No. 851,398. PATENTED APR. 23, 1907.

P. BROADBOOKS.

VISE CLAMP.

APPLICATION FILED DEC. 12, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

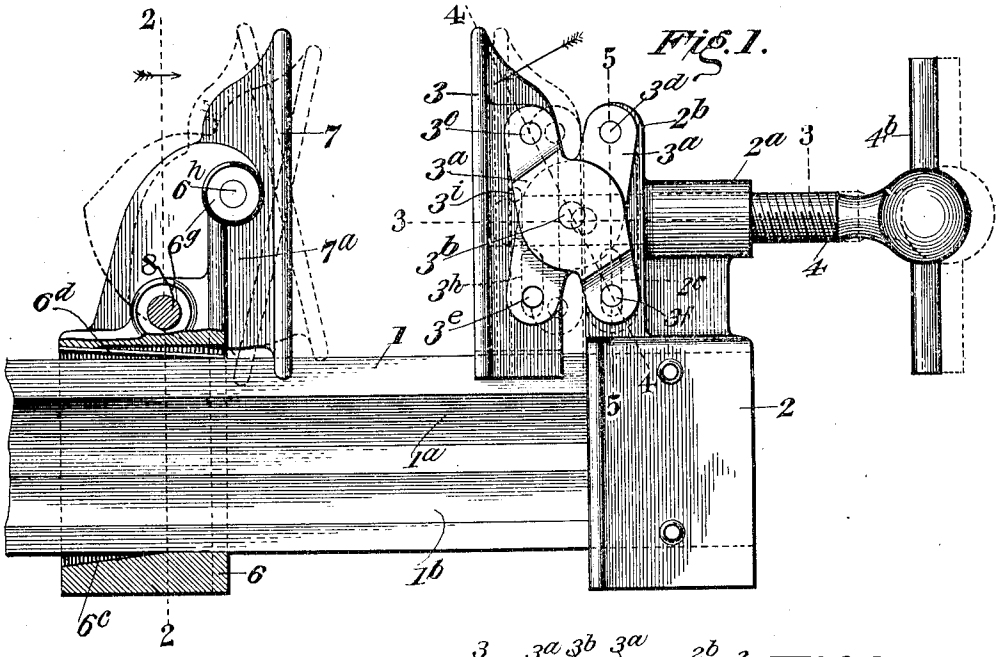


Fig. 2.

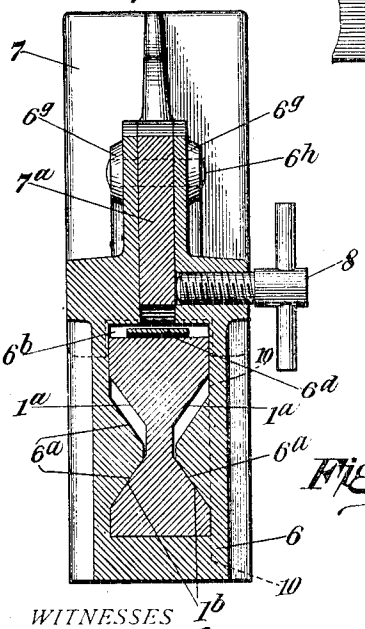


Fig. 3.

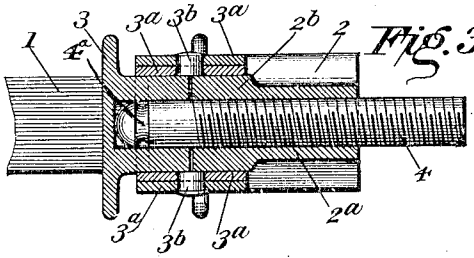


Fig. 4.

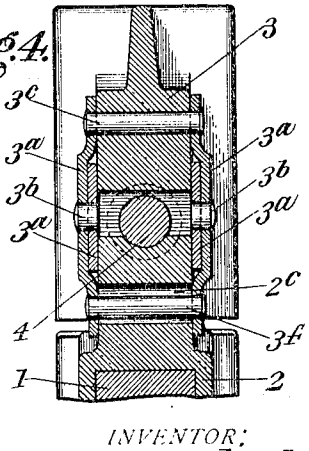


Fig. 5.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 6.

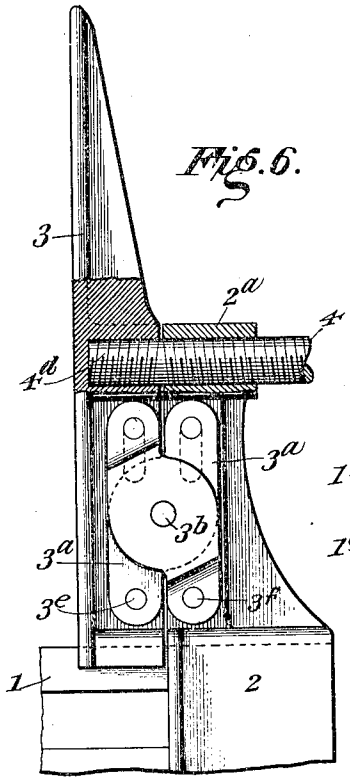


Fig. 7.

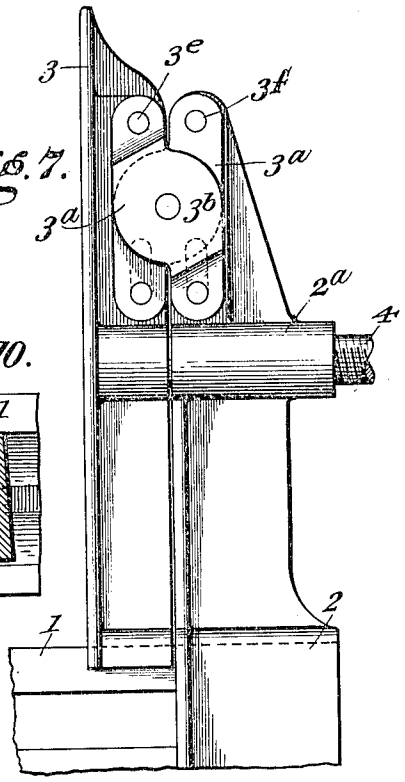


Fig. 10.

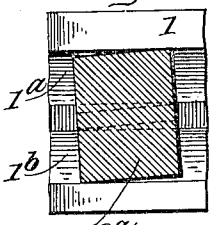


Fig. 8.

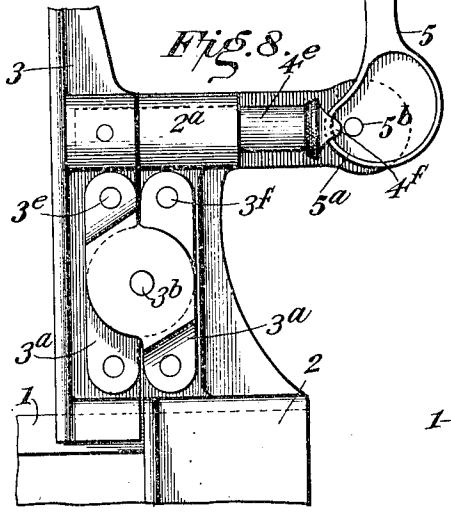
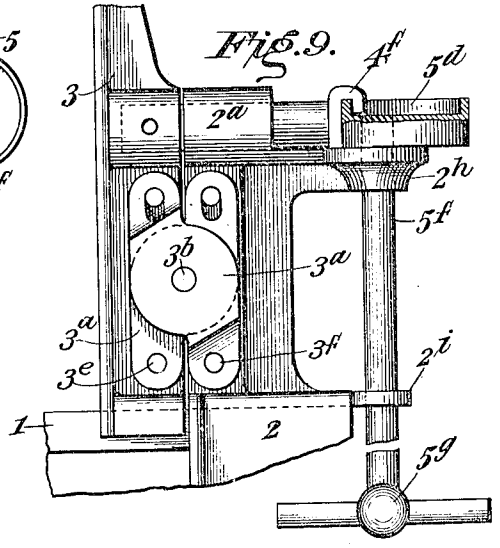


Fig. 9.



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UNITED STATES PATENT OFFICE.

PETER BROADBOOKS, OF BATAVIA, NEW YORK.

VISE-CLAMP.

No. 851,398. Specification of Letters Patent. Patented April 23, 1907.

Application filed December 12, 1906. Serial No. 347,468.

To all whom it may concern:

Be it known that I, PETER BROADBOOKS, of Batavia, in the county of Genesee and State of New York, have invented certain new and useful Improvements in Vise-Clamps; 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.

My present invention is an improved vise-clamp for use by cabinet-makers, joiners and others and wherever an adjustable vise-clamp is useful.

My object is to produce a vise-clamp wherein the movable jaw is preferably non-tiltable, and which shall move absolutely parallel to the supporting clamp-bar without any binding; another object is to provide an adjustable slide mounted on the clamping bar, with a swinging or tiltable jaw which is ordinarily self-adjusting to the work, and can also be locked in any inclined position, and securely held in such position relatively to the work; another object is to produce a vise-clamp which is light in weight, yet very strong and durable, easily adjustable to different widths of work, and which can be more conveniently operated than the ordinary clamp-vise heretofore known.

The invention consists in the novel construction of the vise-clamp as a whole, and in subsidiary features thereof hereafter described, and will be fully understood from the following description thereof in connection with the accompanying drawings, and the parts and combinations of parts for which protection is desired are stated in the claims appended to the specifications.

In the drawings—Figure 1 is a side view of the complete clamp, with some parts broken away, and indicating various positions of the jaws, by dotted lines. Fig. 2 is a transverse section on line 2—2, Fig. 1, in direction of arrow. Fig. 3 is a detail section on line 3—3, Fig. 1. Fig. 4 is a detail section on line 4—4, Fig. 1, looking in direction of arrow. Fig. 5 is a detail section on line 5—5, Fig. 1. Figs. 6, 7, 8 and 9 are detail views showing slight modifications of constructions and connection of the movable jaw to the clamping-bar. Fig. 10 is a detail section on line 10—10, Fig. 2.

The clamping-bar 1 has a head-piece 2 attached to one end thereof, and provided with a sleeve 2^a on its upper end internally threaded to engage the external threads of the adjustable screw 4 which is tapped therethrough, the axis of said screw being parallel with the bar 1. This screw is connected at its inner end to a movable jaw 3, the inner or working face of which is preferably prependicular to the bar 1, and said jaw is preferably caused to move in a plane parallel with the bar 1 at all times by means of X-links 3^a, of which two pairs are employed, one pair at each side of the jaw. The links in each pair are pivoted together centrally, or at their points of intersection, as indicated at 3^b, and the upper ends of said links are respectively pivoted to the jaw, as at 3^c, and to a projection 2^b of the head-piece, as at 3^d; while the lower ends of said links are provided with pins 3^e, 3^f respectively, which engage slots 3^h and 2^c respectively in the jaw and head 2 as shown in Fig. 1.

Obviously the pivots 3^c, 3^d, could be at the lower ends of the links, and the pins 3^e, 3^f, at the upper ends of the links, as indicated in Fig. 6. And obviously instead of having pins on the links engage slots in the head and jaw, the pins might be fast to the jaw and head, and the engaging ends of the links slotted, as indicated in Fig. 9. In each instance the desired result, to wit—the straight parallel motion of the jaw relative to the head and bar is obtained.

In the construction indicated in Fig. 1 the screw 4 has its inner end rotatably confined in a socket in jaw 3 by means of a pin 3^i tapped through the jaw and engaging an annular groove 4^a in the screw, see Figs. 1 and 3, so that while the screw is free to rotate in the jaw, it has no longitudinal movement therein. The screw 4 may be operated by a hand-piece 4^b, as indicated in Fig. 1, or of any other desired construction. In the construction indicated in Fig. 1 the screw 4 is located at a point about midway of the X-links, viewed from the side. In long jaw-clamps, however, the screw may be located above the X-links as shown in Figs. 6, 8 and 9, to better equalize the pressure.

As shown in Fig. 6, screw 4 may not only be threaded to the sleeve by a right-hand thread, but may have its inner end formed with a left-hand thread, as indicated at 4^d, and engaged with a correspondingly threaded socket in jaw 3, which construction will increase the speed of movement of the jaw 3

upon the rotation of the screw. Again, the X-links might be arranged above the screw as indicated in Fig. 7, instead of below or partly below it. Furthermore, instead of a screw 4, the movable jaw could be operated by means of cams, as indicated in Figs. 8 and 9. Thus in Fig. 8 the screw is replaced by a slide-rod 4^e connected to the jaw and passing through sleeve 2^a, and having a hooked outer end 4^f engaging a rim cam 5^a on a cam-lever 5 pivoted at 5^b on an extension of head 2, so that by turning said lever 5 on its pivot the jaw 3 will be moved back and forth.

As indicated in Fig. 9 the hook 4^f engages a rim-cam 5^a on the upper end of a rod 5^f journaled in eyes 2^h, 2^i, projecting from head 2, and provided with a handle 5^g by which it can be turned. The hook end 4^f of the rod engaging the cam-flange (5^a or 5^d) insures the positive movement of the jaw in both directions, and the pivot of the cam is directly opposite and in line with the slide-rod 4^e, so that the cam will always lock the jaw in any adjusted position. The clamping-bar 1 is preferably formed with longitudinal grooves in its sides, the upper and lower walls of such grooves being preferably inclined, as indicated at 1^a and 1^b, so that the grooves are approximately V-shaped in cross section. The object of these grooves is hereinafter explained. On the bar 1 is mounted a slide 6, which carries the tiltable or swinging jaw 7. Said slide has an opening in its lower portion to fit the bar 1, said opening being provided on its opposite sides and inner faces with inwardly projecting clamping lugs 6^a whose upper and lower edges are inclined to correspond with the opposed upper and lower walls of the grooves in bar 1, and being slightly smaller in cross section than such grooves. By reason of this construction if the upper part of the slide be pushed backward, as by pressure on the jaw 7, the forward upper edges of the clamp-lugs 6^a will engage the upper inclined walls 1^b of the grooves in the bar, while the rear lower edges of the clamp-lugs 6^a will engage the lower inclined walls 1^b of the grooves, and thus will positively clamp or hold the slide against rearward movement on the bar. If the slide be tilted slightly upward and forward toward the movable jaw, the clamp-lugs will be released, so that the slide when thus tilted can be easily adjusted on the bar. To permit this tilting of the slide the upper end of the opening in the slide may be slightly recessed at the forward side as shown at 6^b, and the lower end of the slot in the slide may be slightly tapered at the rear side as at 6^c. A spring 6^d is attached to the slide within the slot and above the bar, as shown in Figs. 1 and 2, and normally tends to rock the upper end of the slide away from the movable jaw, and thus cause the clamping-lugs 6^a to engage the inclines 1^a, 1^b, and hold the slide in adjusted position. On the upper part of the slide are ears 6^g between which is pivoted the web 7^a of the tilting or swinging jaw 7, by means of a bolt 6^h. The face of the jaw 7 corresponds preferably in size and width with the face of the movable jaw 3 to which it is opposed. The web 7^a of the swinging jaw moves between the ears 6^g and past a setting bolt 8 tapped through the upper part of the slide 6, and adapted to engage the web 7^a and lock the swinging jaw to any desired angle or inclination to which it is adjusted—or by loosening screw 8 the swinging jaw will automatically adjust itself to an object interposed between the jaws.

The clamping bar 1 may be formed of wood, or of metal as desired, and the precise size of the grooves, and the inclinations of the upper and lower walls thereof varied; but the upper and lower walls of the clamp-lugs 6^a should be correspondingly altered to conform to the grooves.

By having the movable jaw 3 move parallel to the plane of the bar 1, and having the swinging jaw 7 attached to the adjustable slide, the jaws will have an equal pressure applied between them throughout their entire surfaces, whether they are engaging square or inclined surfaced work; the parallel movement of the jaw 3 is particularly useful on clamps having long jaws, as the movable jaw has very little friction to overcome and can be made of light weight and yet be very strong and powerful. The parallel movement is equally well adapted to short jaw clamps, and particularly to cabinet-makers clamps, and such clamps will clamp material between any point of the inner surface of the jaws either close to or remote from the bar 1, and either perpendicular or inclined to the clamping-faces, and the material clamped by such vise will be held securely. The swinging jaw may be permitted to automatically adjust itself to the work or may be rigidly held at any adjusted inclination independent of the movable jaw, and yet the work will be pressed in a plane parallel with the clamping bar. The swinging jaw may be set inclined to the work and rigidly held in such adjusted position on the slide by means of the set screw 8 or equivalent devices, and in such position the inclined jaw will resist the parallel pressure at any point of its surface in the same manner that it would do so if the tilting jaw was integral with its supporting slide.

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

1. In a clamp-vise, the combination of a clamping-bar, a jaw slidably mounted thereon, a head on one end of the bar, a movable jaw adjustably mounted on said head, means for moving said jaw relatively to the head,

and X-links connecting the jaw and head for causing the jaw to move parallel with the bar.

2. In a clamp-vise, the combination of a clamping-bar, a slide thereon, a tilting or swinging-jaw pivotally mounted on the slide, a head on one end of the bar, a movable jaw adjustably mounted on said head, means for moving said jaw relatively to the head, and X-links pivotally connected to the jaw and head and adapted to cause the jaw to move parallel with the bar and maintain a position perpendicular thereto.

3. In a clamp-vise, the combination of a clamping-bar, a slide thereon, a tilting jaw pivoted on the slide, means for locking the tilting jaw in adjusted position on the slide; with a movable jaw, a support for said jaw fixed to the bar, means for moving said movable jaw longitudinally of the bar and X-links pivotally connected to the jaw and support at opposite sides of the jaw for keeping it perpendicular to the bar.

4. In a clamp-vise, the combination of a clamping-bar, a head on one end thereof, a movable jaw supported on said head, and means for adjusting the movable jaw; with a slide adjustable on the bar and provided with upstanding ears, a tilting jaw having a projecting web pivoted between the ears, and a setting-bolt tapped through the slide and adapted to engage the web to lock the tilting jaw in adjusted position on the slide.

5. In a clamp-vise, the combination of a clamping-bar having longitudinal grooves in its sides, a head on one end of the bar, a movable jaw, devices on said head for adjusting the movable jaw, means connected to the head and movable jaw for causing it to maintain a position perpendicular to the bar; with a slide mounted on the bar having an opening for the passage of the bar and provided with lugs shaped to correspond with and engage the grooves in the bar, a spring in the upper side of the slot for holding the sleeve in locked position on the clamping-bar, a tilting jaw pivotally mounted on said slide opposite the movable jaw, and means for locking the tilting jaw on the slide.

6. In a clamp-vise, the combination of a clamping-bar having approximately V-shaped longitudinal grooves in its sides, a head on one end of the bar, a movable jaw, adjusting devices on said head for adjusting the movable jaw, and X-links connected to the head and movable jaw for holding the latter parallel with the head; with a slide mounted on the bar having an opening for the passage of the bar and provided with lugs approximately V-shaped to correspond with and engage the grooves in the bar, a spring in the upper side of the slot for holding the sleeve in locked position on the clamping-bar, a tilting jaw pivotally mounted on said slide opposite the movable jaw, and means— a screw—for locking the tilting jaw on the slide.

7. In a clamp-vise, the combination of a clamping-bar, a slide adjustably mounted thereon, a tilting jaw swingable in a vertical plane and pivoted on the slide and adjustable therewith, means for locking the tilting jaw in adjusted position on the slide, and means for locking the slide in adjusted position on the bar; with a movable jaw, a support for said jaw fixed to the bar, means for moving said movable jaw relatively to the support and longitudinally of the bar, and means for keeping said movable jaw perpendicular to the bar.

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

PETER BROADBOOKS.

Witnesses:
EARL B. PERRY,
FLORA B. WEED.