

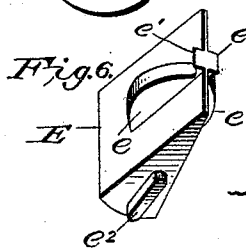
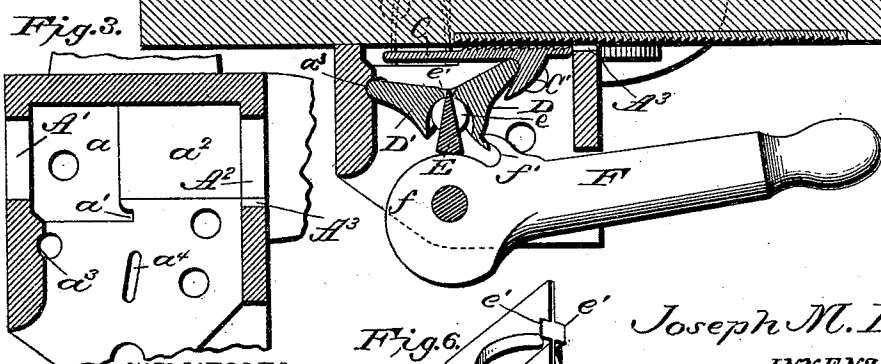
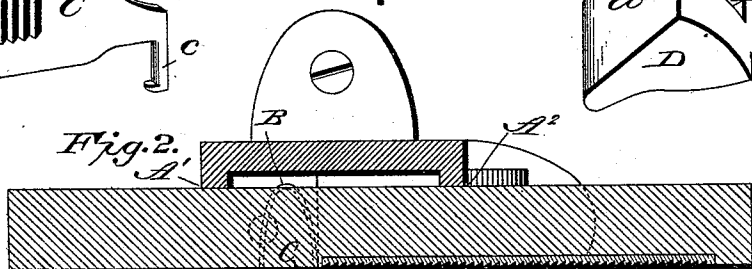
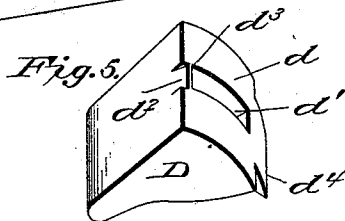
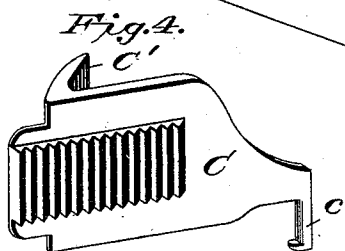
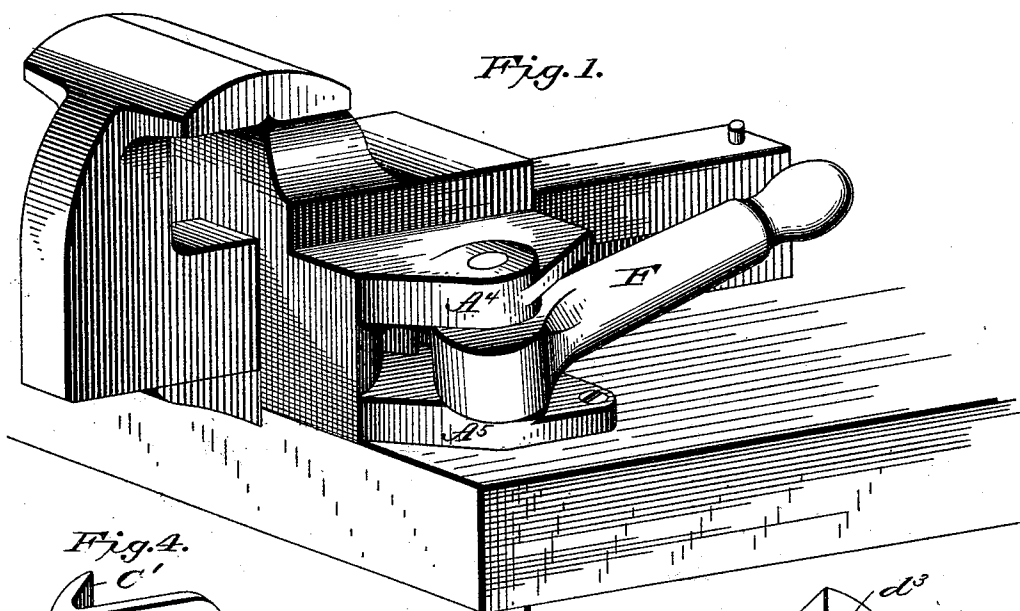
(No Model.)

2 Sheets--Sheet 1.

J. M. LEWIS.
VISE.

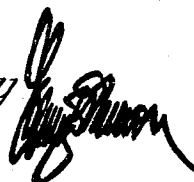
No. 517,347.

Patented Mar. 27, 1894.



Joseph M. Lewis
INVENTOR

WITNESSES
G. S. Elliott,
M. Johnson

by  Attorney

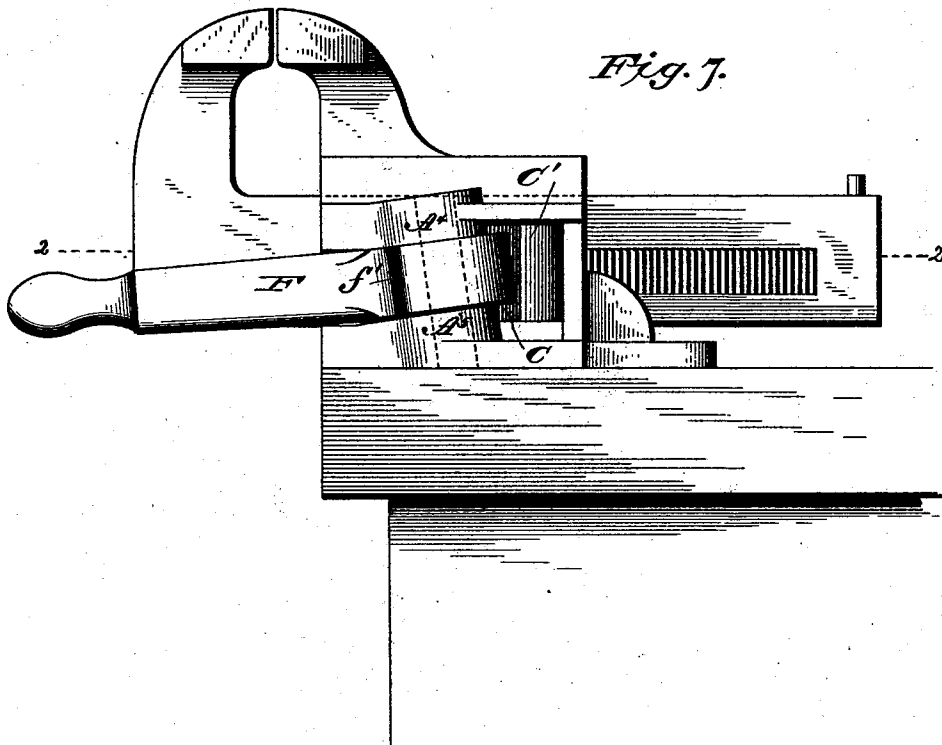
(No Model.)

2 Sheets—Sheet 2.

J. M. LEWIS.
VISE.

No. 517,347.

Patented Mar. 27, 1894.



Joseph M. Lewis

INVENTOR

WITNESSES

G. S. Elliott.
C. M. Johnson

by *C. M. Johnson* Attorney

UNITED STATES PATENT OFFICE.

JOSEPH M. LEWIS, OF TRENTON, NEW JERSEY.

WISE.

SPECIFICATION forming part of Letters Patent No. 517,347, dated March 27, 1894.

Application filed January 6, 1894. Serial No. 495,937. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. LEWIS, a citizen of the United States of America, residing at Trenton, in the county of Mercer and State of New Jersey, 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to provide a vise with mechanism for moving the sliding jaw toward the stationary jaw and locking the same in position so that the work will be held securely between said jaws, the mechanism also serving to project the movable jaw away from the stationary jaw to release the work.

The invention consists in the combination of a slide-bar having rack-teeth and a toothed piece which is spring-actuated and is adapted to engage with the rack-teeth of the slide-bar and with a recess in the slide-box of the vise as well as with the operating mechanism or toggles, so that when the toggles are moved in one direction the toothed piece will be first caused to engage with the rack-teeth of the slide-bar and will afterward be moved into the recess and be thereby held in positive engagement. The construction also provides that when the pressure exerted by the toggles upon the toothed-piece is released said toothed-piece will be caused to move and will carry with it the slide-bar so as to release the work held between the jaws.

The invention further consists in providing inclined bearings for the cam-lever whereby the outer end of the same when in its lowered position will be held by gravity.

The invention further consists in the special construction and combination of the parts, as will be hereinafter fully set forth and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view, showing a vise constructed in accordance with my invention. Fig. 2 is a horizontal sectional view. Fig. 3 is a similar view on the line 2-2 of Fig. 7, with the slide-bar and operating mechanism re-

moved. Figs. 4, 5 and 6 are detail perspective views, and Fig. 7 is a side elevation showing the lever in a position to hold the jaws locked.

A designates the vise-bed which has formed integral therewith the slide-box and the projections between which is pivoted the operating handle or cam-lever. This vise-bed has also the usual stationary jaw formed thereon and projections or brackets which support the slide-bar.

The slide-box is provided with openings A' and A^2 through which passes the slide-bar, and one of the vertical walls of the opening A^2 is cut away to provide a recess A^3 . The bottom of the slide-box has a recess a with an extension a' , and these recesses are of sufficient depth to receive a bowed spring B, one end of which is bent to lie within the extension a' while the other end engages with the depending portion of a toothed-piece C. The bottom of the slide-box is also recessed at a^2 so that the under side of the slide-bar will bear at the lower ends of the openings A' and A^2 .

Openings are provided in the bottom of the slide-box, as shown, which afford ready means for removing any filings or dirt, which may collect in the slide-box, the work bench being cut away beneath the openings, and one of these openings may be adjacent to the inner side of the front wall of the slide-box to provide therein a vertical recess a^3 which forms a bearing for one of the toggle-blocks.

a^4 designates an inclined slot or opening in the bottom of the slide-box with which a guide on a wedge engages.

A^4 and A^5 designate projecting portions formed integral with the slide-box which are provided with inclined bearing-surfaces and with inclined apertures through which passes a pin for pivoting the operating handle or cam-lever. The inclined bearing-surfaces are parallel with each other.

The slide-bar which carries the movable jaw is of the usual construction and is provided with ratchet-teeth as shown, and said slide-bar passes through the openings A' and A^2 in the slide-box and is retained therein by a suitable pin or stop.

C designates a toothed-piece which is provided with a depending portion c with which

one end of the spring B engages, and the toothed-piece is reduced at the end opposite the depending portion so that said reduced end can pass into the recess A³ in the side wall of the opening A². The side of the toothed-piece opposite the teeth is provided with a hook, C'.

D and D' designate toggle-blocks which have curved faces *d* and recesses *d'* and *d*² which are separated by a wall *d*³. These toggle-blocks are similar in construction with the exception that the one D has an extension or hook *d*⁴. The toggle-block D' has a bearing in the recess *a*³ formed in the front wall of the slide-box, and the other toggle-block bears against the hook C' of the toothed piece, and between the curved or adjoining faces of the toggle-blocks is placed a wedge E, said wedge having projecting flanges *e e* which enter the recesses *d'* of the toggle-blocks, and on a line with these flanges the pointed end of the wedge has projections *e'* which serve to retain the wedge between the toggle-blocks. The walls *d*³ of the toggle-blocks bearing against the wedge serve to cause the parts to move in unison. The wedge is also provided with a projecting lug *e*² which enters the inclined slot or recess *a*⁴ in the bottom of the slide-box.

F designates the operating lever which is provided with a cam-shaped end *f* and a projecting-portion *f'*. This lever is pivoted between the projections A⁴ and A⁵ and is retained in position by the pivot-pin which passes through the inclined apertures in the projections. By providing the lever with the inclined bearing-surfaces when it is moved to one side to unlock the vise the handle will be elevated so as to provide ample room beneath the handle so that the hand or fingers of the operator will not strike against the table, and when moved in the opposite direction, or in a position to lock the vise, the handle being at its lowest point the weight thereof will prevent the same raising by any jar on the vise, and any jar or hammering on the vise will tend to move the handle so as to cause it to exert a greater pressure upon the locking mechanism than otherwise.

In operation, when the handle or lever is thrown to the position shown in Figs. 1 and 2, the reduced portion of the cam end of the lever will permit the toothed-piece to be moved by the spring to rock the toggle blocks and disengage the said toothed-piece from the aperture A³ in the slide-box, and by causing the engagement of the projection *f'* of the lever with the projection on the toggle-block D the toothed-piece will be farther moved to hold the same away from the slide-bar, as shown. When the parts are thus positioned the slide-bar can have a perfectly free movement within the slide-box and can be readily adjusted to approximate the distance between the jaws to suit the work to be clamped. When the lever is moved on its pivot so as to disengage the projection *f'* from the projection on the toggle-block D the toothed-piece

will immediately engage with the rack-teeth on the slide-bar so that the slide-bar can be moved to bring the movable jaw toward the stationary jaw, the teeth sliding over each other and being kept in engagement by the spring. The work is placed between the jaws and held between them by moving the movable jaw, and by moving the lever the cam-face thereof bearing upon the wedge will tend to move the toggle-blocks on a line which will cause the toothed-piece to engage the slide-bar and move the same to firmly clamp the work, the projecting end of the toothed-piece moving into the recess A³ holding the rack-teeth of the toothed-piece and slide-bar in positive engagement. The handle when turned to lock the work in the vise will assume its lowest position and will be retained by gravity. When it is desired to release the work from between the jaws the handle is turned upon its pivot releasing the pressure upon the end of the wedge E and the spring drawing upon the toothed-piece C will move the slide-bar with said toothed-piece until the projecting end of said toothed-piece is free of the recess A³; this releases the work, and when the lever reaches its movement where the projection *f'* engages the projection on the toggle-block D the toothed-piece will be drawn entirely out of engagement with the teeth on the slide-bar.

The wedge and toggles combined with the cam-end of the lever form a very powerful leverage so that a great amount of pressure can be exerted upon the work in drawing the jaws toward each other, and the parts are so constructed that the spring not only acts upon the toothed-piece but also through the same upon the toggles and wedge, so that the wedge is held in contact with the cam face of the lever. It will also be noted that when the projecting end of the toothed-piece is in the recess A³ the slide-bar and toothed-piece will move together as one piece.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a vise constructed substantially as shown, a lever having a cam-end for operating the locking and unlocking mechanism, said lever being pivoted upon an inclined pin, for the purpose set forth.

2. In a vise constructed substantially as shown, a slide box having projections with inclined bearing surfaces and apertures at right angles with said bearing surfaces through which passes a pin upon which is mounted the operating lever, substantially as shown and for the purpose set forth.

3. In a vise constructed substantially as shown, the combination, of a toothed-piece having rack-teeth, means for causing the engagement of said teeth with the teeth of the slide-bar of the vise and impart thereto a lateral movement, whereby the toothed-piece is moved between the slide-bar and the rigid frame of the vise, for the purpose set forth.

4. In a vise, the combination, of a slide-box having openings through which the slide-bar passes, one of the walls of one of the openings being cut away to provide a recess, of a toothed-piece and actuating means adapted to move said toothed-piece in engagement with the teeth on the slide-bar and into the recess, substantially as shown and for the purpose set forth.

5. In a vise, the combination, of a slide-box having openings A' and A^2 , one wall of the opening A^2 being cut away to form a recess A^3 , of a slide-bar having ratchet-teeth and a toothed-piece having a projecting portion which is adapted to enter the recess A^3 , said toothed-piece being spring-actuated in one direction, and toggles for moving the toothed-piece against the action of the spring and in engagement with the recess and ratchet-teeth on the slide-bar, substantially as set forth.

6. In a vise, a slide-box constructed substantially as shown and provided with a recess a having an extension a' , a bowed spring located within said recesses, said spring having a bent end, in combination with a toothed-piece C having a depending-portion which enters the recess a and engages with the spring, and means for operating the toothed-piece, substantially as shown and for the purpose set forth.

7. In a vise, the combination, of the toggle-blocks D and D' having recesses d' , of a wedge having laterally-projecting flanges which enter said recesses, the toggle-blocks being adapted to engage with a toothed-piece having a hook, and a cam-lever, substantially as shown and for the purpose set forth.

8. In a vise, the combination, of a slide-box

having a spring-receiving recess a and a notch or recess a^3 forming a bearing for a toggle-block, a slide-bar provided with ratchet-teeth, a toothed-piece which is adapted to engage with a spring located within the recess a , with the ratchet-teeth of the slide-bar and with toggle mechanism which is actuated in one direction by the hereinbefore mentioned spring and in the other direction by a cam-lever, the parts being organized substantially as shown and for the purpose set forth.

9. In a vise constructed substantially as shown, and provided with a pivoted lever having a cam-shaped end the combination, with a slide-bar and toothed-piece, of the toggle-blocks D and D' having recesses d' , and an interposed wedge E having flanges $e e$ which engage the recesses d' in the toggle-blocks, the toggle mechanism being actuated in one direction by a cam formed on the handle or lever F .

10. In a vise, the combination, of a slide-box constructed substantially as shown, a slide-bar, a toothed-piece spring-actuated in one direction and provided with a hook C' , of the toggle-blocks D and D' having recesses d' , a wedge having flanges which enter said recesses and a projection which enters a slot in the bottom of the slide-box, and a lever which is adapted to engage with the wide end of the wedge, substantially as shown and for the purpose set forth.

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

JOSEPH M. LEWIS.

Witnesses:

FRANK W. THURMAN,
CONRAD B. BENNETT.