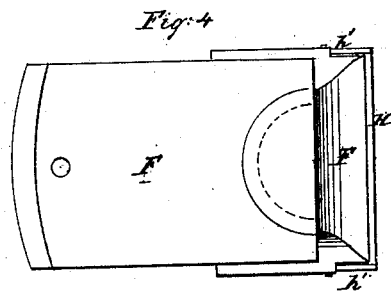
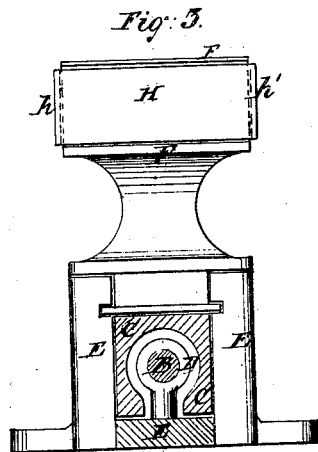
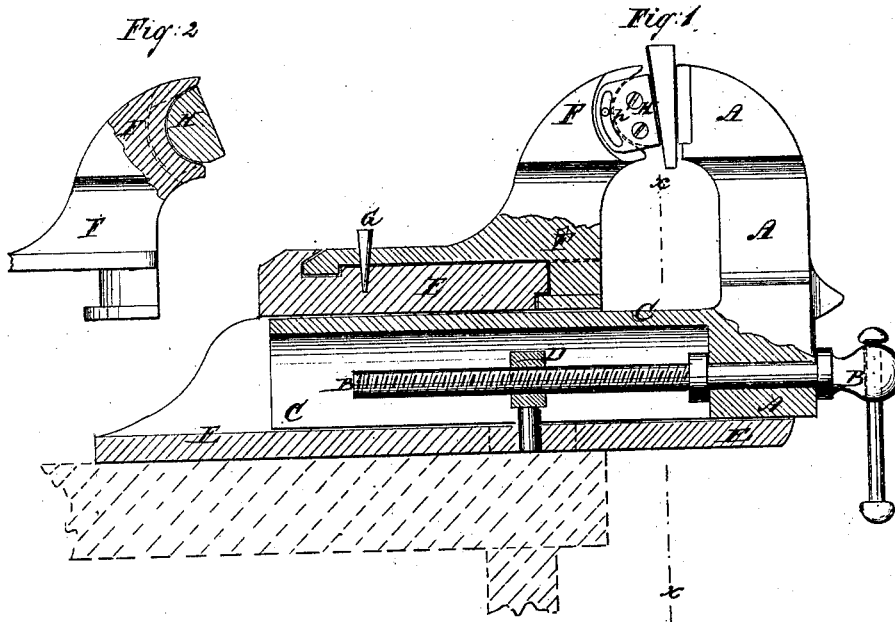


*W. P. Harwood,*

*Vise.*

*No. 113656.*

*Patented Apr. 11. 1871.*



Witnesses:

*E. Praetig.*  
*L. S. Baber*

Inventor:

*W. P. Harwood*  
PER *Wm. H. S.*  
Attorneys.

# United States Patent Office.

WILLIAM P. HARWOOD, OF CAMBRIDGE, NEW YORK, ASSIGNOR TO JAMES F. HALL AND JOHN L. MARSHALL, OF SAME PLACE.

Letters Patent No. 113,656, dated April 11, 1871.

## 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, WILLIAM P. HARWOOD, of Cambridge, in the county of Washington and State of New York, have invented a new and useful Improvement in 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 drawing forming part of this specification, in which—

Figure 1 is a side view of my improved vise, partly in section, to show the construction.

Figure 2 is a detail sectional view of the rear jaw.

Figure 3 is a vertical section of the same taken through the line  $x\ x$ , fig. 1, and showing a face view of the rear jaw.

Figure 4 is a bottom view of the jaw.

Similar letters of reference indicate corresponding parts.

This invention relates to an improved construction of vise for holding tapering articles; and

It consists in forming a recess or semi-cylindrical groove across the face of each jaw of the vise and in fitting therein a movable piece which is of the form of a longitudinal half section of a solid cylinder, the same being provided with slotted ears to adapt it to be held securely in place by means of pins projecting from each end of the jaw, as hereinafter described.

Hitherto the construction of vises of this class has been objectionable in view of the fact that the movable piece has been so connected with the jaws of the same as to allow chips and filings to fall into or accumulate in the space or wedge-like cavity on the upper side of the jaws; hence, interruption of the operation of the vise and inefficiency of the same for its intended function have resulted. I remedy these objections and also increase the strength, while lessening the cost of the vise, by the construction hereinafter set forth.

In the drawing—

A indicates the front jaw of the vise.

B, a screw for moving the same, and which is swivelled in the nut D attached to the block E.

The arm C is formed solid with the jaw A, and extends through a square hole in the block E. On the upper side of this block is formed a seat to receive the base-plate of the rear jaw F.

The rear edge of the base-plate of the jaw F is curved upon the arc of a circle, and has a flange formed upon it which enters a recess or groove formed in the top of the block E, and thus serves as a guide, support, and brace to the jaw F.

Upon the lower end of the jaw F is formed a semi-cylindrical projection, provided with a flange upon its lower end, which enters and fits into a recess formed upon the forward side of the upper part of the block E, and which pivots the jaw F to the block E so that the jaw F may turn horizontally to adjust itself to a tapering article to be held horizontally.

The jaw F is secured in a position parallel with the jaw A by a pin, G, passing through a hole in the base-plate of the said jaw F and into a hole in the block E.

In the face of one of the jaws, as F, is formed a semi-cylindrical recess, in which is placed a semi-cylindrical piece, H, to the ends of which are attached or upon them are formed plates or flanges, which enter and work in recesses formed in the ends of the jaw F.

The movements of the piece H are limited and guided by pins or projections attached to or formed upon the ends of the jaw F, and which enter curved slots in the flanges or plates  $h'$ , as shown in fig. 1. By this means the piece H can adjust itself to the taper of an article to be held vertically. The piece H will also adjust itself to hold articles with parallel sides, holding them as firmly as a vise with solid jaws would hold them.

It will be observed that the semi-cylindrical piece H is so nicely fitted in the recess of the jaws (as properly illustrated in fig. 2) that if chips, filings, &c., fall upon the upper side of the piece H they will find no entrance between it and the jaw.

Having thus described my invention,

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

The semi-cylindrical piece H, fitted in the groove or recess in the face of the jaw F, and held therein by its slotted ears  $h'$  and pins or projections on the jaw, as shown and described.

WILLIAM P. HARWOOD.

Witnesses:

J. N. HODGE,

J. C. HARRIS.