(Model.) 2 Sheets—Sheet 1.

E. STOECKLIN.

VISE.

No. 394,793. Patented Dec. 18, 1888.

Fig. 1.

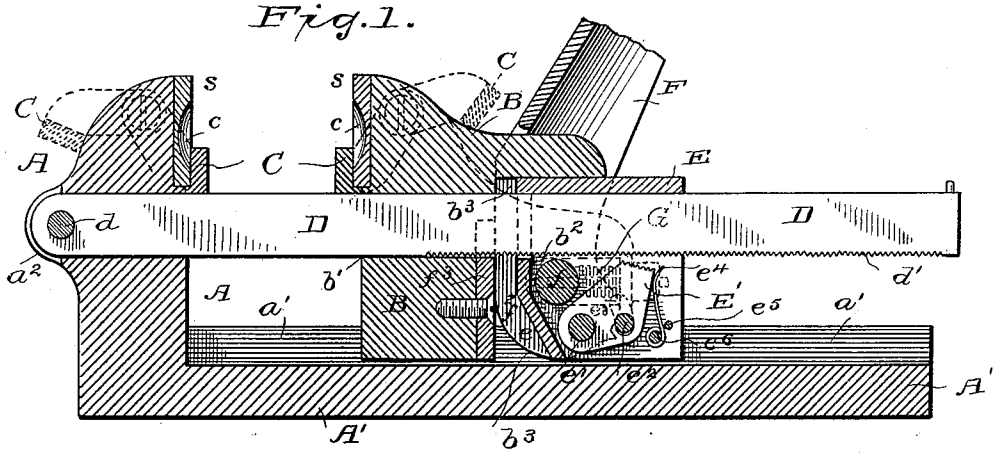
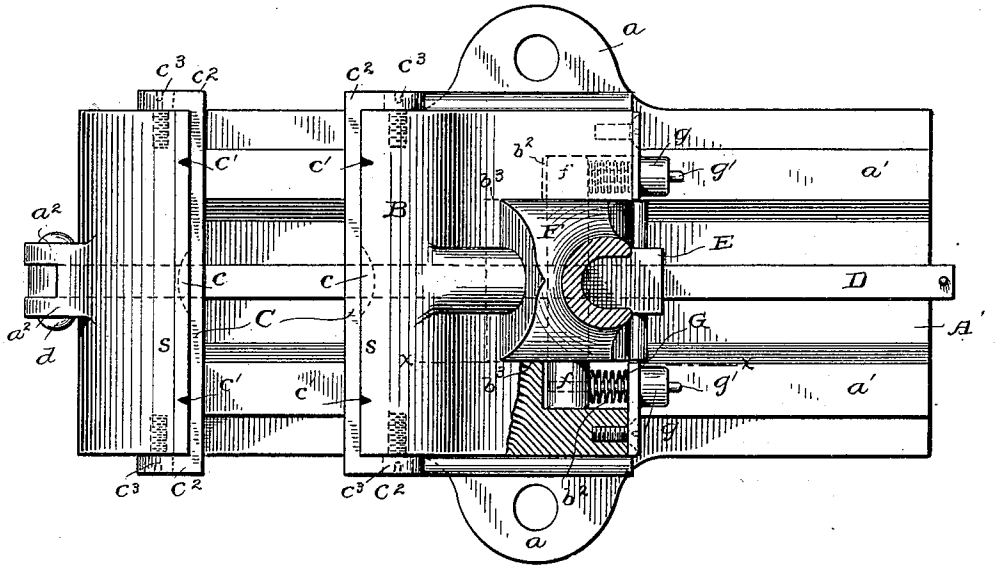


Fig. 2.



Witnesses,
H. A. Lamb
Geo. Finckel.

Inventor,
Ernest Stoecklin,
per Brown & Hall
Attorneys.

N. PETERS, Photo-Lithographer, Washington, D. C.

(Model.) 2 Sheets—Sheet 2.

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Fig. 3.

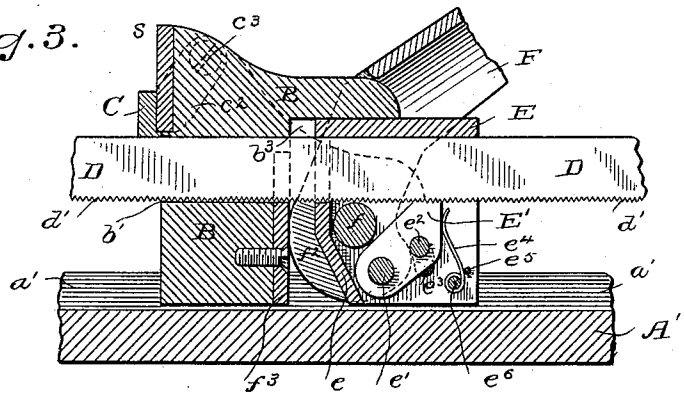


Fig. 5.

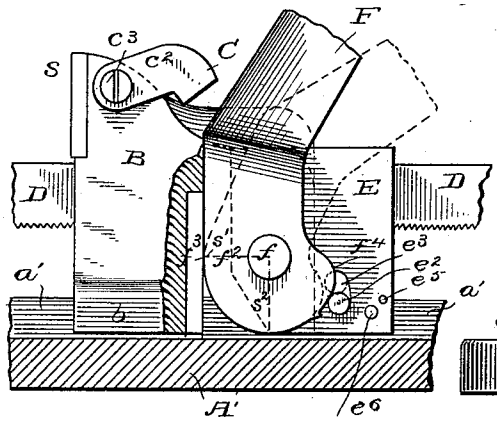
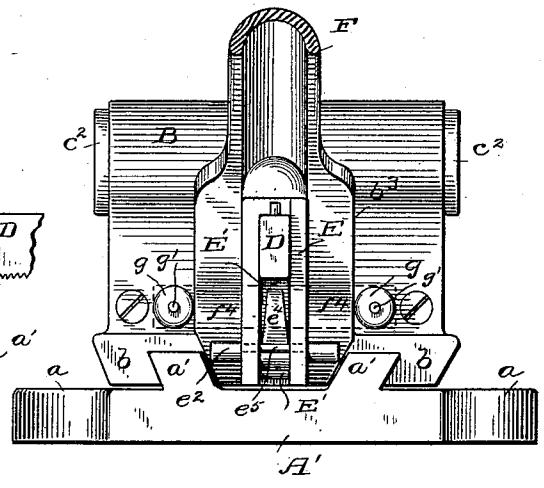


Fig. 4.



Witnesses,
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Geo. M. Finckel

Inventor,
Ernest Stoecklin
per Brown & Hall
Attorneys.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ERNEST STOECKLIN, OF NEW YORK, N. Y.

VISE.

SPECIFICATION forming part of Letters Patent No. 394,793, dated December 18, 1888.

Application filed February 1, 1886. Serial No. 190,424. (Model.)

To all whom it may concern:

Be it known that I, ERNEST STOECKLIN, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Vises, of which the following is a specification.

My invention is applicable both to bench-vises for the use of machinists and others and also to drill-vises, whereby work can be clamped readily and held securely while drilling or tapping the same.

The invention relates to that class of vises which comprise a fixed jaw-holder and a movable jaw-holder and a bar secured in fixed position to the fixed jaw-holder. This bar has ratchet teeth or notches, and in the movable jaw-holder is a pawl and a lever. When the lever is moved in one direction or lifted, the pawl is, by cam projections on the lever, disengaged from the ratchet toothed or notched jaw-holder, being slid up to the work, and when said lever is swung downward or moved in the opposite direction the pawl is allowed to come into engagement with the toothed or notched bar, and cam-surfaces upon the lever act upon the movable jaw-holder to force it ahead and toward the fixed jaw. In my improved vise the pawl which engages the toothed or notched bar is not pivoted in the movable jaw-holder, but is pivoted in or carried on a pawl-carrier which slides on the bar, and the operating-lever is also pivoted to this movable pawl-carrier. The operating-lever and the sliding pawl-carrier are accommodated within a notch or mortise in the movable jaw-holder, and in shifting the movable jaw-holder to bring it up to the work all three parts move together as one piece, although by swinging the operating-lever the sliding pawl-carrier and the lever-pivot are held immovable by the engagement of said pawl with the notched bar, while the movable jaw-holder is forced toward the fixed jaw-holder to clamp the work. I also apply a spring between said movable jaw-holder and the pawl-carrier to insure the quick backward movement of the jaw-holder to release the work when the lever is swung into position to release said movable jaw-holder.

The invention will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section of a vise embodying my invention, with the operating-lever swung upward, so as to release the movable jaw. Fig. 2 is a plan of the vise, a portion of the movable jaw-holder being broken away to show the arrangement of the springs between it and the pawl-carrier. Fig. 3 is a sectional elevation of the movable jaw-holder and the base portion on which it slides, the operating-lever being shown as partly swung downward, so as to permit the pawl to come into engagement with the toothed bar and to act upon the movable jaw. Fig. 4 is a rear elevation of the vise; and Fig. 5 is an elevation of the movable jaw-holder and the base portion upon which it slides, being in part a section upon about the plane indicated by the dotted line $x\,x$, Fig. 2, and showing the operating-lever in the position shown in Fig. 1, or swung upward, so as to disengage the pawl from the toothed bar.

Similar letters of reference designate corresponding parts in all the figures.

A designates the fixed jaw-holder, which has a rearwardly-extending arm or base-plate, A′, which forms the stationary bottom of the vise, and this arm or base-plate may be secured to a bench or other suitable support by bolts inserted through lugs or ears a, which are provided upon opposite sides of it, as shown in Fig. 2.

B designates the movable jaw-holder, which slides toward and from the fixed jaw-holder A to grip and release the work.

As here represented, the base portion or extension A′ has dovetailed rails or raised ribs a', with which gibs b upon the movable jaw-holder B engage, as best shown in Fig. 4, and by this construction the movable jaw-holder B is free to slide upon the gibs or ways a' and at the same time is held firmly thereon against any rising movement.

The fixed and movable jaw-holders A B are provided with face-plates or jaws proper, s, which are adapted to clamp upon the work placed between them. These jaws proper or face-plates are or may be provided with cavities c, of spherical or concave form, and may also have V-shaped cavities or indentations c'. These cavities or indentations in the faces of the jaws proper or face-plates s

enable them to securely hold work having rounded surfaces or of other peculiar shapes. I also provide the jaw-holders A B with guards C, which have at the ends rearwardly-projecting ears or lugs c^2, which embrace the jaw-holder, and are pivoted thereto at c^3 by screws or other pins or pivots. The guards C thus supported may, when desired, be swung back away from the faces of the jaws, as shown by dotted lines in Fig. 1, and when swung downward over the faces of the jaws, as shown by full lines in Fig. 1, they serve as rests on which the work will be supported and prevented from dropping downward, while the movable jaw-holder B is forced up to clamp the work.

D designates a bar which is secured at one end rigidly to the fixed jaw-holder A, and passes freely through the mortise b' in the movable jaw-holder B. As here represented, the bar D is inserted between lugs or ears a^2, provided upon the fixed jaw-holder A, and a pin, d, is inserted through these lugs or ears and through the bar D. The bar D is provided upon its under side with a series of fine ratchet-shaped teeth or notches, d', as best shown in Fig. 1.

E designates a pawl-carrier, which slides upon the bar D, and consists of a piece of metal having substantially flat and parallel sides, as shown in Fig. 4. The front end of this pawl-carrier E is closed below the bar by a web, as shown at e; but behind this web the pawl-carrier is open below the bar D, and a cavity is thus afforded for the reception of a pawl, E′, which is movable in the pawl-carrier to engage with or to disengage it from the rack d' upon the under side of the bar D. As here represented, the pawl E′ is pivoted at e' in said pawl-carrier, and is engaged with and disengaged from the bar D by swinging upon this pivot, the amount of its swinging movement being controlled by a pin, e^2, which is fixed in the pawl E′ and works in arc-shaped slots e^3 in the pawl-carrier. When the pawl is not depressed, it is always held in engagement with the rack d' on the bar D by means of a spring, e^4, acting upon the rear side of the pawl, and which is held in position in the pawl-carrier, as by pins e^5 e^6.

F designates an operating lever or handle, which is hollow and open on the under side, as shown best in Fig. 4, but also in Figs. 1 and 3, so that when swung downward it will pass over and inclose the bar D. This lever is mounted upon a pivot-pin, f, which is fast in the pawl-carrier E, and the ends of which project and play in slots b^2 in the movable jaw-holder B. The pivoted end of the lever F is forked or bifurcated, as shown in Figs. 2 and 4, so as to embrace the pawl-carrier E, and both the lever and pawl-carrier are accommodated in a notch or mortise, b^3, in the movable jaw-holder B. Upon the front side of the lever F are cam-shaped surfaces f^2, which, when the lever is swung downward, or in the direction indicated by the arrow in Fig. 5, act upon the front wall of the mortise or notch b^3, and inasmuch as the lever-pivot f is then held by the pawl-carrier and pawl E E′ immovable relatively to the bar D such action of the cam-surfaces f^2 forces the movable jaw-holder B slightly ahead and toward the fixed jaw-holder A. I have here represented the surfaces upon which the cam portions f^2 of the lever F bear as formed by a steel face-plate, f^3, forming the front wall of the notch or mortise b^3, and which may be hardened to resist wear.

As is shown best in Fig. 5, the distance from the center of the lever-pivot f to the front edges of the lever upon the line s' is considerably less than from the center of said pivot to the bottom of the lever upon the line s^2, and therefore it will be understood that the surfaces f^2 are curved or of gradually-increasing radius from the front edges to the bottom of the forked end of the lever and constitute cam-surfaces for acting upon the movable jaw-holder B.

The pin e^2, which is fast in the pawl E′ and plays in the arc-shaped slots e^3 in the pawl-carrier, projects beyond the opposite sides of the pawl-carrier, as shown best in Fig. 4, and upon its ends act cam projections f^4, with which the bifurcated or forked end of the lever is provided, and which are best shown in Fig. 5. When the lever F is swung upward into position to release the movable jaw-holder B, as shown in Figs. 1 and 5, the cam projections f^4 of the lever rise above the pin e^2, as shown in Fig. 5, and by acting upon said pin the pawl E′ is pushed or swung downward, so that its toothed face is disengaged from the bar D, as shown in Fig. 1. When the operating-lever F is swung from its horizontal position, where it has been placed to force the movable jaw-holder B toward the fixed jaw-holder A upward to the position shown in Fig. 3, and then to the extreme upright position shown in Figs. 1 and 5, the cam-surfaces f^2 relax their pressure against the movable jaw-holder B before the cam projections f^4 act upon the pin e^2 to disengage the pawl E′ from the rack d'. It is desirable that as soon as the pressure of the operating-lever F upon the movable jaw-holder B is relaxed said jaw should be retracted slightly to release the work, and this I accomplish by a spring or springs interposed between the movable jaw-holder B and the pawl-carrier E, which by its pawl E′ is locked to the bar D.

As I have before described, the ends of the lever-pivot f project into and play horizontally in recesses or cavities b^2 in the movable jaw-holder B, extending into opposite sides of the mortise or notch b^3. As best shown in Fig. 2, these cavities or recesses b^2 have projecting plates or bearers g projecting across their open ends and secured to the movable jaw-holder B. In the projecting ends of the pin f are cross-pins g', which are guided in

the supports or bearers *g*, and upon which are springs G. It is true that the springs G, which bear at their one end upon the supports or guides *g*, forming parts of the movable jaw-holder B, bear at their opposite ends against the projecting ends of the lever-pivot *f;* but inasmuch as this lever-pivot is fast in the pawl-carrier E, the springs G may be considered as interposed between the movable jaw-holder and said pawl-carrier. As the lever F is swung upward and its cam-surfaces f^2 relaxed through pressure against the movable jaw-holder, the pawl-carrier E is held immovable on the bar D by its pawl E′, and consequently as fast as the pressure of the cam-surfaces f^2 is relaxed upon the movable jaw-holder B said jaw-holder is drawn backward or retracted by the springs G and caused to release the work.

In operating the lever F to grip and release pieces of work of uniform size it is only swung upward to the position shown in Fig. 3, and the pawl E′ is never disengaged from the bar D; but when a piece of work larger or smaller than the previous one is to be received the lever F is swung upward to its extreme position, as shown in Figs. 1, 4, and 5, so that its cam projections f^1 act upon the pin e^2 and disengage the pawl E′ from the bar D. The movable jaw-holder B may then be slid upon the extension or base-piece A′, so as to open the jaws to the desired width.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a vise, of a fixed and a movable jaw-holder, a notched or toothed bar permanently secured to one holder, and on which the other is adjustable, a pawl-carrier independently movable in the movable jaw-holder, having a pawl adapted to engage the notched bar, and a pivoted operating-lever upon the movable jaw-holder, having cam portions which act on the movable jaw-holder when the lever is swung in one direction, and cam-surfaces which act on the pawl to disengage it from the said bar when said lever is swung in the reverse direction, and a spring or springs interposed between the movable jaw-holder and the pawl-carrier, to operate as set forth.

2. The combination, with the movable jaw-holder of a vise and a bar along which said holder is movable, and which has ratchet teeth or notches, of a pawl-carrier sliding on the bar and a pawl movable in said carrier to grip and release the bar, an operating-lever pivoted in said pawl-carrier and having upon it the cams f^2 and f^4, and a spring applied between said jaw-holder and pawl-carrier to insure the quick backward movement of the jaw-holder when said lever is swung into position to release it, substantially as herein described.

3. The combination, with the movable jaw-holder and a toothed or notched gripping-bar, the said holder being notched or mortised at b^3, of the pawl-carrier E, sliding on said bar, and the lever F, straddling the pawl-carrier and pivoted thereto by a pin, *f*, projecting beyond the sides of the lever, both the lever and pawl-carrier being accommodated in the notch or mortise of the jaw-holder, and the lever having the cam portions f^2 f^4, the pawl E′ in the pawl-carrier, and springs G in the holder, acting directly upon the projecting ends of the pin *f*, substantially as herein described.

ERNEST STOECKLIN.

Witnesses:
C. AUGUST SCHOPPER,
FREDERICK MISHAEL.