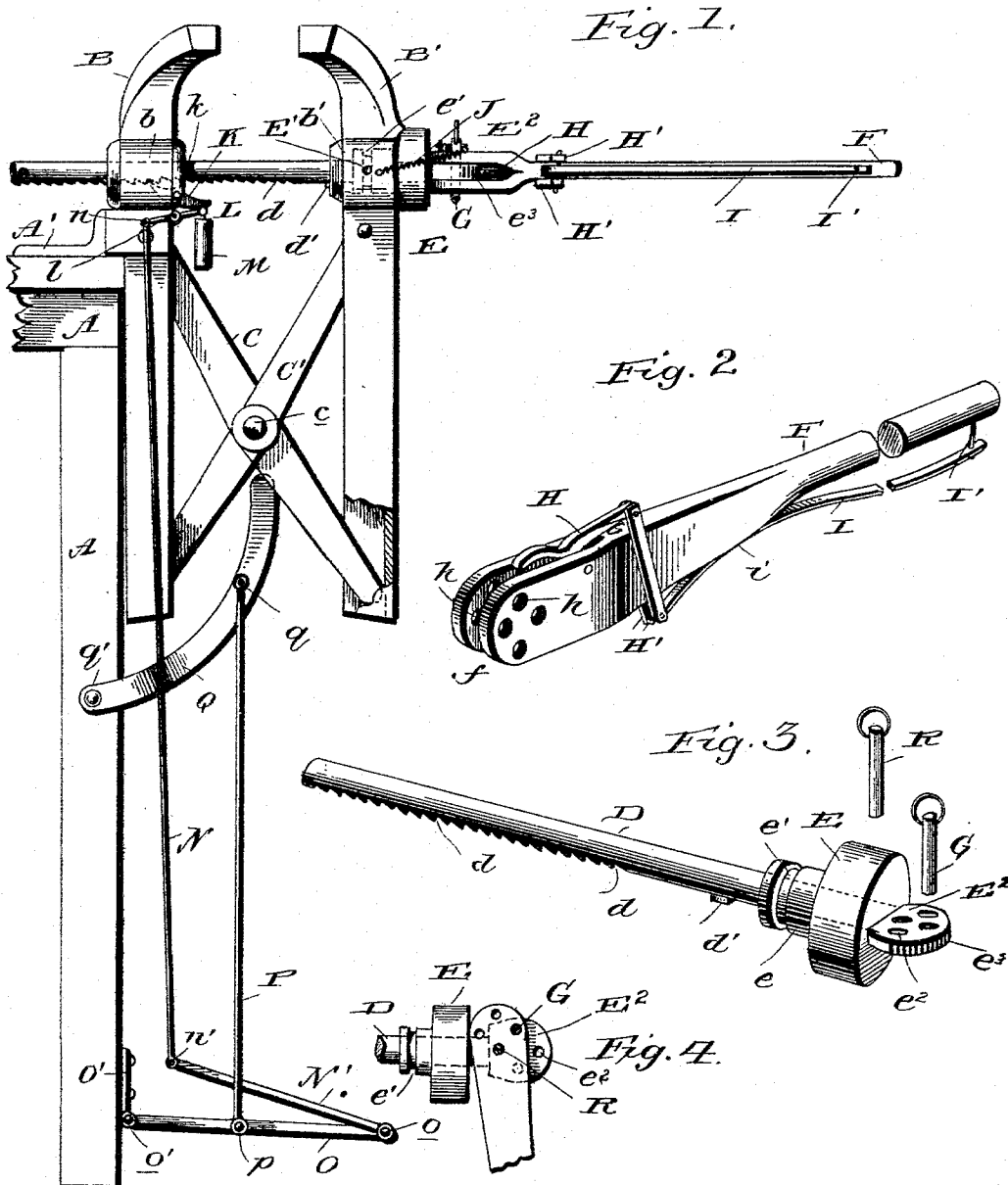


(No Model.)

S. O. ROOT.
VISE.

No. 533,496.

Patented Feb. 5, 1895.



Witnesses:
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UNITED STATES PATENT OFFICE.

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WISE.

SPECIFICATION forming part of Letters Patent No. 533,496, dated February 5, 1895.

Application filed June 4, 1894. Serial No. 513,406. (No model.)

To all whom it may concern:

Be it known that I, SANFORD O. ROOT, a citizen of the United States, residing at Lodi, in the county of Seneca, State of New York, have invented certain new and useful Improvements in Vises, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in vises and it has for its objects among others to provide a simple, cheap, durable and efficient vise with the parts so constructed and arranged that by a single motion of the operating lever the jaws will be moved a considerable distance, and the maximum amount of power can be most economically used, the minimum amount being ample for ordinary purposes. The jaws are connected by toggle levers and through the jaws passes a rod which is provided with teeth for the engagement of a retaining pawl and on this rod is a revoluble collar against which works a cam lever mounted adjustably on an extension of the said rod beyond the revoluble collar, this extension having a ratchet with which engages a pawl mounted on the cam lever. Means are provided for disengaging the pawl from the teeth of the rod and for opening or spreading the jaws, said means being connected to be actuated together, first to disengage the pawl and then to separate the jaws.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be specifically defined by the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation of my improvements with the jaws separated. Fig. 2 is a perspective view of the cam lever with its pawl and pawl-operating mechanism. Fig. 3 is a perspective view of the ratchet rod and its revoluble collar, with the pins removed. Fig. 4 is a detail showing the parts in position with the removable pin inserted to prevent retrograde movement of the lever on its pivot.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the bench or other support to which the vise is attached, one of the jaws being provided with a bracket or lug A' for its attachment thereto as shown in Fig. 1.

B and B' are the jaws of the vise. They are each formed with a tubular enlargement *b* and *b'* respectively through which works the ratchet rod. The jaw B, I will term the fixed jaw and the jaw B' the movable jaw. The jaws are connected by the crossed arms C and C' the upper ends of which are pivotally attached to the shanks of the jaws as shown in Fig. 1 and the arms are pivoted together at their point of intersection on a suitable pivot *c*.

D is the ratchet rod. It is provided upon its under face for a portion of its length with teeth as shown at *d* and near its outer end with a lug *d'* which fits in a recess in the boss or enlargement of the jaw B' as shown in Fig. 1 to prevent turning of the rod. This rod passes through the hub *e* of a collar E which hub is provided with an annular groove *e'* into which extends a pin or screw E' held in the enlargement of the jaw B' to permit of rotary movement of the collar and yet prevent endwise movement thereof. The outer end of this rod carries an extension E² in the form of a flat plate provided with a plurality of vertical openings *e*² and having its outer edge toothed as shown at *e*³ to form a ratchet as seen best in Fig. 3.

F is the operating cam lever. It is bifurcated at one end as shown best in Fig. 2 the bifurcations embracing the extension E² of the ratchet rod and being provided with a plurality of openings *f* the lever being pivoted on the said extension by means of a removable pivot pin G which may be inserted in any of the holes to change the leverage and increase the cam surface, the cam portions of the lever acting against the outer face of the collar as shown in Fig. 1.

H is a pawl pivoted on a pivot *h* held in the bifurcated end of the lever and working therebetween as shown to engage the ratchet on

the extension E². This pawl is connected at its outer end to the rods or links H' to the other end of which is connected one end of the flat spring I which lies along the handle 5 of the lever as shown, being bent at i to have a bearing against the lever and its other end being provided with an opening through which passes the pin or stud I' on the lever 10 to prevent movement of the spring toward the outer end of the handle.

J is a coiled spring which passes around the coupling pin G, with one end attached to the enlargement of the jaw B' as shown in Fig. 1 and its other end attached upon the opposite 15 side serves to hold the head of the ratchet rod against the head block or collar through which said rod passes and materially aids in the manipulation of the vise.

K is a pawl pivoted at k on the enlargement 20 of the jaw B as shown in Fig. 1 in position to engage the teeth of the under side of the ratchet rod.

L is a lever pivoted at l on the shank of the jaw, or some other fixed part, with one end 25 arranged under the tail of the pawl and to this end of the lever is connected a weight M and to the other end is pivotally attached as at n the vertical rod N, the other end of which is pivotally connected as at n' with the foot lever N' which in turn is pivotally connected 30 as at o with the foot treadle O the inner end of which is pivotally supported as at o' from a bracket O' attached to the bench or support A.

The treadle O has pivotally connected therewith between its ends as at p one end of the vertical connecting rod P the upper end of which is pivotally connected as at q with the curved arm or lever Q one end of which is 40 pivotally supported as at q' from the bench or other support while its other end presses against one of the arms C so that slight pressure upon the foot treadle will open the jaws, after the pawl has been disengaged from the 45 teeth of the ratchet rod.

With the parts constructed and arranged substantially as above set forth the operation will be readily understood.

The jaws having been forced together to 50 clamp whatever is placed between them the lever is held in its position by a removable pin R which is inserted through the proper openings as shown in Fig. 4 to prevent retrograde movement of the lever on its pivot. 55 When it is desired to open the jaws the foot is placed upon the foot lever N' and the latter pressed downward. This disengages the pawl K from the teeth of the ratchet rod, when continued downward pressure will operate the curved lever Q to spread the jaws. 60

Modifications in detail may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as new is—

65 1. The combination with the ratchet rod and the jaws, of a pawl mounted to engage

the ratchet rod, a collar revolubly mounted on the rod, and a cam lever acting upon said collar, as set forth.

2. The combination with the jaws and the 70 ratchet rod having an extension with openings and ratchet, of the pawl mounted on one of the jaws to engage the ratchet rod, the cam lever mounted to act upon the rod, and a pawl mounted on the lever to engage the ratchet 75 on the extension of the rod, substantially as specified.

3. The combination with the jaws, of the crossed pivoted arms pivotally connected with said jaws, the ratchet rod and its pawl, and 80 the curved lever acting to spread the jaws, as set forth.

4. The combination with the jaws and their pivoted crossed connecting arms, of the curved lever, and the foot lever connected therewith 85 to spread the jaws, as set forth.

5. The combination with the jaws and the ratchet rod and its pawl, of the crossed pivoted arms connecting the jaws, the curved pivoted lever acting to spread the jaws, the foot lever, 90 the foot treadle and connections between the same and the pawl and curved lever, as set forth.

6. The combination with the jaws and the ratchet rod, of the collar revolubly mounted 95 on the rod, the cam lever, pivotally mounted on the end of the said rod and the spring, carried by the said lever substantially as specified.

7. The combination of the jaws, the ratchet 100 rod, its pawl, the cam lever pivoted adjustably on the head of the rod, the pawl on the lever, the spring on the lever and connections between said lever and the pawl on the lever, 105 substantially as specified.

8. The combination of the jaws, the ratchet rod, its pawl, the crossed arms connecting the jaws, the pivoted curved lever for spreading the jaws, the foot lever connected with a lever 110 acting on said pawl, and a treadle pivotally connected with the curved lever, substantially as specified.

9. The combination of the jaws, their pivoted crossed connecting arms, the ratchet rod with head with ratchet and openings, the collar revolubly mounted on the ratchet rod, the cam lever adjustably mounted on said head, the pawl on the lever engaging the ratchet on the head, the spring and connections between 115 the same and the lever-pawl, the pawl acting on the ratchet rod, the curved lever engaging one of the crossed arms, the foot lever, the treadle and connections between the foot lever and treadle and the ratchet-pawl and curved lever, substantially as specified. 125

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

SANFORD O. ROOT.

Witnesses:

GILBERT TOWNSEND,
D. WOODWORTH TOWNSEND.