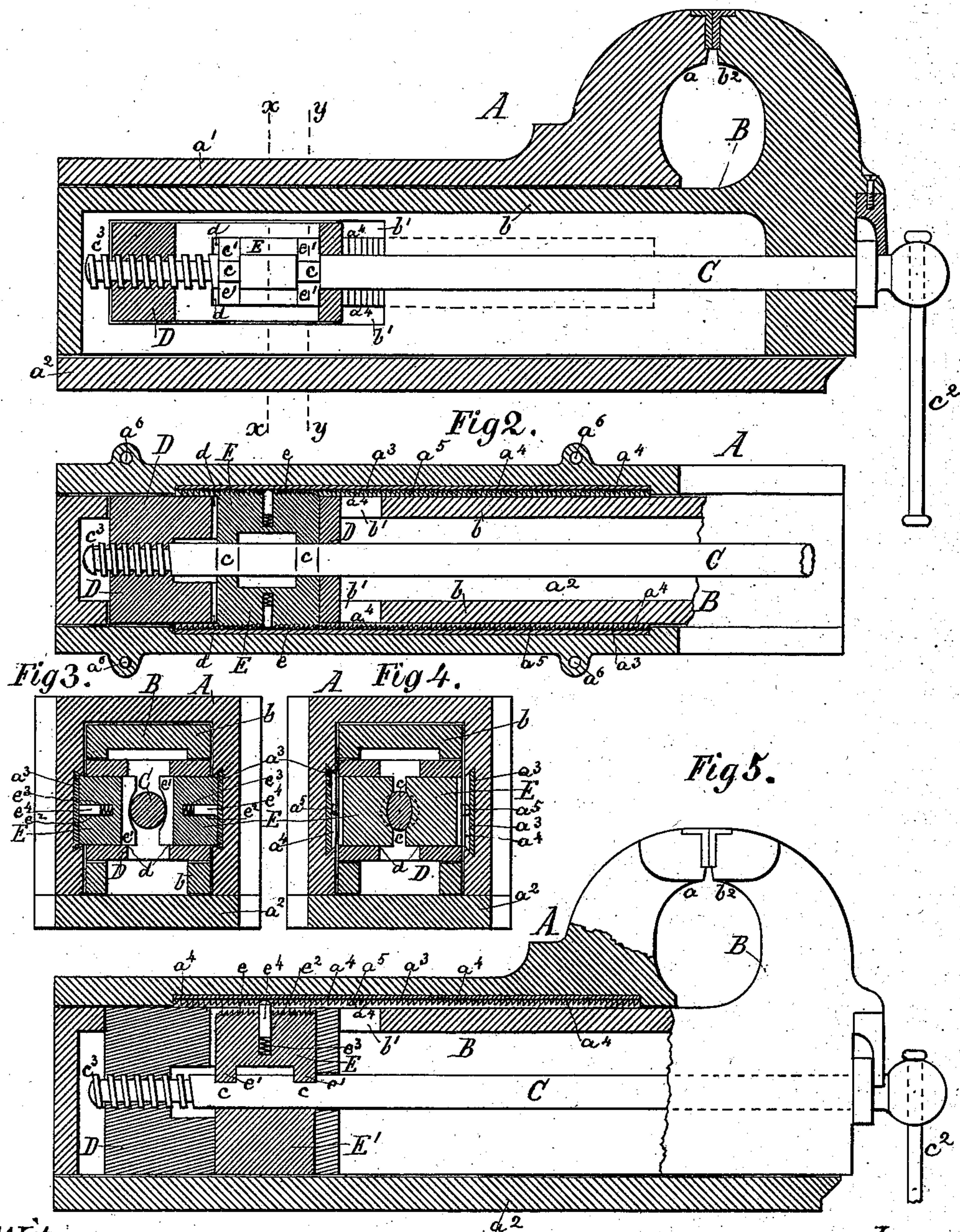


Patented Apr. 17, 1888.

Fig 1.



Robert L. Fennick

Mason, Fenwick ^{by his father} and Lawrence

UNITED STATES PATENT OFFICE.

DAVID W. STARKEY, OF APPLETON, WISCONSIN.

WISE.

SPECIFICATION forming part of Letters Patent No. 381,178, dated April 17, 1888.

Application filed July 23, 1887. Serial No. 245,114. (No model.)

To all whom it may concern:

Be it known that I, DAVID W. STARKEY, a citizen of the United States, residing at Appleton, in the county of Outagamie and State of Wisconsin, have invented certain new and useful Improvements in Vises; and I do hereby 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.

My invention consists in a parallel-jaw vise operated by a screw, and so constructed, combined, and arranged in its parts, as will be hereinafter described and specifically claimed, that the movable jaw is readily moved to any desired position without the intervention of the screw, the nut locked to the outer or stationary jaw by means of one or more cams cut on the periphery of the screw-shaft and operating upon and forcing outward one or more toothed blocks into engagement with one or more toothed racks permanently attached to the outer or stationary jaw, and the grip of the jaw produced; and, when desired, the nut can be readily unlocked by a backward movement of the screw-shaft.

In the accompanying drawings, Figure 1 is a vertical section along the axis of a parallel-jaw vise of my improved construction, the screw-shaft, its screw-thread, cams, handle, and rack not being sectioned. Fig. 2 is a horizontal section of a portion of the vise in the axial line of the same. In this view the screw-shaft, screw, and spring-pins are not sectioned. Fig. 3 is a transverse section in the line $x x$ of Fig. 1. Fig. 4 is a transverse section in the line $y y$ of the same. Fig. 5 is a vertical axial section in part of a modified construction of the vise.

The letter A in the drawings represents the stationary part of the vise; B, the sliding part; C, the screw-shaft provided with screw-thread c^3 and one or more cams, c , on its periphery. D is the nut, provided with blocks E, one or both of which are constructed with teeth e .

The stationary part A of the vise is provided with the usual jaw, a , and a tail-housing, a' , and it is also provided with one or more toothed racks, a^3 , having ratchet-teeth a^4 , as shown. The racks are suitably embedded in and secured to the housing a' , and are flush with its inner surfaces, as shown.

The guide b of the part B of the vise contains the nut D, which is of oblong form, and is fitted into lateral slots b' in the guide b , said slots being slightly longer than the nut, in order to allow the same longitudinal play, sufficient to effect the locking of the nut and the gripping of the jaws. This nut is also provided with transverse horizontal slots d , into which ratchet-toothed blocks E are fitted. The outer facings of the blocks E stand in line with ratchet racks a^3 of the stationary part A, and its ratchet-teeth e , which are similar to the ratchet-teeth a^4 , mesh with said teeth a^4 , and the blocks are moved outward by the cams c , as will be seen. The blocks E are provided with lugs e' , which are operated upon by the cams c on the periphery c' of the screw-shaft C. When the screw-shaft C is turned by means of the vise-handle c^2 , the cams c move the blocks E outward, radially upon the periphery of the shaft, and the ratchet-teeth e of the blocks engaging with the racks a^3 cause the blocks to become securely interlocked with the teeth a^4 of the same, and the nut D being thus securely locked to the stationary jaw A, the threaded portion c^3 of the screw-shaft C, the sliding part B, and its jaw b^2 , will be forced toward the jaw a and upon the article to be clamped between the said jaws by a further turning of the screw-shaft C.

The blocks E are provided with sockets e^2 , in which springs e^3 and pins e^4 are placed, said pins having an outward bearing against a grooved surface, a^5 , cut longitudinally in the middle of the racks a^3 . By these spring-pins the blocks are caused to move out of engagement with the racks a^3 when the screw-shaft C is turned back, so as to move the cams out of the way of the blocks. By providing the grooves a^5 the pins e^4 are not required to slide over ratchet-teeth a^4 of ratchet a^3 , thereby avoiding noise and wear of the pins and ratchet-teeth.

In the vise shown in Fig. 5 there is only one ratchet-rack, a^3 , and one sliding block, E, with ratchet-teeth e , the rack a^3 being embedded in the top portion of the housing a' and the block E resting against a cam or cams on the top of the screw-shaft C, the other parts being constructed as shown, and operated similar to those above described. In this construction, below the screw-shaft C and the block E, a blank block, E' , is substituted for a toothed

block, E, and it is inserted into the nut D, being caused to bear against the lower surface of the screw and the bottom portion of the part A of the vise, and serving to prevent the screw
 5 from deviating from its horizontal position when under a strain. This modified construction, being somewhat lighter than the above-described construction, is well adapted for the performance of light work, while the former
 10 answers the best for heavier classes of work.

It will be seen from the foregoing specification, first, that while the screw-shaft C is turned back in a manner to move the cams out of the way the blocks are disengaged from the racks
 15 a^3 by the action of springs or other cause, and that when this takes place the part B of the vise can be readily moved forward or backward without turning the screw; and, second, by the adjustment just described the jaws a
 20 and b^2 can be opened quickly to receive articles to be clamped between them, and then can be, by turning the screw-shaft forward, caused to close upon the article with any desired grip. During the last-named operation
 25 the cams moved the blocks outward and caused them to engage with the racks, and this done a continuation of the turning of the screw-shaft forward produced the locking of the nut and grip of the jaws.

30 In the modification shown in Fig. 5 one cam may be dispensed with; also the spring and pin may be left off and the block allowed to adjust itself out of engagement by its gravity.

What I claim as my invention is—

35 1. The parallel jaw-vise provided with one or more locking-racks, a^3 , a nut, D, having a forward extension with slots b' , toothed blocks E, a shaft with a screw and one or more cams, said shaft having its cams formed directly
 40 upon its periphery forward of the nut, and the

nut having the said toothed blocks set into its oblong slots and sliding back and forth in said slots, substantially as and for the purpose described.

2. In a parallel vise, A B, the combination 45 of the housing a' , having one or more racks, a^3 , the screw-shaft C, having screw-threaded portion c^3 , and one or more cams formed directly on its periphery and within its greatest diameter and forward of the screw-thread of 50 the nut, the nut D, having slot d , and blocks having lugs e' , provided with teeth, substantially as and for the purpose described.

3. In the described parallel vise, the blocks E, having spring e^3 and pin e^4 , in combination 55 with the rack a^3 , having groove a^3 , and operating screw-shaft C, substantially as and for the purpose described.

4. In combination, a parallel jaw vise operated by a screw and constructed and arranged 60 in the parts, substantially as described—to wit, having a movable jaw which is readily moved to any desired position without the intervention of the screw, a combined nut and case, D, holding the toothed blocks E, which, by the 65 intervention of the cams, can be locked to the outer or stationary jaw, a cam or cams formed on the periphery of the screw-shaft contiguous to the screw-threaded portion of said shaft, one or more toothed blocks containing disengaging pins or studs e^4 , movable outward radially by said cams, and a rack bar or bars, 70 all for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID W. STARKEY.

Witnesses:

CHARLES F. TOTMAN,
 H. F. STONE.