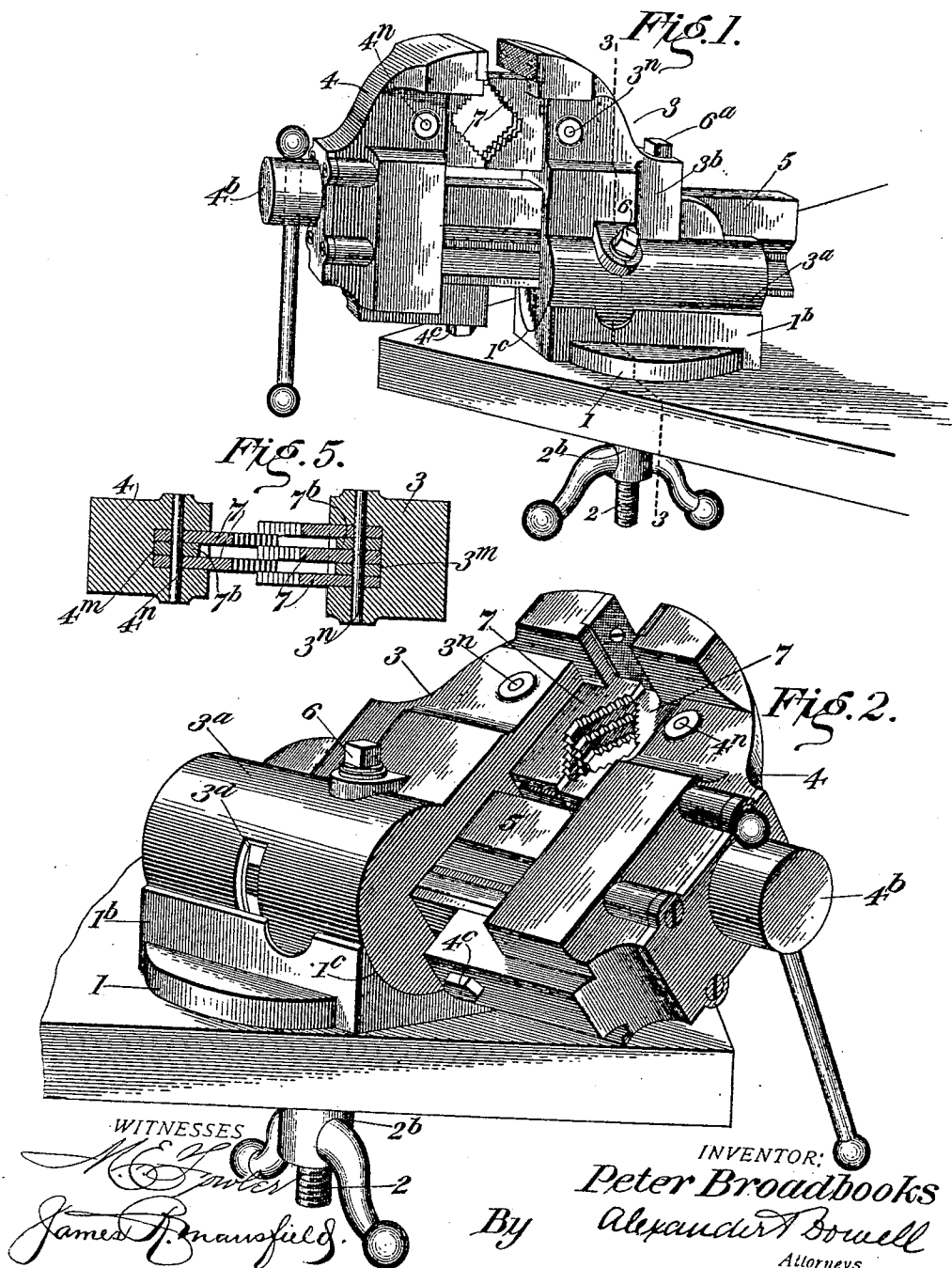


No. 851,491.

PATENTED APR. 23, 1907.

P. BROADBOOKS.
VISE.
APPLICATION FILED NOV. 30, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

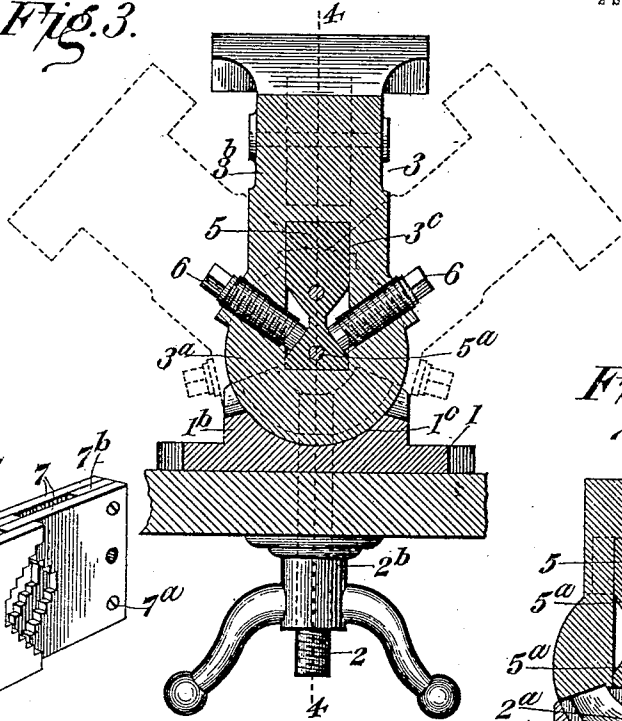


Fig. 7.

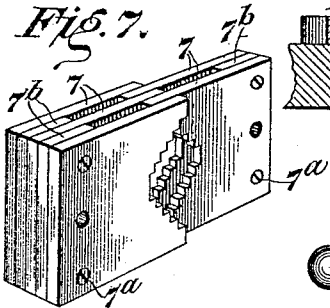


Fig. 6.

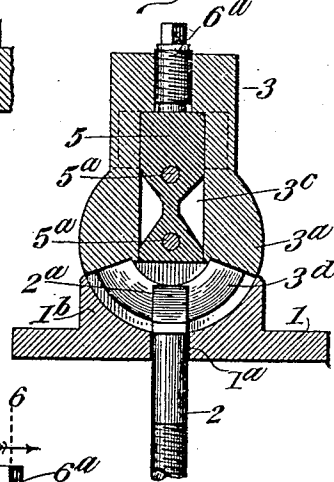
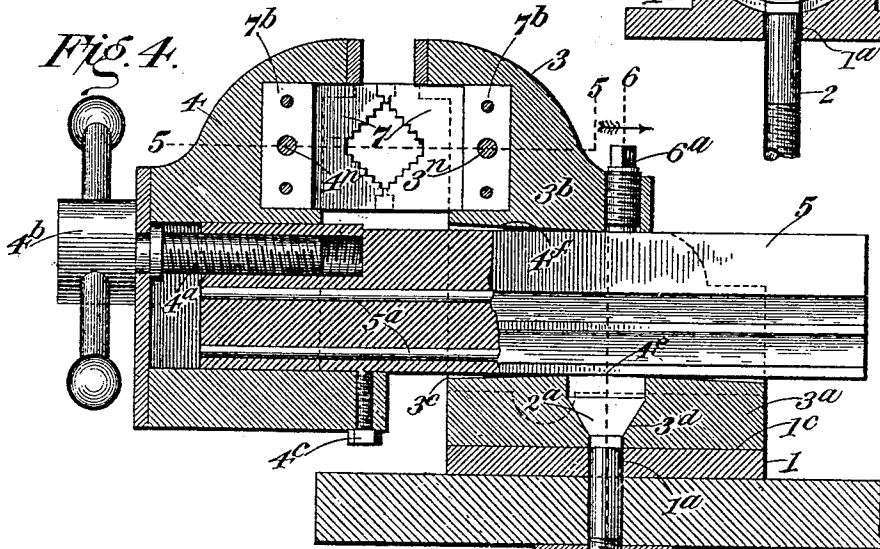


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

PETER BROADBOOKS, OF BATAVIA, NEW YORK.

VICE.

No. 851,491.

Specification of Letters Patent.

Patented April 23, 1907.

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To all whom it may concern:

Be it known that I, PETER BROADBOOKS, of Batavia, in the State of New York, have invented certain new and useful Improvements in Vises; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in vises and its object is to provide a universal adjustable vise which may be turned or rocked so as to hold the work held thereby in any position desired by the operator. For this purpose the clamping jaws are mounted so as to be tiltable upon the base-plate vertically right or left while the base-plate can be turned so as to swing the jaws horizontally right or left; this combination of a vertical and horizontal adjustment enabling the object gripped by the jaws to be held in any position desired by the operator.

The vise can be locked in any desired position by simply manipulating one hand-wheel or nut beneath the base-plate and by loosening this nut the jaws can be rocked on the base and the base turned in any desired position, and by tightening the nut the parts are rigidly locked in any desired position. This nut is located underneath the work-bench, hence is readily accessible and obviates the necessity of removing the work from the vise.

The vise is also provided with removable and changeable pipe or rod-gripping clamps which enables it to be used for holding round work as well as straight or angular work.

In the accompanying drawings I have illustrated the vise and will now explain the same in detail by reference to such drawings and refer to the claims as part of the description for summaries of the parts for which protection is desired.

In said drawings—Figure 1 is a perspective view of the complete vise in upright position. Fig. 2 is an enlarged perspective view showing the vise swung to the right. Fig. 3 is a section on line 3—3, Fig. 1, showing the jaws swung left and right in dotted lines. Fig. 4 is a longitudinal section on lines 4—4, Fig. 3. Fig. 5 is an enlarged section on line 5—5, Fig. 4. Fig. 6 is a section on line 6—6, Fig. 4. Fig. 7 is a perspective view of the pipe-gripping jaws detached.

The base or rocker-plate 1 is approximately circular in plan and is provided with a central aperture 1^a for the passage of the fasten-

ing and pivot bolt 2. It is also formed on its upper surface with a diametrical disposed projection 1^b which is concaved on its inner surface as at 1^c, to fit the lower cylindrical portion 3^a, of the rocking-jaw 3. The lower portion 3^a of this rocking jaw is shown in part as cylindric to fit in the concave bearing of the rocker-plate and long enough to prevent longitudinal oscillation on the rocker-plate but can turn laterally on said plate and support the jaw whether it be in vertical position or turned to either side as indicated in Fig. 3. From this portion 3^a rises a vertical nut portion 3^b on the upper end of which is the jaw proper. Through the parts 3^a, 3^b, extends a longitudinal slot 3^c in which is fitted a sliding bar 5, carrying the adjustable jaw 4.

The cylindric portion 3^a of the rocking jaw is provided in its under side and below slot 3^c with a transverse slot 3^d, which is triangular in cross section as shown in Fig. 4, and being wider in its inner side than at bottom and its walls tapering from the upper or inner mouth of the slot to the outer or bottom mouth of the slot. And the head of the bolt 2, extends into the slot 3^d and prevents longitudinal movement of the rocking jaw on the rocker-plate. The head 2^a of this bolt viewed from the front is the same width as the shank of the bolt but viewed from the side it is triangular, see Fig. 4, and has a V-shape,—the bevel sides of the heads conforming to the bevel walls of the slot 3^d and being adapted to frictionally clamp the walls of said slot when the nut 2^b on the lower end of the bolt is tightened. This bolt can be readily inserted into the slot 3^d by turning its head lengthwise of the slot and after insertion into the slot 3^d, the head is turned transversely of the slot and then the head will engage the walls of the slot as indicated in Fig. 4, and will retain the rocking jaw in position upon the rocker-plate. By loosening the hand nut 2^b, the rocking jaw can be swung right or left as indicated in Fig. 3, in a vertical plane and the rocking jaw and rocker-plate can be turned right or left in a horizontal plane as indicated in Figs. 1 and 2, and when adjusted to the desired position by simply tightening nut 2^b the rocker jaw and rocker-plate will be held rigidly until the nut is again loosened.

The adjustable jaw 4 is slidably mounted upon the outer end of the sliding bar 5, and may be adjusted on said bar by means of the

screw 4^a and end piece 4^b as usual, and it may be desired to positively lock to the side bar by means of tap-bolt 4^c. The sliding bar 5 may be made of cast-iron reenforced with steel rods 5^a, which may be arranged in the mould and incorporated in the bar during the casting operation. These steel bars extend the entire length of the sliding bar and give great strength thereto.

Preferably the bottom of the opening or longitudinal slot 3^c, in the rocking jaw through which the bar 5 passes, is made with an angle, as indicated in Fig. 3, the apex of the angle 4^e forming a fulcrum or biting-point for the sliding jaw,—the top of the opening being slightly tapered as at 4^f so as to permit the bar when lifted at its outer end to be free from the fulcrum and therefore readily adjusted longitudinally, but when lowered upon the fulcrum the latter will bite the bottom of the sliding bar and lock it and the movable jaw relatively to the rocking jaw. To insure the biting action of the fulcrum, I preferably make this sliding bar with angular grooves in its sides, as indicated in Fig. 3, and tap through the walls of the rocking jaw bolts 6, on opposite sides of the jaw, see Fig. 3, the inner ends of which are adapted to engage the opposite bevel walls of the lower ends of the grooves in the sliding bar and when the outer end of the sliding bar is lowered, and thus insure its being held by the fulcrum.

In addition to side bolt 6, a third side bolt 6^a may be tapped through the rear upper surface of the jaw in position to have its lower ends engage with the top of the bar 5, in rear of the fulcrum and afford an additional bearing for said bar. This third bolt 6^a being particularly useful on very heavy vises as it gives the bar three bearing points against bolts 6, 6^a, on its upper side.

To assemble the vise, the rocker-plate 1 is placed upon the bench or support to which the vise is to be attached over a suitable opening in the bench for the passage of the lower end of the bolt. The bolt 2, is then inserted in the slot 3^a in the lower portion of the rocking jaw and given a quarter turn so that its head will engage the walls of the slot, as indicated in Fig. 4, then the bolt is inserted through the rocker-plate and the nut 2^b screwed on the lower end thereof so as to hold the rocking jaw upon the rocker-plate. The bar 5, to which the movable jaw has been previously connected, is then inserted through the slot 3^c, in the rocking jaw and the vise is ready for operation. It will be seen that when the handle-nut 2^b is loosened the vise may be turned as a whole right and left on the rocker-plate and the rocking jaw can also be swung to right or left on the rocking plate, thus assembling the vise quickly in any desired position. By simply lifting the adjustable jaw so as to rock the bar 5 on its

fulcrum 4^e and clear its upper surface from the bolts 6, 6^a, the movable jaw can be quickly moved toward or from the rocking jaw, so as to get quick action and bring it up to its work, then when it is released the sliding bar 5 is locked by fulcrum 4^e and contacts with points of bolts 6, 6^a. The movable jaw can then be adjusted by the operating screw 4^a so as to more tightly clamp the work.

In order to adapt the vise for holding round objects such as pipes or rods, I provide the jaws 3 and 4, with removable clamping plates 7, shown more clearly in Figs. 5 and 7. These clamping plates are made of sections riveted or screwed together as at 7^a and properly separated by interposed blanks 7^b, and the plates attached to one jaw alternate with those attached to the other jaw, as indicated in Figs. 5 and 7, so that they do not come directly opposite each other but will telescope and consequently the inner V-shaped clamping edges of these plates can engage and securely hold various sizes of pipes. By making these gripping plates in sections, I avoid the necessity of re-sharpening the entire set or replacing the entire set in case of damage to any one of them. These pipe die-stocks may be detachably attached to the jaws 3 and 4, which jaws are provided with recesses 4^m and 3^m, below their straight work-clamping portions, into which recesses or sockets the base of a nest of die-stocks can be inserted and secured by bolts or rods 3ⁿ, 4ⁿ, as indicated in the drawings. This facilitates the removal of the die-stocks for repairs or when it is not desired to use the same. These pipe die-stocks are each made up of several plates 7, which are thin and can be punched out to gage so that if one plate needs sharpening or to be replaced by another, this can be done at less expense than with thick plates of the ordinary pipe vises. The plates in my die-stocks being close together will hold up more firmly and will not bend or injure the pipe as will vises wherein the stocks are thick and the spaces consequently large.

By my improved vise the work need not be disturbed while shifting the vise to different angles or positions. The jaws can be adjusted practically instantaneously to the work. The adjustments either rocking or revolving the vise are very simple and yet very positive; the vise can be rigidly fixed at any angle or position and my vise is specially desirable for machinists use and as a combination pipe vise.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. The combination of a rocker-plate rotatably mounted upon a support, a pivotal locking bolt for said plate, a rocking jaw supported upon the plate and having a cylindrical base portion fitted to a corresponding groove

in the rocker-plate, said base portion having a transverse slot angular in cross section, and said bolt having an angular head engaging said transverse slot; with a tiltable sliding bar extending through the rocking jaw and tiltable therein, and adapted to be locked in position by gravity, a movable jaw on the outer end of said bar, and means for adjusting said movable jaw on said bar.

- 10 2. The combination of a rocker-plate rotatably mounted upon a support, a pivoting and locking bolt for said plate, a rocking jaw supported upon the plate and having a cylindric base portion fitted to a corresponding
15 groove on the rocker-plate, said base portion having a transverse slot angular in cross section and said bolt having an angular head engaging said transverse slot, said rocking jaw also having a longitudinal slot in it above
20 the transverse slot, and said slot having an angle; with a tiltable sliding bar extending through the longitudinal slot in the rocking jaw and fulcrumed on the said angle, and a movable jaw on the outer end of said
25 bar.

3. In a vise, the combination of a rotatable rocker-plate having a concave bearing on its upper side, a rocking jaw having a cylindric base portion fitted to the concave bearing in
30 the rocker-plate, and provided with a longitudinal slot for a sliding bar, an angle in said slot and a transverse slot below the longitudinal slot, said transverse slot having its side walls beveled, and a bolt having a
35 beveled head engaging the beveled side walls of the transverse slot and passing through the rocker-plate and rocker-plate support, and a locking nut on the lower end of said bolt; with a tiltable sliding bar fitted in the
40 longitudinal slot in the rocking jaw and fulcrumed on said angle, and a movable jaw on the outer end of said sliding bar.

4. The combination of a rocker-plate adapted to be rotated horizontally and provided with a concave groove on its upper
45 surface, a rocking jaw having a cylindric base portion fitted to the groove of the rocker-plate and having a transverse slot V-shaped in cross section, and a longitudinal
50 slot above the transverse slot; a pivot and locking bolt having a V-shaped head engaging the V-shaped walls of the transverse slot, said bolt extending through the rocker-plate and its support, and a locking nut on the

lower end of the bolt below the support; with
55 a tiltable sliding bar fitted in said longitudinal slot, adjustable bolts tapped through the rocking jaw and engaging said bar, and a movable jaw mounted upon the outer end of said sliding bar.

5. In a vise, the combination of a rotatable base plate having a diametrical concave bearing on its upper side, a rocking jaw having a cylindric base portion fitted to the
60 rocker-plate bearing and provided with a longitudinal slot for a sliding bar, said slot having an angle in its bottom, said base portion also having a transverse slot below the longitudinal slot, said transverse slot being V-shaped in cross section; with a bolt having a
65 V-shaped head engaging the beveled walls of the transverse slot and passing through the rocker-plate and rocker-plate support, a locking nut on the lower end of said bolt, a sliding bar fitted in the longitudinal slot in the
70 rocking jaw and resting upon the angle therein, and a movable jaw attached on the outer end of said sliding bar.

6. The combination of a rocker-plate adapted to be turned horizontally and provided with a diametrical groove in its upper
80 surface, a rocking jaw having a cylindric base portion fitted in the groove of the rocker-plate and also having a transverse slot V-shaped in cross section, and a longitudinal slot above the transverse slot provided with an angular projection on its bottom, a pivot and locking bolt having a V-shaped head engaging V-shaped walls of the
85 transverse slot, said bolt extending through the rocker-plate and its support, and a locking nut on the lower end of the bolt below the support; with a tiltable sliding bar mounted in said longitudinal slot and resting upon the angular projection therein, adjustable bolts
90 tapped through the rocking jaw and engaging said bar above the fulcrum, a movable jaw adjustably mounted upon the outer end of said sliding bar, and a bolt for adjusting said movable jaw on the bar.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

PETER BROADBOOKS.

Witnesses:

BERTHA A. SAILE,
FLORA B. WEED.