

J. J. DIX & L. W. VAN CLEAVE.

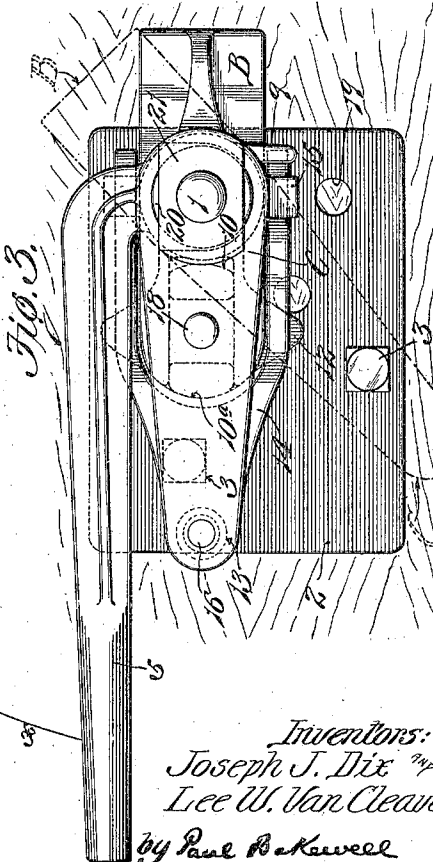
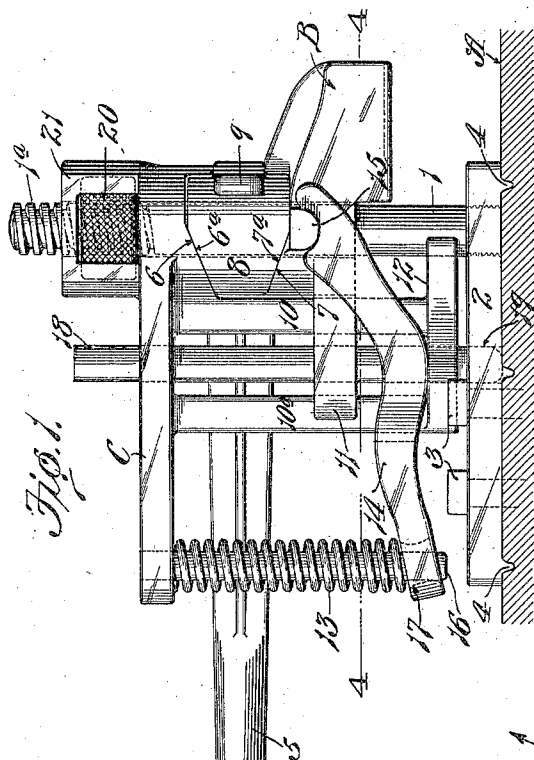
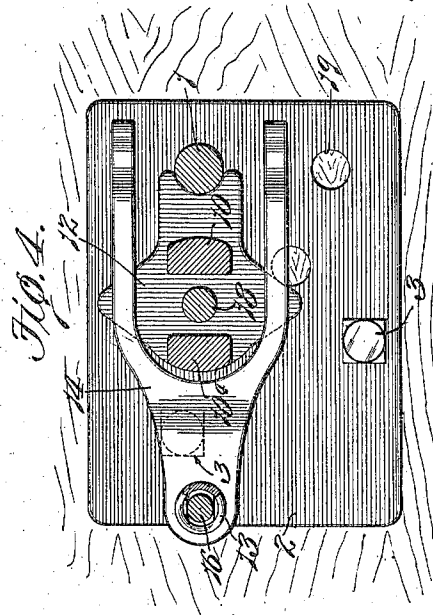
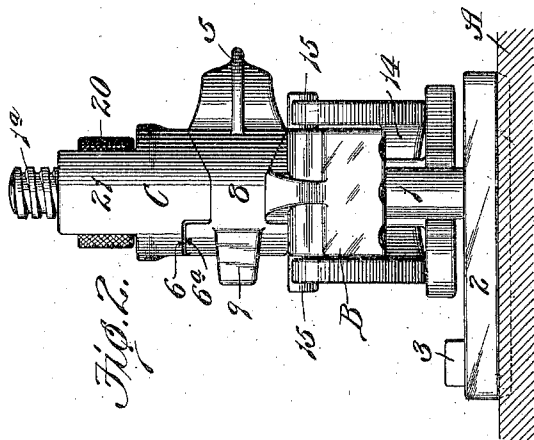
WISE.

APPLICATION FILED MAY 19, 1909.

947,888.

Patented Feb. 1, 1910.

2 SHEETS—SHEET 1.



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J. J. DIX & L. W. VAN CLEAVE.

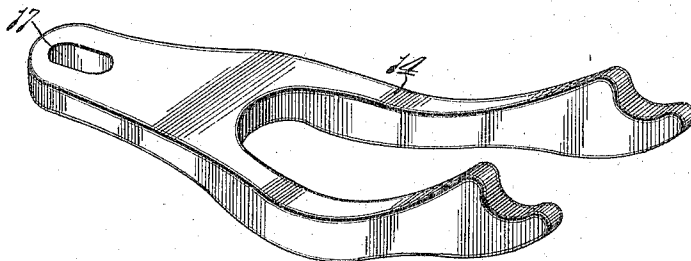
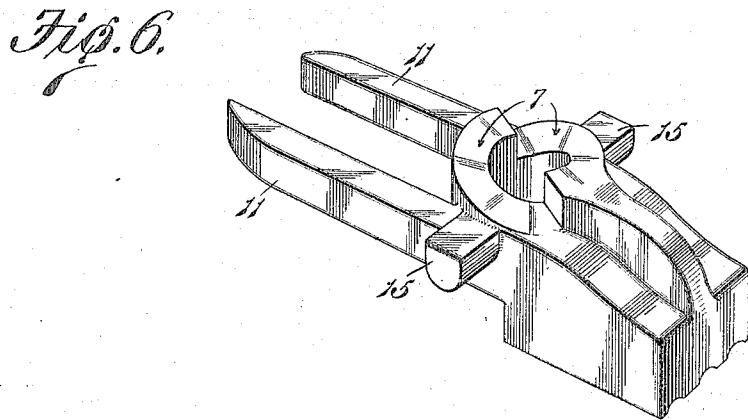
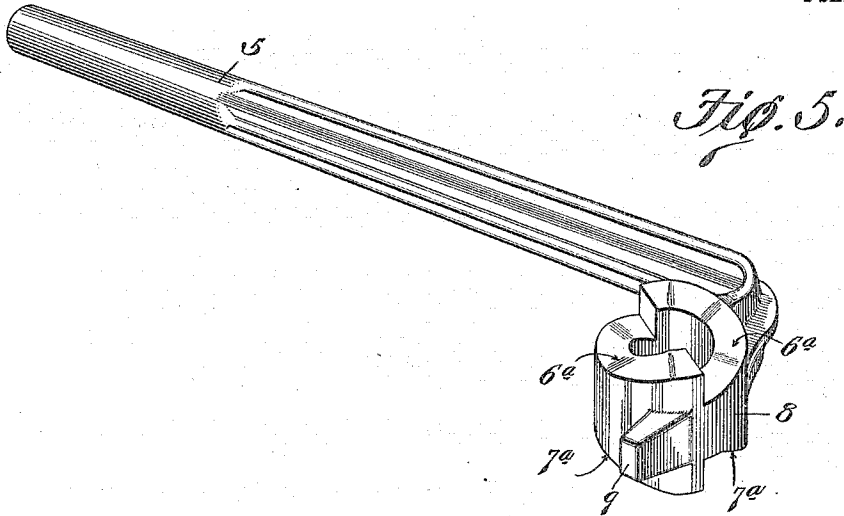
WISE.

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2 SHEETS—SHEET 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOSEPH J. DIX AND LEE W. VAN CLEAVE, OF ST. LOUIS, MISSOURI.

VICE.

947,888.

Specification of Letters Patent.

Patented Feb. 1, 1910.

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To all whom it may concern:

Be it known that we, JOSEPH J. DIX and LEE W. VAN CLEAVE, both citizens of the United States, residing at St. Louis, Missouri, have invented certain new and useful Improvements in Vises, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to vises or clamping devices, and particularly to that type in which the movable jaw can be moved into and out of clamping position quickly.

One object of our invention is to provide a quick-acting clamping device which is so constructed that the clamping jaw will not be liable to tilt or move out of a plane parallel to the member with which it coöperates when it is moved into clamping position.

Another object of our invention is to provide a quick-acting clamping device that comprises means for adjusting the movable jaw relatively to the stationary member with which it coöperates, and independent means for moving said movable jaw into and out of clamping position.

Another object of our invention is to provide a clamping device which is so constructed that the clamping jaw can be turned or adjusted in the arc of a circle, thus enabling it to be arranged in various positions. And still another object of our invention is to provide a quick-acting clamping device of simple construction that is strong and which comprises few parts.

Other objects and desirable features of our invention will be hereinafter pointed out.

Figure 1 of the drawings is a side elevational view of our improved vise or clamping device; Fig. 2 is a front elevational view of same; Fig. 3 is a top plan view of said device; Fig. 4 is a horizontal sectional view taken on approximately the line 4—4 of Fig. 1; Fig. 5 is a perspective view of the lever that actuates the clamping jaw; Fig. 6 is a perspective view of said jaw; and Fig. 7 is a perspective view of the yoke-shaped member that forms part of the means for moving the clamping jaw away from the stationary clamping member with which it coöperates.

Referring to the drawings which illus-

trate the preferred form of our invention, 1 designates a stationary spindle that projects upwardly from a stationary support A with which the movable clamping jaw B coöperates to hold an object or piece of material which it is desired to clamp in a certain position. We have herein shown the spindle 1 as being secured to a base plate 2 that is detachably connected to the stationary support A by means of fastening devices 3, said base plate being provided on its under side with ribs 4, as shown in Fig. 1, that project into grooves in the upper surface of the support A so as to reduce the liability of the base plate moving relatively to the support.

Our improved clamping device can be used for various classes of work, such, for example, as clamping an object to a workbench or to the bed plate of a machine, and while we have herein shown the spindle 1 carried by a base plate that is detachably connected to a bench or bed plate A we do not wish it to be understood that our broad idea is limited to such a construction for it is immaterial whether the spindle is connected directly to the support A or to a separate plate or member that is detachably connected to said support.

While we have herein shown our improved clamping device mounted upon a horizontally disposed support A it will, of course, be understood that it could be used equally well with a vertically disposed support.

The clamping jaw B is reciprocatingly mounted on the spindle 1, and a lever 5 is provided for moving the jaw B toward the support A so as to securely clamp the object in position. A frame C, through which the upper end of the spindle passes, is provided with a double cam face 6 that is located in vertical alinement with a double cam face 7 on the upper side of the movable jaw or clamping member B, and the lever 5 is provided at its inner end with a collar 8 rotatably mounted on the spindle and arranged between the clamping jaw B and the portion of the frame C through which the spindle passes. This collar 8 is provided on its upper and lower sides with two double cam faces 6^a and 7^a that coöperate with the cam faces 6 and 7 on the frame C and jaw B, respectively, the cam faces 6 and 6^a inclining in an opposite direction to the cam faces

7 and 7^a so that the jaw B will be depressed or moved toward the support A when the lever 5 is rotated about the spindle 1 in the direction indicated by the arrow *x* in Fig. 3. By providing the collar 8 on the lever 5 with double cam faces on its upper and lower sides, as shown in Fig. 5, we obtain an actuating member which consists practically of two semi-circular-shaped wedges that pass between converging surfaces on the frame C and the clamping jaw B when the lever 5 is rotated forwardly, thus positively forcing the jaw B downwardly or toward the support A. These two wedges on the collar 8 and the cooperating inclined surfaces on the jaw B are so arranged that the downward pressure on the jaw B will be distributed equally on opposite sides of the spindle 1. Consequently, there will be no tendency for the jaw B to tilt out of a horizontal plane or bind on the spindle 1 when said jaw is being moved into clamping position for the downward pressure that is exerted on that portion of the jaw at the front of the spindle 1 is the same as the downward pressure on that portion of the jaw at the rear of said spindle. The lever 5 is preferably so formed that it lies comparatively close to the frame C when the clamping jaw is in its elevated position, and when the lever is actuated to depress said jaw a stop 9 on the collar 8 engages a vertical guide 10 on the frame C so as to limit the movement of said lever. The jaw B is prevented from turning by means of arms 11 on the rear end thereof that embrace the vertical guide 10 on the frame C and also a corresponding guide 10^a on said frame, the lower ends of said vertical guides 10 and 10^a being connected together by a portion 12 which partially embraces the spindle 1 so as to form a brace or guide that prevents the frame C from sagging or binding on the spindle.

When the lever 5 is rotated rearwardly slightly or in an opposite direction to that indicated by the arrow *x* in Fig. 3 so as to release the jaw B, said jaw is moved upwardly by means of a spring 13 that actuates a yoke-shaped member 4 that projects underneath laterally projecting lugs 15 on the jaw B. This yoke-shaped member 14 is curved intermediate its ends so that it will rock upon the portion 12 that connects the lower ends of the guides 10 and 10^a together, said yoke-shaped member being provided at its front end with curved recesses that receive the laterally projecting lugs 15 on the clamping jaw. The spring 13 is interposed between an extension on frame C and the rear end or tail end of the yoke-shaped member 14 so as to exert downward pressure on the rear end of said member and thus cause it to move the jaw B upwardly as soon as said jaw has been re-

leased. The spring 13 herein shown consists of a coiled expansion spring that surrounds a vertically disposed guide 16 that passes through an opening 17 in the rear end of the yoke-shaped member but it will, of course, be obvious that a U-shaped flat spring or any other suitable kind of spring could be used for actuating the yoke-shaped member 14 without departing from the spirit of our invention.

The frame C is rotatably mounted on the spindle 1 so that it can be turned in the arc of a circle to arrange the clamping jaw in different positions, as indicated by the broken lines in Fig. 3, and means is provided for locking said frame in its adjusted position. In the construction herein shown said means consists of a movable pin 18 carried by the frame C and adapted to be forced downwardly into a hole or recess 19 in the base plate 2, said base plate being provided with several of such holes, as shown in Figs. 3 and 4, so as to enable the frame to be locked in various positions. The spindle 1 is provided at its upper end with a screw threaded portion 1^a on which a nut 20 is rotatably mounted, the frame C having a housing 21 inside of which said nut is arranged so that the frame C can be bodily adjusted relatively to the support A to vary the position of the clamping jaw relatively to said support. By adjusting the frame C in this manner we are enabled to vary the pressure which the clamping jaw exerts on the object being clamped and we are also able to set said jaw in such a position that the space between same and the support A can be varied to accommodate different sized articles.

A clamping device of this construction comprises few parts so that it is strong and can be manufactured at a low cost, the clamping jaw can be adjusted in the arc of a circle and it can also be adjusted relatively to the support with which it co-operates so as to vary the space between said support and jaw, and another very desirable feature of our improved device is that the pressure of the actuating member on the clamping jaw is distributed in such a manner that said jaw will remain parallel to the stationary member with which it co-operates and it will not bind on the spindle on which it moves.

While we prefer to construct the frame C so that it can be moved or adjusted in the arc of a circle, we do not wish it to be understood that our broad idea is limited to this exact construction for if desired the pin 18 could be securely connected to the base plate so as to merely form a guide for the frame C when it is being adjusted vertically. It is also immaterial, so far as our broad idea is concerned, whether or not the frame C is so constructed that it can be adjusted

vertically. We prefer, however, to construct said frame so that it can be adjusted vertically and also in the arc of a circle.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A clamping device provided with a movable jaw, a guiding member on which said jaw travels, an actuating member provided with a double cam face that coöperates with a double cam face on said jaw so as to move said jaw and exert uniform pressure on same when said actuating member is moved, and means comprising a rockable element for holding said jaw in an inoperative position.

2. A clamping device provided with a movable jaw, an adjustable frame on which said jaw is mounted, a cam-shaped member interposed between said jaw and a portion of said frame for moving said jaw, and a spring-actuated device coöperating with said jaw for normally holding it in an inoperative position.

3. A clamping device comprising a movable jaw, a frame, a rotatable actuating member having cam-shaped faces that coöperate with cam-shaped faces on said frame and jaw, and a yielding device that exerts pressure on said jaw when it is moving into clamping position.

4. A clamping device comprising a movable jaw, a frame, a rotatable actuating member interposed between said frame and jaw, double cam faces on opposite sides of said actuating member, coöperating double cam faces on said jaw and frame, a rockable element coöperating with said jaw, and a yielding device that exerts pressure on said rockable element.

5. A clamping device comprising a movable jaw, a guide on which said jaw is mounted, a rotatable actuating device mounted on said guide, coöperating inclined faces or cam faces on said jaw and actuating member, a lever arranged with one of its ends in engagement with said jaw, and a spring that exerts pressure on the opposite end of said lever when the jaw moves into clamping position.

6. In a clamping device, a movable jaw, a spindle on which said jaw is slidably mounted, an actuating member rotatably mounted on said spindle, a stationary part with which said actuating member coöperates, coöperating cam faces formed on said stationary part, on said actuating member, and on said jaw, and a spring-actuated device on which said jaw rests.

7. In a clamping device, a movable jaw, a guide on which said jaw is reciprocally mounted, a frame having a stationary portion arranged in alinement with said jaw, an actuating member rotatably mounted on said guide and interposed between said jaw

and frame, a supporting lever for said jaw that engages the jaw at a point adjacent to said guide, and a yielding means for exerting pressure on said lever.

8. In a clamping device, a movable jaw, a spindle on which said jaw is slidably mounted, a stationary part arranged in alinement with said jaw, an actuating member rotatably mounted on said spindle and interposed between said jaw and stationary part, said actuating member consisting of a plurality of semicircular-shaped wedges that coöperate with inclined surfaces on said jaw and stationary part, a lever bearing against said jaw, and a spring coöperating with said lever in such a manner that it is placed under tension when the jaw moves into clamping position.

9. A clamping device comprising a clamping jaw and a stationary jaw, a rotatable actuating member having a cam-shaped face that coöperates with a cam-shaped face on said jaw so as to cause said jaw to move toward the stationary jaw when said actuating member is turned, and a spring-actuated rockable element which normally supports said jaw and moves it in the opposite direction away from the stationary jaw.

10. A clamping device comprising a clamping jaw, a rotatable actuating member having a cam-shaped face that coöperates with a cam-shaped face on said jaw so as to cause said jaw to move in one direction when said actuating member is turned, independent means for moving said jaw in the opposite direction, said means consisting of a rocking member that engages said jaw, and a spring for exerting pressure on said rocking member.

11. A clamping device comprising a movable jaw, a frame, a guide on which said jaw is slidably mounted, a cam-shaped actuating member interposed between said jaw and frame and rotatably mounted on said guide, a rocking member carried by said frame and engaging said jaw for moving it in one direction, and an expansion spring for actuating said rocking member.

12. A clamping device comprising a clamping jaw, a guide on which said jaw is slidably mounted, a frame having a portion that projects over said jaw, coöperating means on said jaw and frame for preventing the jaw from turning, an actuating member rotatably mounted on said guide and arranged between said jaw and frame for depressing the jaw, a rocking member mounted on said frame and engaging lugs on said jaw, and a spring for exerting pressure on said rocking member in a direction to elevate said jaw.

13. A clamping device comprising a movable clamping jaw that is adapted to coöperate with a stationary support, means for bodily shifting said jaw to vary the nor-

mal position of same relatively to said support, a rotatable actuating member that bears directly against said jaw and moves it toward the support when it is turned in one direction, and yielding means for moving said jaw away from said support.

14. A clamping device comprising a movable jaw that is adapted to cooperate with a stationary support, a guide on which said jaw is slidingly mounted, a frame having a portion through which said guide passes, a cam-shaped actuating member rotatably mounted on said guide and arranged between said jaw and frame, and means for adjusting said frame relatively to the support with which the movable jaw cooperates.

15. A clamping device comprising a movable jaw that is adapted to cooperate with a stationary support, a guide on which said jaw is slidingly mounted, a frame having a portion through which said guide passes, a cam-shaped actuating member rotatably mounted on said guide and arranged between said jaw and frame, means for adjusting said frame relatively to the support with which the movable jaw cooperates, a rocking member carried by said frame and engaging said movable jaw, and a spring interposed between one end of said rocking member and said frame for moving said jaw away from said stationary support.

16. A clamping device comprising a spindle, a frame rotatably mounted on said spindle, a nut mounted on a screw-threaded portion on said spindle and engaging said frame for adjusting it relatively to the spindle, a clamping jaw mounted on said spindle and having arms that embrace guides on said frame, a lever having a collar rotatably mounted on said spindle and arranged between said frame and movable jaw, said collar being provided on its upper and lower sides with cam faces that cooperate with cam faces on the movable jaw and frame, a yoke-shaped member oscillatingly mounted on said frame and engaging laterally projecting lugs on the movable jaw, a spring interposed between the frame and the tail end of said yoke-shaped member for exerting upward pressure on the movable jaw, said frame being adapted to be moved in an arc of a circle to vary the position of said clamping jaw, and a device carried by said frame for locking it in adjusted position.

In testimony whereof, we hereunto affix our signatures, in the presence of two witnesses, this 17th day of May, 1909.

JOSEPH J. DIX.

LEE W. VAN CLEAVE.

Witnesses:

WELLS L. CHURCH,
GEORGE BAKEWELL.