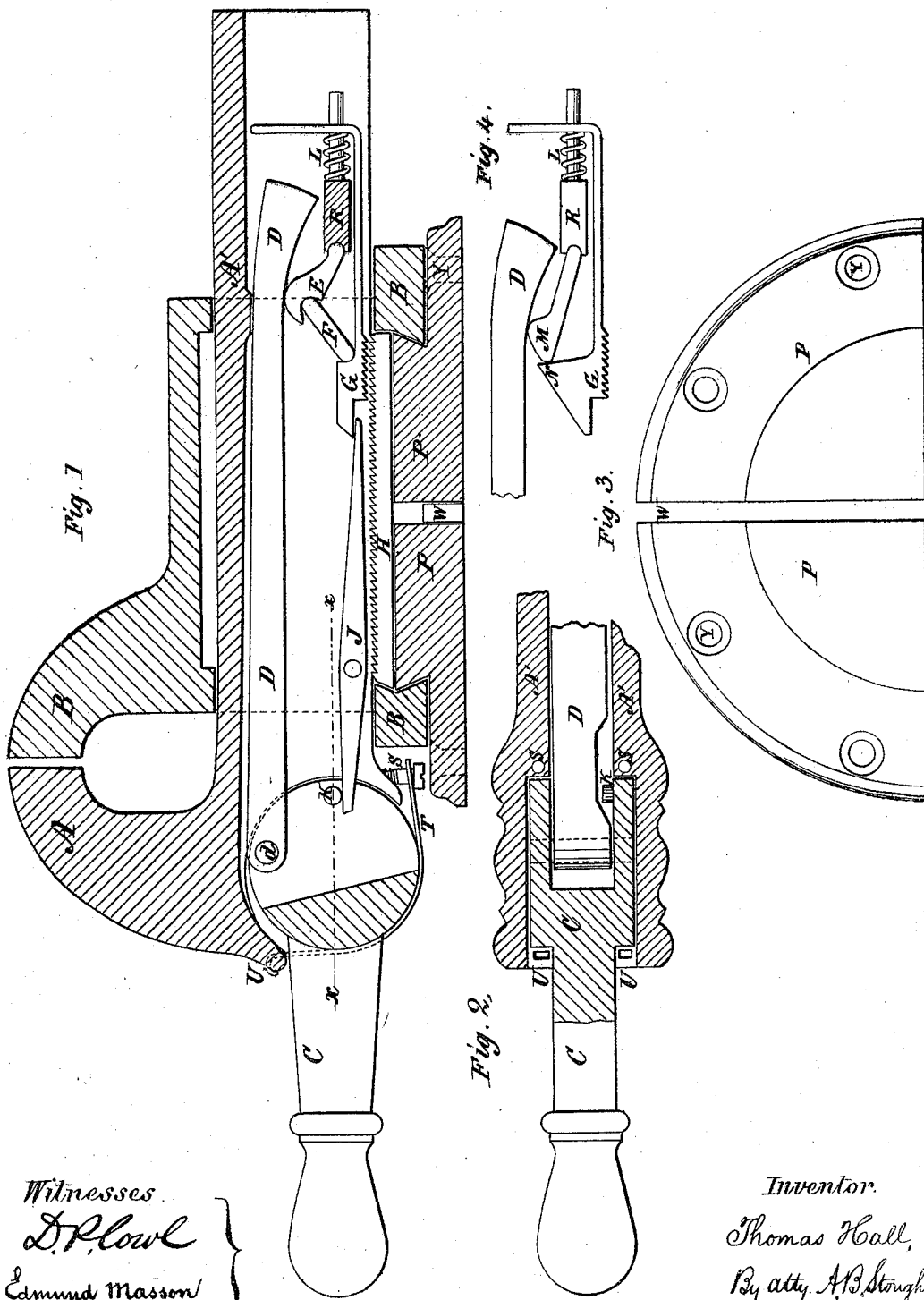


T. HALL.

Vises.

No. 140,269.

Patented June 24, 1873.



Witnesses  
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# UNITED STATES PATENT OFFICE.

THOMAS HALL, OF FLORENCE, MASSACHUSETTS.

## IMPROVEMENT IN VISES.

Specification forming part of Letters Patent No. **140,269**, dated June 24, 1873; application filed March 24, 1873.

### *To all whom it may concern:*

Be it known that I, THOMAS HALL, of Florence, town of Northampton, county of Hampshire, State of Massachusetts, have invented a new Mechanical Device for a Bench Vise or Clamp, of which the following is a specification:

This invention is a new form and construction of vise possessing important advantages in the convenience and quickness with which it can be handled.

One of the chief features of this vise is the position and operation of the handle in relation and in connection with the movable jaw of the vise, whereby new and important results are attained, the handle being attached to the vise differently from that of any other vise, and the method of applying friction to the handle to hold it where placed. Another peculiarity is the form of swivel, by which the vise is attached to the work-bench, and the method by which the vise can be turned on said swivel, or held firmly in place by the action of the same mechanism that operates the jaws of the vise. Another new feature is applying force to the jaws by pressure against an abutment in the hollow sliding bar, which is part of the movable jaw.

Figure 1 is a vertical section of the device from end to end, showing all its parts. Fig. 2 is a horizontal section (from beneath) through line from *x* to *x* in Fig. 1. Fig. 3 is one-half of base-plate cut through the middle. Fig. 4 is a section, showing a substitute for the toggle in Fig. 1.

The jaw A and sliding bar A' are cast in one piece, hollow from the under side to contain the working-parts of the vise. B is the stationary jaw, cast so that the sliding bar A' will fit into it, and with a portion constituting the base to fit to the swivel-plate P. C is a handle or lever having two disk-like portions to fit into recess or recesses in the under part of jaw A, and having bearing or frictional surfaces around the peripheries of the disks. T is a band or strap, shown in position in Fig. 1. The places to attach a band on each side of handle are shown at U U in Fig. 2. The straps are used to retain the handle in the recess in movable jaw, and to apply friction to hold it wherever placed. S is a screw passing

through the free end of strap T into a hole in side of sliding bar to adjust the tightness of straps. S S, in Fig. 2, show holes for screws for both straps. D is a wedge pivoted between the disks of handle C, to move, by the action of said handle, between the top of recess in sliding bar and the toggle, or other device for operating on the clutch. E F are the two members of toggle operated by wedge D. In Fig. 4, M represents a wedge, which can be used as a substitute for the toggle to force clutch G from abutment R by its action against the nearly perpendicular surface on piece G. G is a clutch with teeth on lower side to interlock with the teeth on the bar H. A portion of the piece G turns up back of abutment R. L is a spring placed between the abutment R and the upward-bent portion of G. A pin through the spring keeps it in place. Its use is to draw clutch G back when the pressure is removed. H is a toothed bar laid into the stationary jaw B, into which the clutch G interlocks to close the jaws of the vise. When the swivel-plate is used the forward end of H is beveled to fit a corresponding surface in jaw B, so that a pressure forward on H will bind stationary jaw to swivel-plate H, resting on the surface of plate P. J is a lever pivoted between the sides of sliding bar, acted upon by a projection, K, on disk of C, to raise the clutch G from contact with toothed bar H. R is a part of the same casting with the jaw A formed across from one side to the other of sliding bar A', a solid abutment against which the force to clamp the vise is exerted being a simple and substantial mode of structure. P P, Fig. 1 and Fig. 3, is a plate with circular projection of dovetailed form, which fits into circular recess of corresponding form in the base of stationary jaw B. The plate is cut into two or more sections in order to get it into the recess, and so that the sections can be forced apart to make more or less friction against its bearing-surface in jaw B. The plate P can be fastened to table or work-bench by any suitable device, such as screws, bolts, or clamp. W represents a space between the sections of base-plate, in which a wedge can be inserted to adjust the plate to stationary jaw B.

The operation of a vise of this construction is as follows: When the handle is at its high-

est point, or in line with the sliding bar A', the pin or projection K, acting on lever J, lifts the clutch G from the rack or toothed bar H. The jaw A can then be moved freely to or from the stationary jaw, the parts being then in a position as shown in Fig. 1, and the whole vise is free to move on the swivel-plate, and can be handled most conveniently by the handle C which is fixed to the movable jaw, to place it at any angle with the work-bench, or take hold of any sized piece between the jaws.

When anything is to be held, it is placed against the jaw B and the jaw A pushed against it by taking hold of the handle C; then by pressing downward on the handle, the long end of the lever J is lowered, letting G down so that the teeth interlock or mesh with the teeth on bar H, and the wedge is drawn forward between the top of sliding bar and the toggle E F, straightening the toggle and forcing the clutch G and the abutment R apart with great power, thus drawing the jaws powerfully together. At the same time the toothed bar H is pressed downward on plate P, and the beveled front end pressed against the corresponding bevel on the inside of B, thereby binding the beveled circle of B strongly to the beveled face of the base-plate P, and holding the vise firmly in the position it is placed in before the power is applied to it.

A plan for substituting in place of the toggle mechanism shown in Fig. 1 is shown in Fig. 4. Equivalent methods are applicable to serve the same purpose as the toggle—that is, communicating the power applied to the handle to force the jaws together.

The position of the handle and its mode of action are peculiar and valuable features in this vise, being fixed to the movable jaw to control it, so that by one movement of the handle the jaws are released from a grip and opened to any desired extent; by a movement in an opposite direction the jaws are closed and firmly held together, the handle being in the best position when horizontal for moving the jaw or turning the vise on its swivel, and for applying a downward pressure to

clamp, and when closed the handle is downward, so as not to interfere or be inconvenient while anything is held in the vise. The plan of swivel used with this vise is new, and is applicable to vises of other forms and construction. For instance, it can be applied to a vise which is operated by a screw by placing a nut on the bar H. The forward pressure on the nut would cause the bar to act on the swivel as it does in this case. The swivel can also be operated entirely independent of the action of the jaws by tightening the wedge. The plate will bind on the base of the jaw B so as to be practically fixed and stationary. The form of the wedge is not important. It may be a taper screw or cam, or the relation of the dove-tail parts may be reversed, and the projecting portion be on the base of the jaw, and fitted into a recess in the base-plate, without affecting the novel elements of the invention.

What I claim is—

1. In combination with the movable jaw A of the vise the handle c, attached thereto by frictional bearings or straps T, for the purpose of holding said handle in any of its working-positions, substantially as and for the purpose described.

2. The combination of handle C, movable jaw A, and clutch G with wedge D, and toggle E F, or their equivalents, and rack H and stationary jaw B, substantially as described, for purposes named.

3. The combination of the projection K on lever C, lever J or its equivalent, with clutch G and rack H, substantially as described.

4. The combination of the dovetailed ring or flange B on the vise, with the sectional dovetailed bed-plate P, as and for the purpose described and represented.

5. The combination of the ring or flange B, bed-plate P, and notched bar H, as and for the purpose described and represented.

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Witnesses:

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