



## UNITED STATES PATENT OFFICE.

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## VISE.

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The object of my invention is to provide a vise which is especially adapted for being mounted on the table of a machine, for example a drilling press, so as to hold the article on which the work is to be done.

My improved vise is particularly adapted for this work because it is made of two independent halves or companion jaws, the gripping faces of which are located a substantial distance above the lead screw, thus providing a space between said companion jaws unobstructed except by the lead-screw, and thereby adapting my vise to receive and clamp elongated articles in a vertical position.

Another feature of my device which renders it especially adapted for holding particular articles as above mentioned, are the means provided by me between the clamping faces of the jaw for holding the work in different planes parallel with, and angularly to the base of the vise. These work-holding means consist in providing the jaws of the vise on their clamping faces with work supporting ledges, respectively, located adjacent holding groove extending parallel with the of the jaws; also in providing one of the clamping faces of the jaws with a work-holding groove extending parallel with, the top of such clamping face; and further in providing in combination with the jaws movable work-supporting rods supported transversely between the jaws, said rods being movable to different positions so as to support the work between the jaws in different planes parallel with and angularly to the base of the vise.

A further object of my invention is to provide a device of this character which is relatively light and which is simple in construction, adapted for many uses, and which is inexpensive to manufacture.

The further details of construction and mode of operation are hereinafter described with reference to the accompanying drawings, in which:

Fig. 1 is a perspective view of a drill press with my improved vise clamped to the table thereof;

Fig. 2 is a perspective view of my vise;

Fig. 3 is a plan view of my vise with a circular disc clamped therein and shows the relative arrangement of the supporting devices and the shoulder or ledge for supporting said disc firmly between said jaws;

Fig. 4 is a section taken on the line 4—4

of Fig. 3, showing the disc mounted upon the transverse supporting rods;

Fig. 5 is a section taken on the line 5—5 of Fig. 4, except that an angular article is gripped between the jaws and the supporting rods are arranged accordingly, a portion of one jaw being broken away to disclose said article;

Fig. 6 is a plan view of my improved vise gripping a rod or other circular object transversely of said jaws, and shows how the slot between the jaws extends entirely through the vise so that said vise can accommodate articles of considerably greater length than the width of said jaws;

Fig. 7 is a similar plan view of my vise gripping a trapezoidal object between the jaws; and

Fig. 8 is an elevation of my vise gripping a bar or other elongated object of circular section lengthwise of said jaws.

My improved vise is especially adapted for holding objects upon a machine and is here illustrated as being fastened to the table *a* of the drill press *b*. My vise is made up of two separable halves *c*, or companion jaws, each made up of an upstanding, or vertical portion *c'*, the interior opposed faces of which constitute the clamping faces of the vise, and another portion *c''*, integral therewith and extending at right angles thereto, which constitutes the base of the jaw. Said base portions *c''* are arranged so as to extend outwardly from the jaw faces, and thus a space *d* is formed between said jaw faces which extends entirely through the vise excepting the lead-screw *j*, and guide rod *k'* which are provided for supporting the lead screw. The base portions *c''* are arranged so as not to extend across said space, thus permitting elongated articles to be gripped transversely between the jaws or faces. Because of this construction, the capacity of said vise is not limited to articles which are shorter than the width of said jaws. Thus, for example, if it is desired to drill in the end of a rod *e*, as shown in Fig. 6, said rod is placed on end, and the vise is arranged on the table *a* so as to extend over the edge thereof, and holding down bolts *a'* are passed through the holes *c''* in one of said halves. The other half is not fastened but is free to slide upon said table, but is also provided with similar holes *c''* in the other base portion, by which my vise may be fastened to a table if more con-

venient. Transverse notches  $f$  formed in the jaw faces will hold the article being operated upon against movement. Many tables  $a$  are skeleton-like and thus articles  
 5 being drilled thereon can extend through one of the apertures therein and thus the vise can be seated firmly upon the central portion of said table instead of extending over one edge thereof.

10 The inner face of each jaw is provided with a projection  $g$  which provides a shoulder or ledge  $g'$ . A series of holes  $h$  are drilled through the upstanding portions of said jaws, said series being arranged length-  
 15 wise of said jaw portions and are arranged so that a plane tangential to their upper portions would aline itself with the shoulder or ledge  $g'$ . Work supporting rods  $h'$  are slidably supported in any of said series of holes  
 20 and when in position extend across the slot  $d$  between the two vise halves. Because of said arrangement, the upper surfaces of said rods are exactly in alinement with the shoulders or ledges  $g'$  and thus together form a  
 25 skeleton-like supporting surface for the article to be gripped between the jaws of said vise. For example, if a circular disc  $i$  is to be drilled the rods can be arranged, as shown in Figs. 2 to 4, so that they are  
 30 arranged parallel to each other and support the disc along its opposite edges. The shoulders  $g'$ , arranged at right angles to said rods, will support said disc along substantially the remainder of its circular edge. A circular  
 35 article held in the jaws of the vise has thus four spaced points of support and may be fixedly held for drilling or the like.

A threaded lead-screw  $j$  is provided with a nut  $j^2$  journaled in one of said halves and  
 40 said screw is threaded in a nut  $j^3$  held in the other half. Thus, when said screw is turned by its handle  $j'$  it tends to move said unfastened half relatively towards or from the other. The rods  $h'$  being substantially  
 45 uniform in cross section, thus slide freely in the holes  $h$  and thus do not interfere with the clamping action of said jaws upon the object.

I provide a corresponding series of holes  
 50  $k$  through the jaws, which are arranged along the lower edge of the upstanding portions  $c'$  on each of the separable halves of said vise. In said holes guide rods  $k'$  are  
 55 slidably mounted, similar to the rods  $h'$ , thus when an angular object  $l$  is being gripped, its upper end can be supported by a rod  $h'$  arranged at one side of the lead-screw  $j$ , and its lower end by the guide rod  $k'$  at the opposite side, as shown in Fig. 5.

60 When a trapezoidal section  $m$ , or other irregular shaped object, is to be gripped between the jaw faces, the supporting rods  $h'$  can be arranged relatively to the shoulder  $g'$  to support the same, as shown in Fig.  
 65 7. The trapezoidal section  $m$  is supported at

its wider portion upon the shoulders or ledges  $g'$  and its narrower portion is supported by a rod  $h'$ .

To drill diametrically through a circular rods said rod is held between the jaw faces, 70 in the manner shown in Fig. 8. A longitudinal groove  $n$  is cut in one of the jaw faces to prevent said circular rod from tending to twist or be displaced by the action of the drill or other tool. 75

I claim:

1. A vise comprising relatively movable jaws, each of said jaws formed on the inner face with an article supporting ledge, and article supporting elements removably co-  
 80 operating with both jaws and bridging the space between them, the article engaging surface of such elements being in the supporting plane of the ledges.

2. A vise comprising relatively movable 85 jaws, a series of openings formed in each jaw, a ledge formed on the inner surface of each jaw and tangential to said openings, and a rod cooperating with similar openings of both jaws to thereby arrange the  
 90 supporting surface of the rod in the supporting planes of both ledges, whereby an article gripped between the jaws and resting on the ledges is supported intermediate the ledges by the rod. 95

3. A vise comprising duplicate jaws, each including an upright jaw face and a lateral bearing member at the lower end of the face, one of the jaws being adapted to be fixed to a bench or like support and the other of  
 100 said jaws utilizing its lateral portion as a broad bearing for the jaw on the bench in the movement of the jaw, means cooperating with the jaws whereby one of the jaws is movable relative to the other, each jaw  
 105 being formed with a series of openings arranged in a plane extending longitudinally of the jaw, the inner face of each jaw being formed with a ledge in the plane of the upper margins of the openings of that jaw,  
 110 and rods adapted to cooperate with similar openings of the jaws to form supporting elements intermediate the jaws, the supporting surfaces of the rods being maintained in the plane of the ledges to provide for sup-  
 115 porting an article gripped between the jaws at the side edges and intermediate the side edges.

4. A vise comprising relatively movable jaws each formed on the inner face with an  
 120 article supporting ledge, a series of openings formed in each jaw and located relatively to said ledges, and a member removably supported in the openings of both jaws, thereby to provide a supplemental supporting sur-  
 125 face in the supporting planes of both ledges, whereby an article gripped between the jaws and resting on the ledges is supported between the jaws by said member.

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