UNITED STATES PATENT OFFICE.

JOHN R. LONG, OF EAST AKRON, OHIO.

AUTOMATIC MACHINE-VISE.


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To all whom it may concern:

Be it known that I, JOHN R. LONG, a citizen of the United States, residing at East Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Automatic Machine-Vises, of which the following is a specification.

This invention pertains to an improvement in automatic machine vises, all substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the vise resting upon a suitable support and showing a drill supporting arm over the same and a drill therein above the open jaws of the vise. Fig. 2 is a plan view of the vise fixed on its base. Fig. 3 is an enlarged longitudinal section of the vise and Fig. 4 is a cross section on line 4—4. Fig. 5 is a rear elevation of the vise, showing the base therewith partially broken away. Fig. 6 is a bottom view of the post supporting the vise in the base.

Fig. 7 is a detail of the handle adapted to engage and rotate the locking screw for the jaws.

In the construction and adaptation of the vise as thus shown I employ a base b adapted to be fixed on a bottom support of any suitable kind by bolts or otherwise and which has a series of radial slots 2, or their equivalent in holes, channels or grooves and in which I engage and lock the said post a.

The vise members are supported together on this post and adapted to be rotated and clamped thereon. The said post or trunnion is cylindrical and has a flange 3 about its bottom resting upon the base b and lugs 4 oppositely on its bottom adapted to enter any one of the slots or channels 2 according to the position chosen for the vise and a bore through its center for the fastening screw 5. The lugs 4 serve to prevent rotation of the said post or hub by seating closely in the slot 2, and the screw 5 fixes the post rigidly in place by engagement at its head with the bottom of the base at the sides of the slot, channel or groove 2.

Apart from the supporting elements the vise comprises the main or fixed jaw or member J and the movable jaw or member J', which are also referred to as inner and outer jaws or members, and the said main or fixed jaw has a body or shank with a rectangular opening axially front to rear through the same adapted to receive the correspondingly-shaped shank 7 of the outer jaw, and said body is provided with a lateral extension 8 at its side and outside the plane of said jaws having a circular vertical bearing fitting over and seated upon the post a, Fig. 4, and upon which the said jaw is both rotatable horizontally and adapted to be clamped when in use.

Especially attention is called to the lateral extension 8 forming a pivot point about which the jaws are rotatable for the reason that by this novel construction of the fixed jaw I am enabled to obtain engagement with the supporting base entirely outside of the jaw members but on a plane therewith horizontally, and at the same time am enabled to automatically clamp said post and lock said members against rotation when the operating screw is tightened. To this end the said jaw member J is provided with a sawed slot or slit 10 across the same bodily from its side and through from top to bottom and through one side of the vertical bearing or opening in extension 8 sleeve over post a, and the shank or body of said jaw has a cylindrical nut n set into the same from above and provided with a threaded hole transversely at its middle to engage the operating screw S therein. The said nut is seated on its upset end and removable when the screw is withdrawn. This brings slot or slit 10 on which the body is split or divided between the end bearing of the operating screw S on the outer jaw J' and the said nut, and it follows that closure of slot 10 with clamping effect on post a must occur when said screw S is tightened. Then upon release of screw S the clamp is relaxed and the jaws are rotatable together on said post to either side relatively to the drill or tool d above.

The screw S has a collar c fixed thereon and the bushing 15 at the front thereof is fixed in the jaw so that the screw is held permanently in working position.

In the operation of this vise there is liable to be considerable down pressure upon the jaws, and in order to relieve the jaws of such pressure in their operating portions I have provided the jaw J with a lug or projection 9 at its bottom which comes down at least even with the flange 3 on the post and is adapted to bear directly upon base b.
and said projection also extends somewhat forward to provide a more direct under support for the jaw J.

The handle or wrench 16 is adapted to engage with and rotate the operating screw.

The said lug 9 may have any suitable shape, and in this instance projects forward somewhat so as to serve also and directly as a medium for taking the down pressure that comes on the outer jaw also. By means of the said lug the operating strain is taken away from the post h and the parts connected therewith and a firm support is given to the jaws from beneath the same to withstand possible down pressure. The outer movable jaw J' is also provided with a boss 14 and an adjustable rest screw 13 at its bottom, whereby this movable part of the vise may be directly seated upon the table b and sustained against the down thrust and pressure upon the work held by the jaws, and which work it will be noted is held off-center to the pivot post h.

Base b in the present showing, comprises a rotatable table t having a vertical axis and shaft 15 adapted to be clamped in a clamping arm 18, fixed to support said table, and the post h for the vise is adapted to be secured radially off-center to this axis. In this way the table and vise may be rotated together relatively to the operating tool d and the work introduced into or removed from the jaws on any desired radial lines. It often occurs that the operations are merely duplicated on similar work and it is then desirable to fix the vise in a stationary position on said post h and not permit it to be unclamped upon retiring the jaw J' each time the work is released and removed and a new piece inserted. Therefore, the split portions of jaw member J are each provided with ears 11 through which a short clamping screw or collar bolt 12 extends, only one ear however being screw-threaded to grip the bolt and the other ear providing a sliding fit for the bolt, whereby a permanent clamping of the jaw member J upon post h may be obtained whenever such fixed relationship may be denied without dependence upon the clamping effect otherwise obtainable by screw S.

What I claim is:

1. A machine vise comprising a main jaw having a body provided with a tubular vertical bearing at its side and split across said body into said bearing, and a post over which said bearing is seated, a nut in said body behind said split, a movable jaw in said main jaw and an operating screw through the same engaged in said nut, whereby when the screw is tightened the parts are automatically clamped on said post.

2. A machine vise as described, comprising a post, a main jaw having an extension at its side provided with a bearing sleeved upon said post and having a split across its body into said bearing, a movable jaw having a shank projected through said body and means adapted to draw said jaws together and clamp the bearing sleeve on said post.

3. A vise having a split body provided with a post opening and a work-holding jaw, a supporting post for said body fitting snugly within said opening, a movable jaw and an operating screw therefor connected with one of the split portions of said body permitting clamping of said body upon said post through the clamping pressure placed upon the work held between the jaws, and a clamping device for the split portions of said body permitting clamping effects to be obtained upon the post independently of said operating screw.

4. A machine vise having an inner jaw member provided with a body having an axial opening through the same and a tubular support at one side of said body and having a split transversely through said body into said support and ears on the outside thereof on opposite sides of said split, in combination with a nut seated in said body behind said split, a slidable jaw having a shank extending into said body and an operating screw through the same engaged in said nut, a post on which said tubular support is seated and a screw through said ears outside said post adapted to clamp the support on said post and lock the vise independently of the operating screw.

5. A machine vise as described comprising an inner jaw member having a tubular bearing at one side of the body thereof and split transversely into said bearing and having a downward extension at its bottom beneath the jaw thereon and adapted to take the downward pressure upon the vise and a base for the vise in supporting relations to said extension, an outer jaw slidably mounted in said inner jaw member, an operating screw therefor and a nut engaged by said screw and located behind the said transverse split, and the said outer jaw having an adjustable support adapted to rest on said base, whereby when the operating screw tightens the work in the jaws the said jaws are clamped on the post and the downward pressure on both jaws is sustained.

Signed at Cleveland in the county of Cuyahoga, and State of Ohio, this 24th day of October, 1917.

JOHN R. LONG.