





# United States Patent Office.

O. H. GARDNER, OF FULTON, NEW YORK.

Letters Patent No. 96,580, dated November 9, 1869; antedated November 1, 1869.

## IMPROVEMENT IN VISES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, O. H. GARDNER, of Fulton, in the county of Oswego, and State of New York, have invented a new and improved Bench-Vise; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

Figure 1 represents a side elevation, partly in section, of my improved bench-vise.

Figure 2 is a horizontal section of the same, the plane of section being indicated by the line *z z*, fig. 1.

Figure 3 is a detail vertical section of the same, taken on the plane of the line *y y*, fig. 1.

Figure 4 is a detail vertical section of the same, taken on the plane of the line *z z*, fig. 1.

Similar letters of reference indicate corresponding parts.

This invention relates to certain improvements on the bench-vise for which Letters Patent, No. 80,722, were granted to me on the 4th day of August, 1868.

The present invention has for its object to make the vise therein described more practicable and of greater effectiveness.

The invention consists, first, in so shaping the shank of the rear jaw that its lower pivot is in line with the centre of the upper clamping-plate, so that the said jaw will work on a centre, and will not be thrown off the bench.

The invention also consists in so shaping the shank of the front jaw that the centre of its ball will be in line with the face of jaw, for the purpose of obtaining greater accuracy of motion during the setting of the front jaw, for holding tapering articles.

The invention consists, thirdly, in forming a tapering aperture through the front jaw, for the purpose of allowing the long nut holding the clamp-screw to play freely in the front jaw, when the latter is set for a taper or longitudinally.

The invention consists, fourthly, in forming a prolonged hub or boss on the inner side of the front jaw, with its end in line with the face of the jaw, for the purpose of holding the front jaw true with the rear jaw in every position.

The invention finally consists in forming a rib on the shank of the rear jaw, playing in a notch of the plate on the bench, for the purpose of forming a reliable guide when the rear jaw is swung horizontally on the bench.

A, in the drawing, represents the bench.

B, the rear jaw, with its shank *b'* resting on the socket C.

D is the semicircular plate, attached to the shank of the rear jaw, and connected by the screw F, or its

equivalent, with the plate E on the bench, all as described in the aforesaid Letters Patent.

G is the front jaw, having the grooved ball H, on the lower end of its shank *g'*, the said ball resting in a socket of the slide-bar I, and connected with the spring J, as also substantially set forth in the said Letters Patent.

K is the pawl, arranged on the rear shank *b'*, to hold the slide-bar I, the said slide-bar resting on the arm *b<sup>2</sup>* of the shank *b'*.

L is the clamping-screw, M the long nut, and N the saddle-washer, described in the said Letters Patent.

O is the sliding dog on the front shank, to lock the same to the slide-bar; and

P, the spring on the dog, for holding the same out of the way of the slide-bar, when the jaws are to be set on a taper.

On the shank *b'* is formed an offset, *c*, whereby its lower end is brought perpendicularly in line with the centre of the plates D E. The motion of the rear jaw is thereby made steady when the same is being swung on the bench.

On the shank *b'* is also formed, opposite to the plate E, a rib, *d*, having a semicircular outer surface, as shown in fig. 2, and fitting into a notch or groove of the plate E.

The curve of the rib *d* is concentric with the track of the plate D, so that it will not be strained nor strain when the rear jaw is swung on the bench.

On the front shank *g'* is also formed an offset, *e*, whereby the ball H is brought perpendicularly below the face of the jaw G, to make the horizontal motion of said jaw simple, steady, and reliable.

The aperture *h*, through the shank of the front jaw, for receiving the long nut, is made tapering, to be larger on the outer side, as shown in figs. 1 and 2. Thereby the jaw is allowed freedom of motion in a horizontal as well as vertical direction, without binding on the long nut or on the clamp-screw L.

On the shank *g'* is, where the long nut passes through it, formed a prolonged hub or boss, *i*, whose inner end is in line with the face of the jaw G, for the purpose of holding said jaw true to the rear jaw in any desired position.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. The offset *c*, formed on the rear shank *b'*, for the purpose of carrying its lower end perpendicularly in line with the centre of the upper plate D, substantially as herein shown and described.

2. The offset *e*, formed on the shank *g'* of the front jaw, to carry the ball H perpendicularly in line with the face of the jaw, substantially as and for the purpose herein shown and described.

3. Making the aperture  $h$  through the shank  $g'$  of the front jaw of tapering form, for the purpose of giving greater freedom of motion to the said jaw, as set forth.

4. The prolonged hub  $i$ , formed on the shank of the front jaw, for the purpose and in the manner substantially as herein shown and described.

5. The rib  $d$ , formed on the rear shank  $b^1$ , to work

in or against the plate E, substantially as and for the purpose herein shown and described.

The above specification of my invention signed by me, this 8th day of February, 1869.

O. H. GARDNER.

Witnesses:

H. C. HOWE,  
ARVIN RICE, Jr.