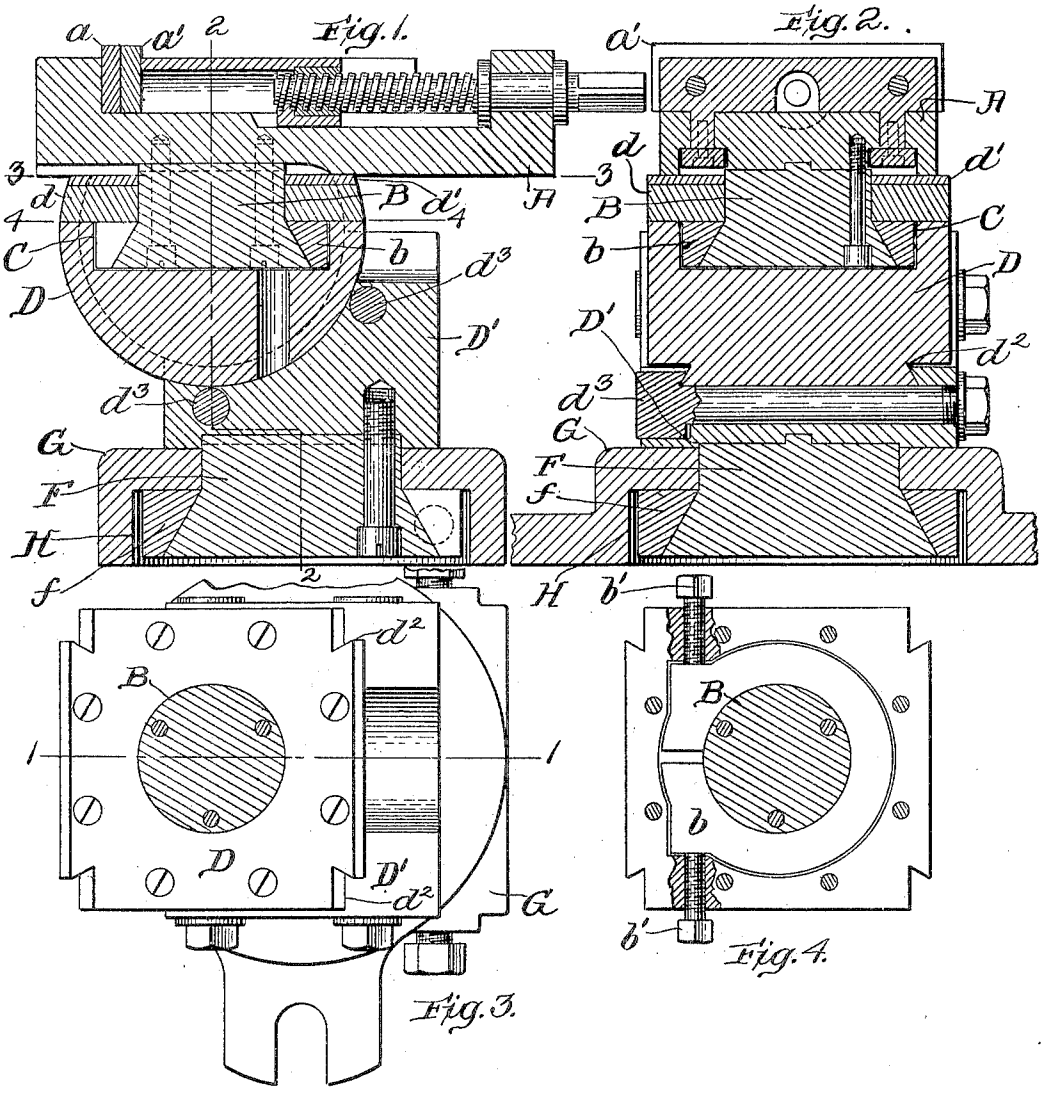
No. 797,579. PATENTED AUG. 22, 1905.

E. HULTGREN.

VISE.

APPLICATION FILED AUG. 4, 1904.



Witnesses:
M. C. Dorsey
Arthur F. Randall

Inventor:
Efraim Hultgren
by Maynadier & Rockwell,
Attorneys.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EFRAIM HULTGREN, OF ATTLEBORO, MASSACHUSETTS.

VISE.

No. 797,579. Specification of Letters Patent. Patented Aug. 22, 1905.

Application filed August 4, 1904. Serial No. 219,485.

To all whom it may concern:

Be it known that I, EFRAIM HULTGREN, of Attleboro, in the county of Bristol and State of Massachusetts, have invented a new and useful Vise, of which the following is a specification, reference being had to the accompanying drawings, making part hereof.

My invention is a three-way-adjustable vise capable of adjustment in three different planes, each adjustment being operative and having means of clamping independently of the other two adjustments, the first and third adjustments being about axes normally parallel, but offset one from the other.

The first adjustment is in a plane parallel to the bottom surface of the base, and as the base is commonly on a horizontal surface it may be said with sufficient accuracy that the first adjustment is a rotary adjustment about a vertical axis. The second adjustment is a rotary adjustment in a plane at a right angle to the plane of the first adjustment. The third adjustment is a rotary adjustment in a plane at right angles to the plane in which the second adjustment happens to be—that is, the first adjustment is made around a vertical axis and can be clamped there. The second adjustment is made around an axis at right angles to that vertical axis and can be clamped there, and this second axis must necessarily be horizontal if the first be vertical, while the third adjustment is made around an axis which is at right angles to the second axis and can be clamped there; but the position of this third axis depends upon the positions of the first and second, although the first and third axes are normally parallel, but offset one from the other.

In the drawings, Figure 1 is a section on line 1 1 of Fig. 3. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a sectional plan on line 3 3 of Fig. 1; and Fig. 4 is a section on line 4 4 of Fig. 1, illustrating the preferred construction of my three-way-adjustable vise.

The vise proper, A, consists, essentially, of jaws *a a'*, relatively movable in a suitable support, and will be well understood by all skilled in the art without detailed description. This vise A is made fast to post B, and post B is mounted in a socket C, formed to receive the conical portion of post B and the split ring *b*, which when constricted by the screws *b'* (see Fig. 4) clamps post B rigidly in socket C, the point being that when screws *b'* are slacked vise A may be turned, with post B, to any desired angle across block D and then clamped rigidly by setting-up screws *b'*, this movement being the third adjustment before mentioned. Block D is a segment of a cylinder, and the socket C in its flat face is covered by the heavy plate *d* and the thinner plate *d'* (two plates being used in practice, though one will of course answer) after the split ring *b* and post B are placed in socket C. Block D is attached to block D' by ways d^2 and bolts d^3, dovetailed, as shown in Fig. 2, so that by slacking bolt d^3 block D can be revolved on its axis with relation to block D' (carrying with it, of course, post B and vise A) and then clamped rigidly to block D' by setting up bolts d^3. This forms the second adjustment before mentioned.

Post F is fast to block D' and is mounted in base G, (see Figs. 1 and 2,) which has a socket H to receive the conical end of post F and the split ring *f*, which clamps post F and base G rigidly together, substantially as above described as to post B and block D, as will be plain. This forms the first adjustment before mentioned, being about an axis normally parallel to but offset from the axis of post B.

In operation base G is secured in place on the milling-machine, and the screws and bolts having been slacked the posts B and F and block D are adjusted each about its axis to bring vise A to its desired position and then tightened to hold each rigidly to the next, when the work is secured between the jaws *a a'* of the vise A ready to be operated on by the tool of the milling-machine.

By the proper use of the three adjustments the work can be placed in a greater variety of positions in relation to the tool or cutter of milling-machine without being loosened from vise-jaws *a a'* than heretofore known.

What I claim as my invention is—

The three-way-adjustable vise above described made up of holding-jaws mounted on a post; that post mounted to turn in a block about an axis; that block mounted to turn in a second block about a second axis perpen-

dicular to the first axis; that second block having a post mounted to turn in a base about a third axis perpendicular to the second axis and offset from it; that base; and clamping means to hold the first post rigidly to its block in any angular position, the first block rigidly to the second block in any angular position, and the second block rigidly to the base in any angular position.

EFRAIM HULTGREN.

Witnesses:
G. A. ROCKWELL,
C. B. MAYNADIER.