3 Sheets--Sheet 1.

M. & W. PICKEN.

Vise.

No. 161,820. Patented April 6, 1875.

FIG 1

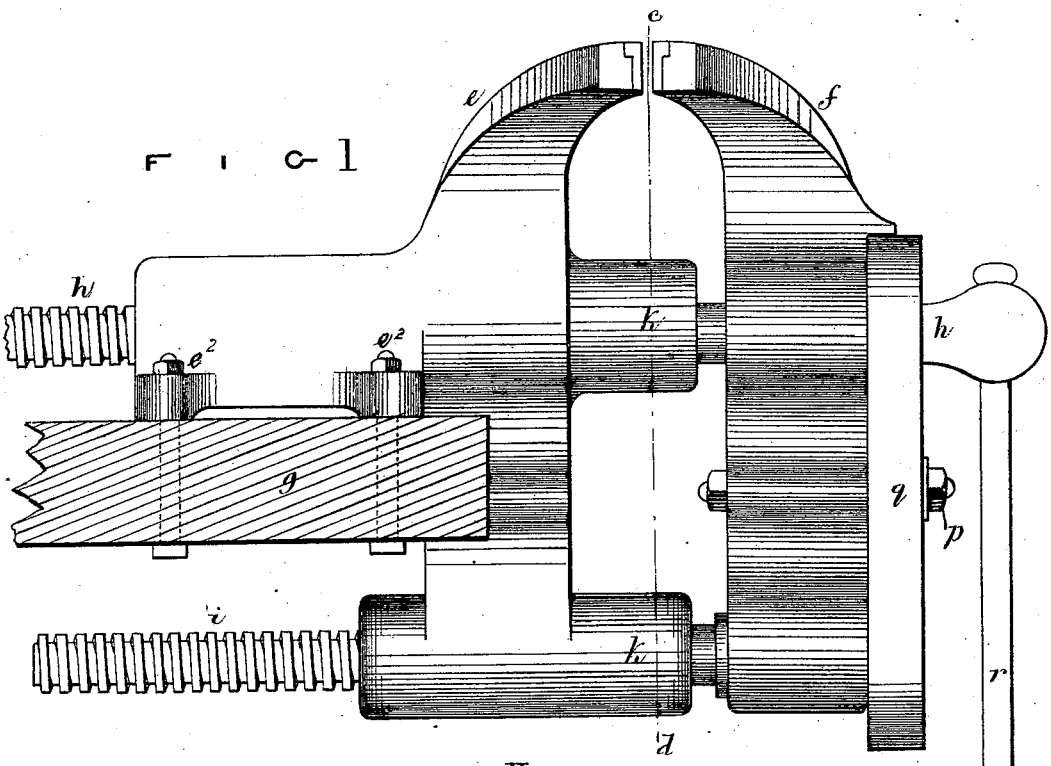

FIG II

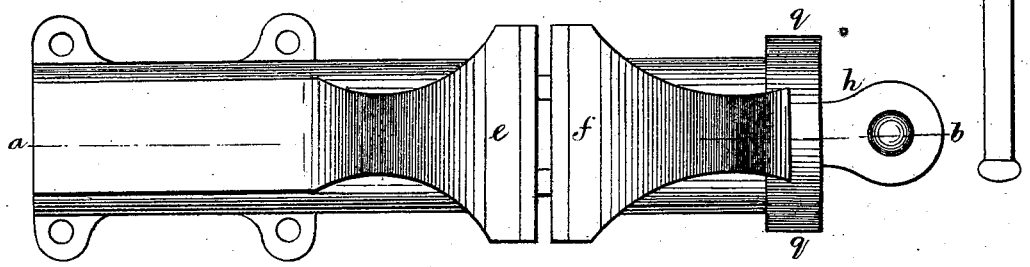

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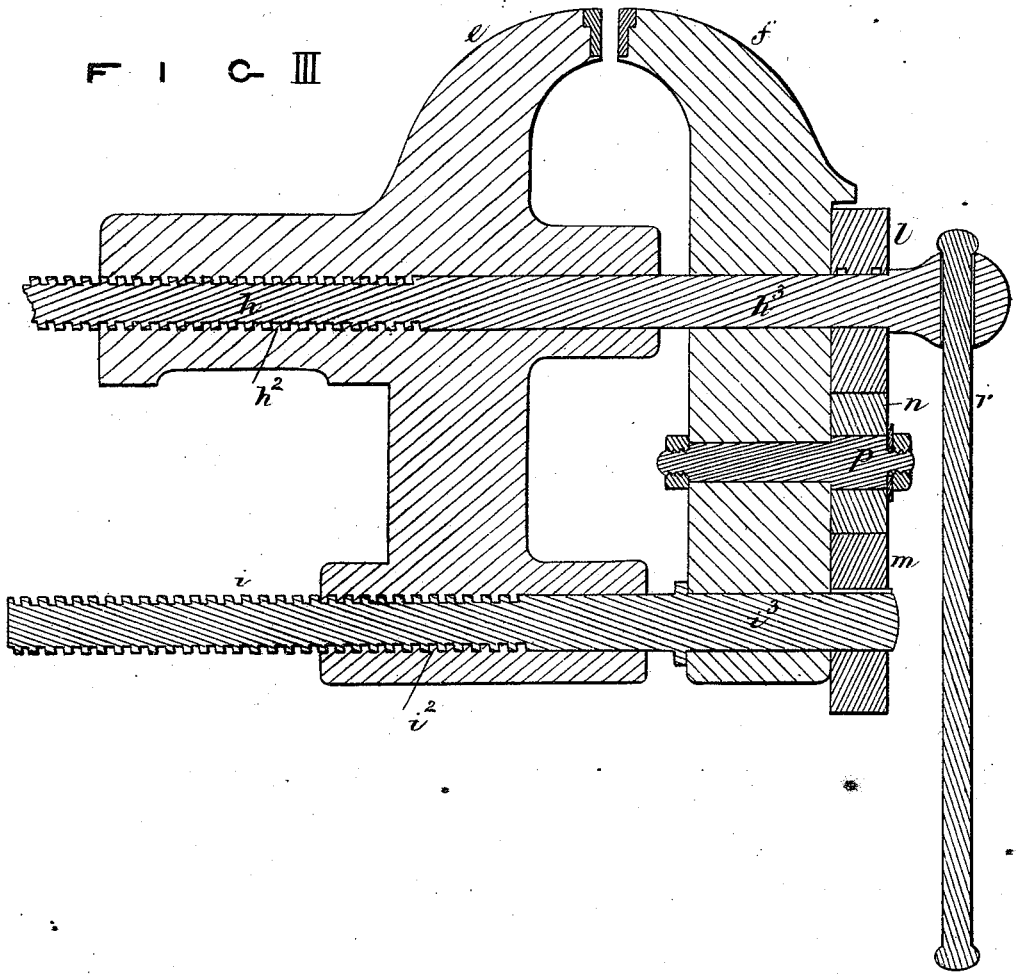
FIG. III



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M. & W. PICKEN.

Vise.

No. 161,820. Patented April 6, 1875.

FIG IV

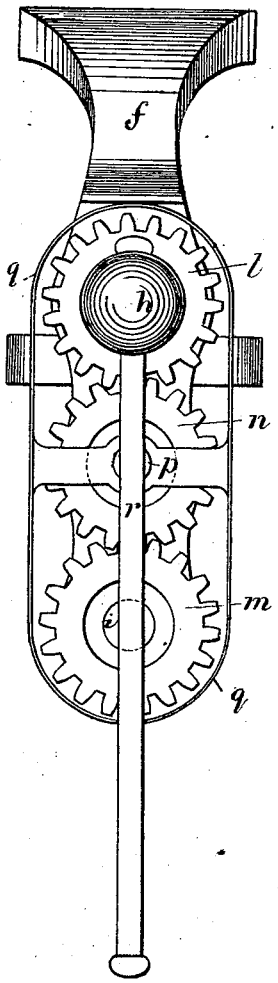
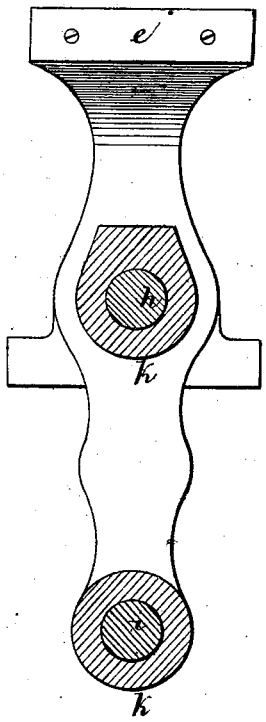


FIG V



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UNITED STATES PATENT OFFICE.

MATTHEW PICKEN AND WILLIAM PICKEN, OF BIRMINGHAM, ENGLAND.

IMPROVEMENT IN VISES.

Specification forming part of Letters Patent No. **161,820**, dated April 6, 1875; application filed November 30, 1874.

To all whom it may concern:

Be it known that we, MATTHEW PICKEN and WILLIAM PICKEN, both of Birmingham, in the county of Warwick, England, machinists, have invented Improvements in Vises, of which the following is a specification:

Our invention consists of the improvements hereinafter described and claimed.

According to our invention, we support and work the movable jaw of the parallel vise in the following manner: Revolving in and carried by the fixed jaw of the vise are two right-handed parallel screws, the said screws working in tubular guides in the said fixed jaw. Screw-boxes are made in the fixed jaw, in which the parallel screws engage. The plain ends of the parallel screws pass through and revolve in the movable jaw, the said plain ends projecting from the front of the movable jaw, and have upon them toothed wheels, the said toothed wheels being geared together by a toothed wheel between them, working on the movable jaw. The gearing described is protected by a metal strap or covering-plate. The handle of the vise is fixed on one of the said screws. By turning the said handle the screw is rotated, and rotation in the same direction is transmitted through the toothed gearing described to the other and parallel screw. The two screws are thereby simultaneously rotated in the same direction, and made to advance in or retire from the screw-boxes in the fixed jaw. The movable jaw is thereby made to approach to or recede from the fixed jaw, the said movable jaw working parallel with the fixed jaw.

Instead of using two right-handed screws geared together by an intermediate wheel, as described, a right-handed screw and a left-handed screw, without an intermediate wheel, may be employed. In this last case the toothed wheels on the ends of the screws gear directly with each other.

We will now describe, with reference to the accompanying drawings, the manner in which our invention may be performed.

Figure 1 represents in side elevation, Fig. 2 in plan, and Fig. 3 in longitudinal vertical section, a parallel vise constructed according to our invention. Fig. 4 is an end elevation of the same, and Fig. 5 is a cross-section of the same. The section, Fig. 3, is taken on the line *a b* of Fig. 2, and the section, Fig. 5, is taken on the line *c d* of Fig. 1.

The same letters of reference indicate the same parts in the several figures of the drawings.

e is the fixed jaw of the parallel vise, secured by the screws and nuts at e^2 to the bench *g*. *f* is the movable jaw, and *h i* are the two right-handed parallel screws by which the movable jaw *f* is supported and worked. In the said fixed jaw *e* are two cylindrical guides, *k k*, in which the plain parts of the screws *h i* work, and in the rear parts of the said fixed jaw are screw-boxes h^2 i^2, in which the screws *h i* engage, as represented. The plain front ends h^3 i^3 of the screws *h i* pass through and rotate in the movable jaw *f*. On the plain ends h^3 i^3 of the screws *h i*, which project from the face of the movable jaw *f*, toothed wheels or pinions *l* and *m* are fixed, as represented, and between the said wheels or pinions *l m* is a third toothed wheel or pinion, *n*, gearing with them. The said middle toothed wheel or pinion *n* turns loosely on the axis *p*, fixed, in the manner represented in Fig. 3, to the movable jaw *f*. Around the gearing *l m n* is a metal strap or covering-plate, *q*, by means of which they are protected. *r* is the handle of the vise, connected to the end of the upper screw *h*. By turning the said handle *r* in one or other direction, the screw *h* is rotated, and the toothed wheel *l* on its end gives motion to the middle toothed wheel *n*, and the latter to the toothed wheel *m* on the end of the screw *i*. The two screws *h i* are thereby simultaneously rotated in the same direction, and the said screws made to advance in or retire from the screw-boxes h^2 i^2 in the fixed jaw *e*. By the advancing or retiring of the screws *h i* in their screw-boxes, the movable jaw *f* is made to approach to or recede from the fixed jaw *e*, and the distance between the said jaws is adjusted, the said movable jaw *f* moving parallel with the fixed jaw *e*.

Instead of using two right-handed screws, two left-handed screws may be employed.

The combination of parts described and illustrated for supporting and working the movable jaw may be modified by using, instead of two similarly-threaded screws, a right-

handed screw and a left-handed screw, working in corresponding screw-boxes in the fixed jaw.

When a right-handed screw and a left-handed screw are used, the intermediate toothed wheel *n* is omitted, and the toothed wheels on the ends of the screws, respectively, are of the same diameter, and gear directly with one another. When one of the screws is rotated, the two screws are simultaneously rotated in opposite directions, but, in consequence of the opposite directions of the threads of the said screws and their respective screw-boxes, the said screws simultaneously advance in or retire from their screw-boxes in the same direction, and thereby adjust the position of the movable jaw.

It will be noted that the plain cylindrical portions h^3 i^3 of the screws extend across the space intermediate between the two jaws, and are of such length that the jaws may be opened to the full extent usually required without uncovering or disclosing the screws. By this means all danger of clogging by dropping of chips or refuse on the screws is avoided.

The boxes or bearings for the screw-rods in the fixed jaw are formed, as shown, to receive both the plain cylindrical portions, and the screw-threaded portions, of said rods. The screw-threaded parts of the bearings are back of the plain cylindrical parts, and each bearing or box is of a length to afford a perfect support for the movable jaw without the assistance of the slides ordinarily required.

We are aware that parallel screw-rods, geared together and supporting the movable jaw of a vise are not new, and we are also aware that the screw-rods have been constructed with the threaded portion protected by a telescopic sleeve, and these features we do not claim.

Having now described our invention, what we claim and desire to secure by Letters Patent is—

The combination, with the movable jaw carrying the geared screw-rods *h i*, having plain cylindrical front portions h^3 i^3, as described, of the fixed jaw formed with elongated bearings, screw-threaded in rear and plain in front, for reception and support of the screw-rods of the movable jaw, all constructed substantially as shown and set forth.

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