J. R. SAYLOR.

MACHINE VISE.

APPLICATION FILED APR. 26, 1912.

**1,089,273.**

Patented Mar. 3, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

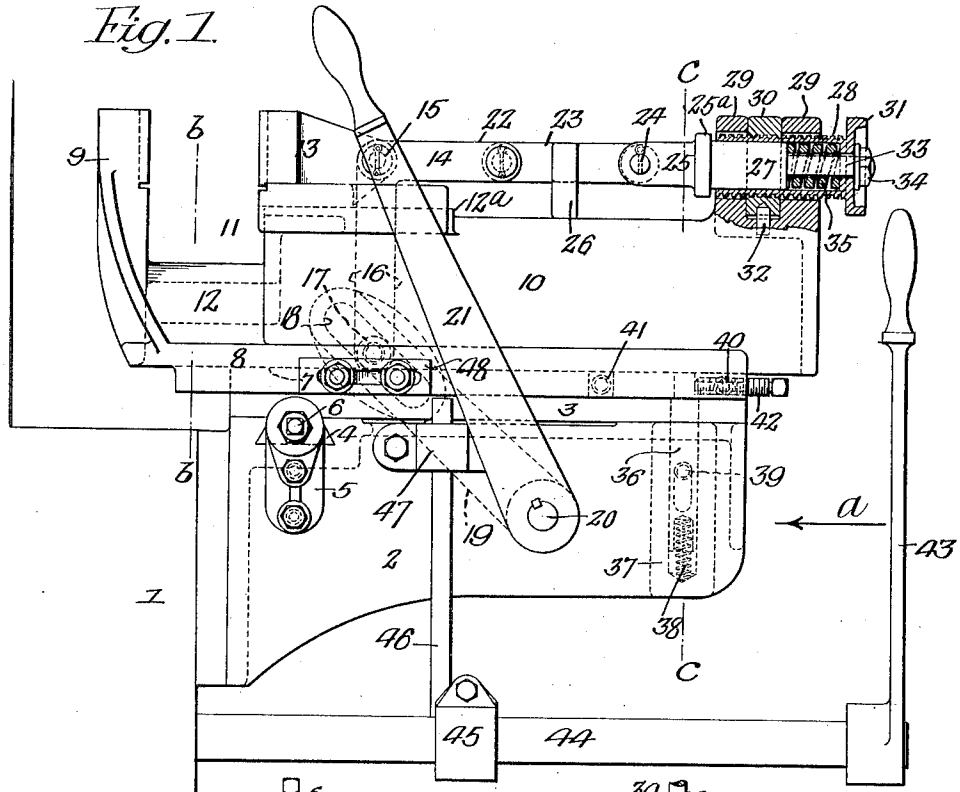
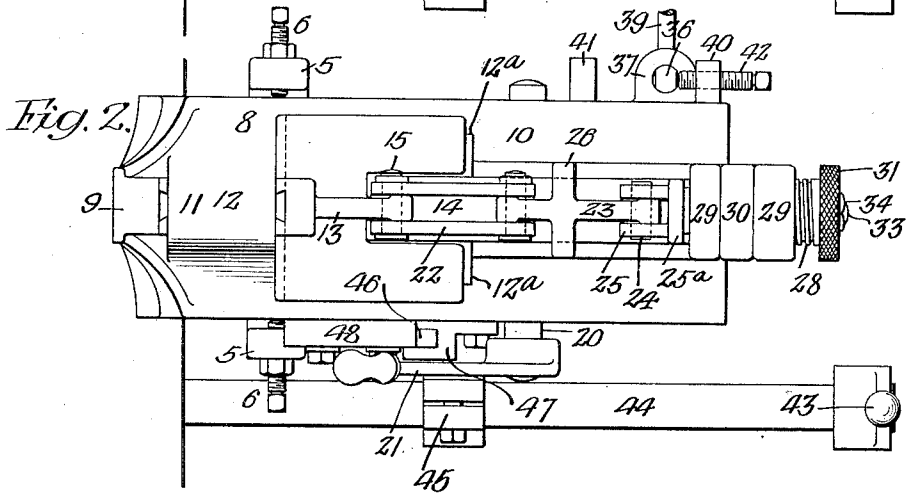



Fig. 2.




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2 SHEETS—SHEET 2.

Fig. 3.

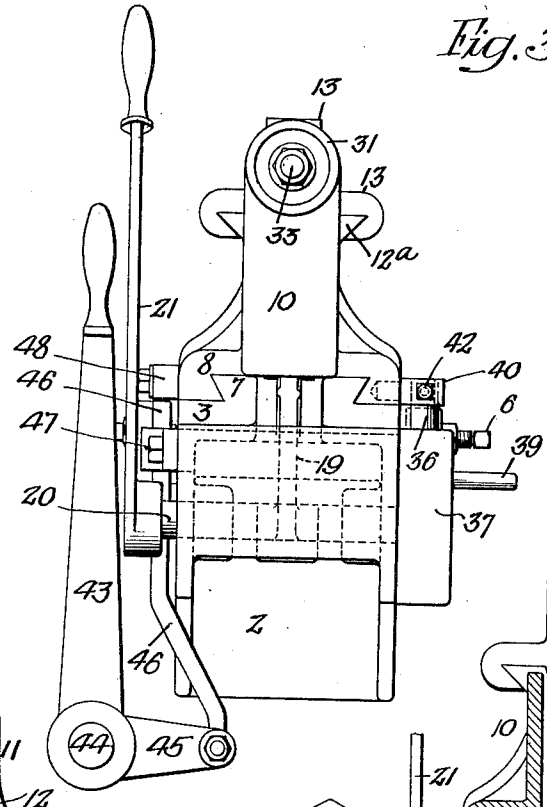



Fig. 4.

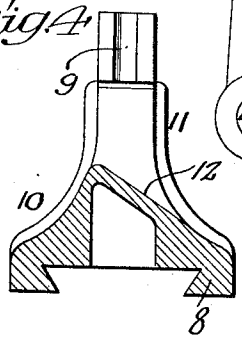



Fig. 7.

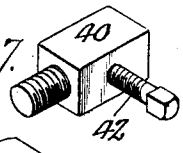



Fig. 6.

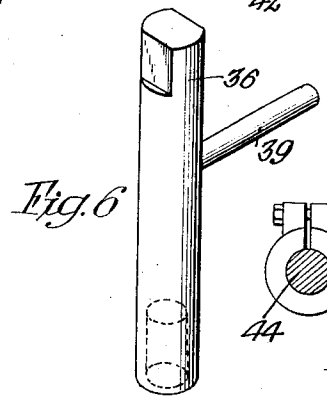
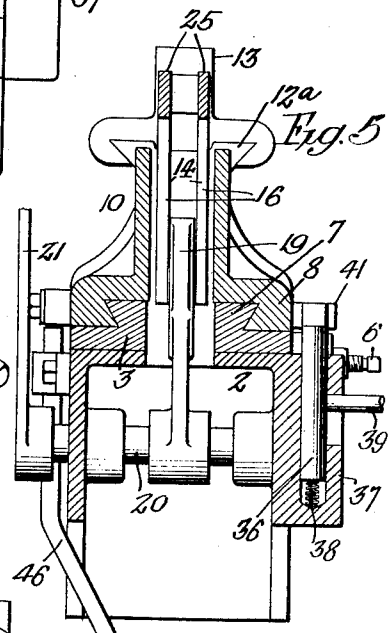



Fig. 5.




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# UNITED STATES PATENT OFFICE.

JOHN R. SAYLOR, OF POTTSTOWN, PENNSYLVANIA.

## MACHINE-VISE.

1,089,273. Specification of Letters Patent. Patented Mar. 3, 1914.

Application filed April 26, 1912. Serial No. 693,425.

*To all whom it may concern:*

Be it known that I, JOHN R. SAYLOR, a citizen of the United States, residing in Pottstown, county of Montgomery, State of Pennsylvania, have invented certain Improvements in Machine-Vises, of which the following is a specification.

My invention relates to certain improvements in vises, particularly adapted for use in holding work in tapping and drilling machines.

One object of my invention is to construct a vise so that the jaws can be adjusted to accommodate work slightly differing in size.

A further object of the invention is to locate the adjusting means so that it can be operated without dismantling the parts.

A still further object of the invention is to construct the vise so that the work will be discharged laterally from the machine, when the vise is released.

The invention also relates to certain details which will be described hereafter.

In the accompanying drawings:—Figure 1, is a side view of my improved vise as applied to a tapping machine; Fig. 2, is a plan view of the vise; Fig. 3, is an end view looking in the direction of the arrow *a*, Fig. 1; Fig. 4, is a transverse sectional view on the line *b*—*b*, Fig. 1; Fig. 5, is a transverse sectional view on the line *c*—*c*, Fig. 1; Fig. 6, is a detached perspective view of the stop pin; and Fig. 7, is a detached perspective view of an abutment.

Referring to the drawings, 2 is a bracket forming a support and, with the mechanism, secured to the frame 1 of the machine to which the vise is applied, a tapping machine in the present instance, and adjustable laterally on this bracket is a plate 3 having an undercut transverse tongue 4 adapted to undercut ways in the bracket. On the extensions 5 of the bracket are set screws 6, which bear against the sides of the plate, so that the plate can be adjusted laterally to aline with the tool. The plate 3 has a longitudinal undercut rib 7 and adapted to this rib is a slide 8 which carries what may be termed the fixed jaw 9. This slide has a body portion 10 and between the body portion and the fixed jaw 9 is a throat 11 having an inclined surface 12, Fig. 4, which, when the jaws are opened, directs the finished work to one side of the machine. Heretofore, it has been the usual practice to provide an opening in the slide through which the work drops, but this is objectionable, as the work is limited to the size of the opening and, in some instances, the work is liable to become fast in the opening and, consequently, the construction does not allow for the free discharge of the work.

On the forward end of the body portion 10 of the slide 8 is a V-shaped way $12^a$ on which is mounted the movable jaw 13, undercut to slide on the way $12^a$. Detachable gripping faces of any suitable type can be mounted on the jaws 9 and 13; each jaw having an undercut slot to receive the gripping face. The shape of the gripping face will depend considerably upon the shape of the article to be machined.

In order to operate the movable jaw 13, I pivot a bell crank lever 14 to the rear end of the jaw at 15. One end 16 of this bell crank lever has a roller 17 adapted to a slot 18 in an arm 19 secured to a rock shaft 20 mounted in the bracket 2. On this shaft 20 is a hand lever 21 by which the shaft is rocked. The other arm 22 of the bell crank lever is connected to a link 23, pivoted at 24 to an abutment 25, forming a toggle joint, so that when the parts are in the position illustrated in Fig. 1, all of the pivots are in line and the jaw is closed. The bell crank lever, in this instance, is made in two parts located side by side, as indicated in Fig. 2, and the link 23 is made in a single part. Transverse members 26 rest upon the body portion 10 of the slide 8, so as to prevent the link passing below the horizontal locking position.

The abutment 25 has a cylindrical portion 27 adapted to an adjustable socket 28, Fig. 1, having a threaded periphery. This socket passes through openings in lugs 29 projecting from the body portion 10 of the slide 8, and between these lugs is a nut 30 threaded to mesh with the threads on the socket 28. On the end of the socket 28 is a handhold 31 by which the socket can be turned in the nut; the nut being held in position by a pin 32. In some instances the thread may be cut directly in the lugs and the nut dispensed with. Extending from the cylindrical portion 27 of the abutment 25 is a spindle 33, which projects through the end of the socket 28 and has a nut 34 thereon.

Between the shoulder of the cylindrical portion 27 and the end of the socket 28 is a coiled spring 35 which allows the abutment to yield to a limited extent. On the abutment is a shoulder $25^a$ normally clear of the

end of the socket 28, when in the position illustrated in Fig. 1. Consequently, the spring can yield until the shoulder contacts with the end of the socket. The movable jaw 13 is connected, through the toggle joint, with the abutment 25, which does not move after being forced up to the work by the lever. The slide 8, however, with its jaw 9 moves to accommodate itself to the work when the parts differ slightly in size one from the other.

By adjusting the socket 28 in the nut 30, the jaw 9 is moved and not the jaw 13.

On the bracket 2 is a stop 36, Fig. 6, which is adapted to a vertical socket 37 in the bracket, and located under the stop is a spring 38. The stop has an arm 39, which extends through a slot in the socket 37, so that the stop can be drawn down by hand when desired. On the slide 8 are two abutments 40 and 41. In the abutment 40 is a set screw 42, which can be adjusted and which bears against the end of the stop 36, which is flattened for this purpose, as illustrated in Figs. 2 and 6. The abutment 40 limits the forward movement of the slide 8, while the abutment 41 limits the rearward movement.

When it is desired to detach the slide or to move it beyond the stop 36, all that is necessary is to push down upon the arm 39, when the stop will be clear of the abutments 40 and 41.

The vise can be moved from under a tool spindle, so that ample clearance can be provided for the placing or removal of a tool.

43 is the starting lever for the machine, on which the vise is mounted. This lever is secured to a shaft 44 controlling the clutch or shifting mechanism of the machine and on the shaft is an arm 45 to which is secured a bolt 46 adapted to a guide 47 on the bracket 2. This bolt can be projected into the path of a stop plate 48 adjustably secured to the slide 8. In the present instance the stop plate is slotted and bolts extend through the slot. By this construction when the vise is moved into position under the tool it must be in position to allow the bolt 46 to clear the stop plate 48, when the starting lever 43 can be moved to start the machine, and this movement projects the bolt 46 back of the stop plate 48 and prevents the accidental withdrawal of the slide until the starting lever is moved to withdraw the bolt.

When the slide is fully withdrawn the chute 11 is in line with a chute, receptacle or carrier for receiving the finished work.

The operation is as follows:—If, for instance, a valve or other fitting is to be threaded, the hand lever 21 is moved back, and this movement not only opens the jaw by actuating the toggle joints, but the slide is moved back until the abutment 41 strikes the stop 36. This brings the jaws clear of the tap or die and in position to receive the valve or other fitting to be threaded. The work is then placed in the space between the jaws and is held by one hand, while the other hand is used to operate the lever 21. This movement of the lever first closes the jaws on the work; the pressure being sufficient to hold the work and allow the operator to remove his hands. On continued movement of the lever, the sliding friction of the slide is overcome while the jaws still hold the work, and the slide with the work is moved forward until the abutment 40 strikes the stop 36 which brings the work directly in line with the tool. On the continued movement of the lever, the sliding jaw is moved so as to firmly hold the work; the toggle being moved to the locking position. Should one fitting differ slightly from another in size, the spring 35 will allow the jaw 9 to yield. The spring is stiff enough to hold the fitting properly in place while the tap or die is cutting the thread on the fitting. If it is necessary to adjust the jaws to receive another fitting, then, instead of dismantling any of the parts, the sleeve 28 can be turned to move the jaws without altering the tension on the spring. After the thread is cut and the work on the fitting completed, the slide moves back and the jaws are opened, the fitting, being released, will drop on the inclined surface 12 forming the bottom of the throat 11, sliding down this incline to a chute or other receptacle to one side of the machine.

For the rapid production of duplicate parts, this vise withdraws from the machine proper to the predetermined point and the inclined throat will line up with a fixed chute; the withdrawal and ejection being made in order with one movement of the lever 21. In placing the next fitting the order is reversed but accomplished with one movement.

I claim:—

1. The combination of a support; a slide thereon; a fixed jaw on the slide; a movable jaw on the slide arranged to move toward and from the fixed jaw; an abutment at the rear end of the slide; a bell crank lever pivoted to the movable jaw; a link connecting one arm of the bell crank lever with the abutment; means engaging the other arm of the bell crank lever for moving the slide and for actuating the movable jaw; and means for adjusting the abutment.

2. The combination of a support; a slide thereon having a fixed jaw; a movable jaw mounted on the slide and arranged to be moved to and from the fixed jaw; an abutment on the slide; a toggle joint connecting the abutment with the movable jaw; means for actuating the toggle joint to operate the movable jaw; an adjustable socket into

which the abutment extends; and a spring between the abutment and the socket; said socket being adjustable in the slide so as to alter the position of the slide and its fixed jaw.

3. The combination of a support; a slide thereon having a body portion and a fixed jaw spaced apart to form a throat; a movable jaw on the body portion; and means for actuating the jaw; that portion of the slide forming the bottom of the throat being inclined to one side so that when the work is released from the jaws, it will drop on the inclined surface and will be discharged to one side of the machine.

4. The combination of a support; a slide thereon having a fixed jaw and having a body portion; longitudinal guideways on the body portion; a movable slide adapted to the said guideways; an abutment located at the rear of the slide; an adjustable socket mounted on the slide and adapted to be adjusted therein; a spring between the abutment and the socket; a bell crank lever; a link forming a toggle joint between the movable jaw and the abutment; and means for actuating the bell crank lever.

5. The combination of a support; a slide thereon having a fixed jaw and having a body portion; a slideway thereon; a movable jaw mounted on the slideway; said body portion having two lugs at the rear end; a nut mounted between the lugs; a socket having a thread adapted to the nut; a shouldered abutment having a portion adapted to the socket; a spring between the base of the socket and the abutment; a spindle extending from the abutment through the socket; a nut thereon; a bell crank lever engaging the movable jaw; a link connecting one arm of the lever with the abutment; a rock shaft; a slotted arm on the rock shaft connected to the other arm of the bell crank lever; and means for rocking the said shaft to actuate the movable jaw.

6. The combination of a support; a slide thereon carrying a fixed jaw; two abutments on one of said parts; a vertically movable stop on the other of said parts and projecting between the abutments; with means for withdrawing said stop out of line with the abutments; one of said abutments being adjustable; a movable jaw on the slide; toggle mechanism between the movable jaw and the slide; and means on the support for actuating the toggle mechanism.

7. The combination of a support; a slide thereon having a fixed jaw; a movable jaw on the slide; means for actuating the movable jaw; a vertically movable stop on the support; a spring for projecting said stop; two abutments on the slide between which the stop extends; and one of said abutments being adjustable.

8. The combination in a vise, of a support; a slide mounted on the support and having jaws to hold the work; a starting lever; a bolt adapted to be actuated by the starting lever and arranged to lock the slide in a predetermined position when the lever is moved to start the machine.

9. The combination in a vise, of a support; a slide mounted on the support and having a fixed and a movable jaw thereon; a shaft; a starting lever thereon; an arm on the shaft; a guide on the support; a bolt adapted to the guide and connected to the arm of the shaft; and an adjustable stop plate on the slide in the path of the bolt when the said bolt is projected by the starting lever.

10. The combination in a vise, of a support; a slide mounted on the support and having a fixed and a movable jaw thereon; means for actuating the movable jaw; a starting lever; a bolt connected to the starting lever; and means for stopping the bolt when the chuck is out of the operating position.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOHN R. SAYLOR.

Witnesses:
WM. A. BARR,
JOS. H. KLEIN.

**Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."**