1, Fig. 2, through which screws can be passed. The movable member B, carrying the movable jaw B', is positioned below the fixed member A and made longitudinally movable relatively to the latter. This endwise movement is permitted by the inwardly-extending longitudinal guides or tracks 2 2, Fig. 3, formed on the fixed member A and adapted to engage and support the edge portions 3 3 of the movable member B.

The movable member B is provided with a longitudinally-sliding rack-bar C, which is arranged to slide relatively to said member, and is to such end disposed within a suitable guide or slide way provided by a groove or channel formed in the upper surface of the

member B. The rack-bar is arranged so that when moved forward it will be elevated, a simple construction for this purpose being to provide the floor of the guideway for the rack with a series of inclines 4 4 and to provide the bottom of the rack with a corresponding series of cooperating inclines 5 5. The slide-way-surfaces 6 6 next forward of the inclined surfaces 4 4 and the rack-surfaces 7 7 next in the rear of the inclines 5 5 are level or horizontal, so that when the rack has been moved forward and elevated an additional or supplemental forward movement of the rack relatively to the movable member B, or, what amounts to the same thing, an additional or supplemental movement of that member relatively to the rack, will not cause the latter to rise farther.

The fixed member A is provided with a fixed rack-section D, which is arranged immediately above the rack-bar C and in such position that its teeth are free and disengaged from the teeth of such rack-bar when the latter is in its lowered position, but will become securely engaged therewith when the same has been elevated by a forward movement relatively to the movable member B. The forward end of the sliding rack-bar C extends through the movable jaw B' and is provided with a pivotally-attached and horizontally-swinging hand-lever E, having a cam F at its inner or rear end. The cam F is constructed in the form of a curve with a continually-lessening degree of curvature, as best shown in Fig. 2, so that when the hand-lever E is swung toward the vise, as indicated by the arrow in said figure, it will cause a correspondingly-progressive relative movement between the rack-bar C and the movable member B. This movement will be either a forward movement of the rack-bar or a rearward movement of the movable member B, according to which one of the two is most effectively held against movement. By such arrangement and construction it will be seen that when the lever E is in its normal position, preferably out straight—i. e., in alignment with the sliding rack-bar C—the rack-bar will be disengaged from the rack-section D and the movable member B can be freely slid in or out to any desired extent, so as to bring the movable jaw B' into position against

the work to be gripped. When the movable jaw B' is so positioned, the hand-lever E is swung, as indicated by the arrow in Fig. 2, and so causes a relative movement between the sliding rack-bar C and the movable member B. As the work between the two jaws of the device offers a resistance to the rearward movement of the movable member B, while the rack-bar C is perfectly free to move, the first portion of this swinging movement of the lever E causes practically no movement on the part of the movable member B; but it causes the rack-bar C to move forward and in so doing to rise and engage the rack-section D on the fixed member. By this engagement the rack-bar C is held so securely that it is locked against movement relatively to the fixed member A. The continued swinging movement of the hand-lever E therefore causes the movable member B to move rearwardly and the jaw B' to firmly and securely grip the work. When it is desired to release the work, the hand-lever E can be swung back, so as to move the rack-bar C rearwardly and disengage it from the rack-section D, whereupon the movable member B can be drawn out, so as to separate the jaw B' from the fixed jaw A'. It will be observed that in my device the rack-section D is rigid with the fixed member A and that the engagement of the rack-section D by the rack-bar is caused by the lateral shifting movement which is imparted to the latter by its longitudinal movement in contradistinction to a device having the rack-section loose and subject to a spring tending to force it normally into engagement with a longitudinally-movable rack-bar which reciprocates without an accompanying lateral shift and also having a pair of guide-bars arranged to move the movable rack-section out of engagement with the movable rack-bar and to allow it to move into engagement with the same, as I am aware it has heretofore been proposed to construct.

It is obvious that my construction is much more simple and practical and much less expensive and complicated than the one referred to, while it at the same time secures a positive and much more effective action.

The hand-lever E and rack-bar C are conveniently held against separation from the movable member B' by a track or guide 10 on the upper face of the cam F and a lug 11, formed on the movable member B and adapted to engage the track or guide 10 on the cam F. The track or guide 10 is downwardly inclined, as best shown in Figs. 1 and 4, so as to allow the rack-bar C to rise as it is drawn forward. This arrangement also serves to depress the forward end of the rack-bar C when the hand-lever E is swung back to its normal position.

As an arrangement for stopping the lever E when it has been swung back to its normal position, which is desirably in alignment with the rack-bar C, one end of the track or guide 10 is provided with a lug 12, which is adapt-

ed to engage the lug 11 on the movable member B when the handle E has reached that position. The rear end of the rack-bar C can be automatically depressed by a spring H, secured to the rear end of the movable member B.

It will be seen that my improved vise is simple, inexpensive, easy to operate, and very effective in operation.

It will be observed that in its broader features my invention contemplates a longitudinally-movable slide and a pair of cooperating engaging devices, one on the slide and the other on the fixed member of the device, for in reality the rack-bar C is a longitudinally-movable slide, and its teeth and those of the rack-section D are cooperating engaging devices. It will be further observed that the hand-lever E, with its cam F, constitutes a swinging lever for causing a relative longitudinal shifting movement between the movable member and the slide and is pivotally connected to one of the same and arranged to act upon the other and also that the inclines 4 4 and 5 5 comprise one form of means for shifting the slide laterally when it is drawn in a forward direction. I have called attention to this broader view of these devices in order to indicate the scope to which I consider the invention entitled.

What I claim is—

1. In a vise, the combination with the fixed and movable members respectively providing the fixed and movable jaws, of a longitudinally-movable slide carried by and arranged for movement relatively to, the movable member; a pair of cooperating engaging devices, one rigid with the fixed member, and the other carried by the movable slide; a swinging lever for causing a relative reciprocation between the slide and said movable member, said lever being pivotally connected to one of the same, and arranged to act upon the other; and means for causing the movable slide to shift laterally and bodily in its forward movement to an extent to cause the engagement of the engaging devices on it and on the fixed member.

2. In a vise, the combination with the fixed and movable members respectively providing the fixed and movable jaws, of a longitudinally-movable rack-bar carried by, and arranged for movement relatively to, the movable member, and extended forwardly through the movable jaw; inclines on the movable member and on the rack-bar for causing the bodily elevation of the latter when it is moved forwardly; a rack-section rigid with the fixed member, and positioned to engage the rack-bar when the latter is elevated; a hand-lever pivotally connected with the forward end of the rack-bar and constructed with a cam which is arranged to act against the front face of the movable jaw and is adapted to cause a relative longitudinal movement between the rack-bar and the movable member; and means for preventing the separation of

the rack-bar and attached hand-lever from the movable member.

3. A bench-vise comprising fixed and movable members respectively providing fixed
5 and movable jaws; a rack-bar arranged for longitudinal reciprocation within a guide-way formed in the upper surface of the movable member; inclines on the floor of the guideway and on the bottom of the rack for
10 causing the elevation of the latter when it is moved forwardly; a rack-section rigid with the fixed member, and positioned above the rack-bar so as to engage the same when it is elevated; a hand-lever pivotally connected
15 with the forward end of the rack-bar and constructed with a cam which is arranged to act

against the front face of the movable jaw, and is adapted to cause a relative longitudinal shifting movement between the rack-bar and the movable member; a guide or track 20 arranged upon the upper face of said cam and constructed with an inclined surface; and a lug on the movable jaw, adapted to engage said guide or track; substantially as described and for the purpose set forth. 25

Signed by me at Chicago, Illinois, this 6th day of January, 1899.

EDGAR H. SHELDON.

Witnesses:

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