



# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN VISES.

Specification forming part of Letters Patent No. **175,863**, dated April 11, 1876; application filed December 6, 1875.

*To all whom it may concern:*

Be it known that I, WILLIAM E. KRAMAR, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Vises, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention consists of an intermediate adjustable jaw, in combination with the fixed jaw of a vise, having its rear side rounded, so as to be capable of turning in any direction, while the rounded part bears against the front of the fixed jaw, and having a socket, in combination with a ball, provided with a vertical stem, the lower end of which, by any convenient device, is connected with said fixed jaw, whereby the said intermediate jaw automatically changes its position to suit any angle of the piece or article to be held between it and an ordinary movable jaw of a vise, as herein-after fully described.

In the accompanying drawings, Figure 1 is a plan view of my improved vise. Fig. 2 is a vertical section at the line *x x* of Fig. 1. Fig. 3 is a front elevation of the improved vise without the movable front jaw. Fig. 4 is an edge view of the same.

Like letters of reference in all the figures indicate the same parts.

A is the upper end of a fixed jaw of a vise. B is an automatically-adjustable jaw or clamping-piece in front of the fixed jaw, and in the rear of the front and movable jaw, (which is not shown in the drawings.) The said jaw B is provided with a socket, *a*, which fits the ball D on the vertical stem C, the lower end of which passes through the horizontal bar F, which has projecting pins *b b* at its ends, that pass through the front ends of the bars H H, and have nuts *d d*, by which the bars at this end are confined to the edges of the jaw A. The rear ends of the bars are confined to the jaw by means of the rod I, which rests against the rear side of the jaw. The rod has a shoulder, *e*, on one end, which bears against the contiguous bar H, and a thumb projection for manipulating the rod, and at its other end a screw-thread, which passes through the rear end of the other bar H, whereby the bars are firmly clamped at their rear ends against the

jaw. There are set-screws J J, which pass through the horizontal bar F, their ends bearing against the front of the jaw A, to draw it firmly against the rod I.

By this means the clamping device is suited to jaws of various thicknesses.

The rear side of the jaw B is rounded both lengthwise and crosswise, whereby, as the jaw turns upon the ball D, above described, its rounded side may rest against the front side of the fixed jaw B, as a piece of any angular form is clamped between the said adjustable jaw and the ordinary movable jaw, the former automatically adjusting itself to the shape of the piece held between the two jaws. There is a screw-thread cut on the lower end of the vertical rod C, on which is the nut *f*, which bears upon the upper side of the bar F, and is so adjusted as to bring the upper side of the adjustable jaw B in line with the front jaw. A set-screw, *g*, in one end of the projection *h* of the bar F, is used to prevent the vertical ball-stem C being raised out of its adjusted position in the clamping process, the end of the screw bearing against said rod, as shown in Fig. 3.

When face of the jaw B is not required to be on an angle in its vertical direction, the screw *i* is forced downward, so as to bring its point into the hole *j* of the ball D, as seen in Fig. 2; but when it is required to be on an angle to suit the piece to be clamped, the screw is withdrawn to allow the turning of said jaw, to bring its face on any desired angle either way from a perpendicular position, as illustrated by dotted lines in Fig. 4.

For ordinary work, such as does not require the use of the adjustable jaw B, it is detached from the permanent jaw A by the withdrawal of the screw-rod I.

I claim as my invention—

1. The adjustable intermediate jaw B, rounded on its rear side, and having a socket, *a*, in combination with the stationary jaw A and ball D, having a stem, C, connected at its lower end with the bar F or other suitable device, whereby the said jaw B has an automatic adjustment in adaptation to beveled pieces or articles to be held between said jaw and the front jaw of a vise, substantially as set forth.

2. The combination of the ball-stem C, bars F and H H, rod I, and stationary jaw A, substantially in the manner and for the purpose set forth.

3. The combination of the set-screw *i* with the jaw B and ball D, for holding the jaw in a vertical position, substantially as set forth.

4. The combination of the set-screw *g* with the bar F and rod C, substantially in the manner and for the purpose set forth.

5. The combination of the set-screws J J with the bar F and jaw A, as and for the purpose set forth.

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Witnesses:

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