(No Model.) 2 Sheets—Sheet 1.

D. C. & J. SABOURIN.

VISE.

No. 464,523. Patented Dec. 8, 1891.

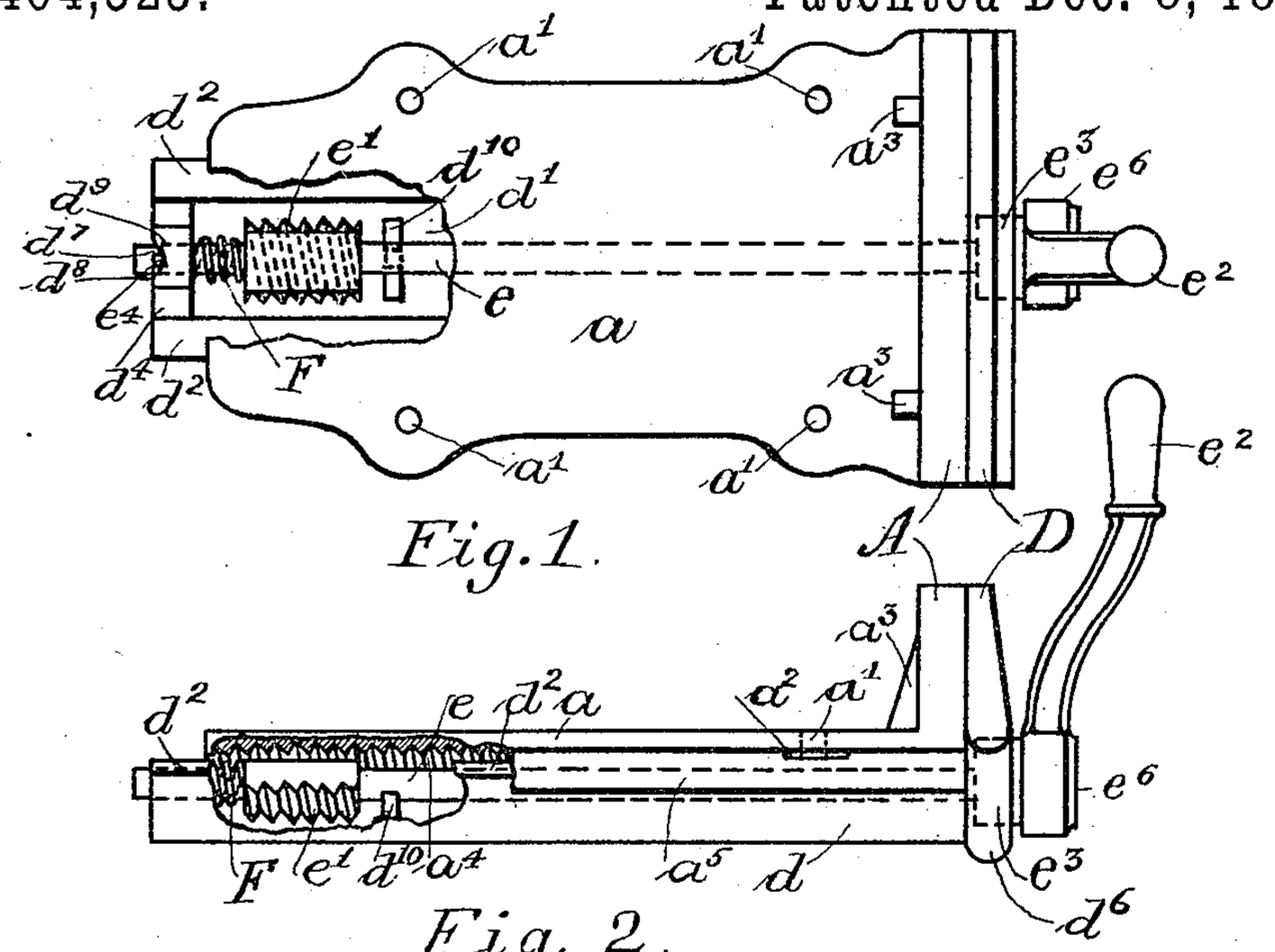

Fig. 1.

Fig. 2.

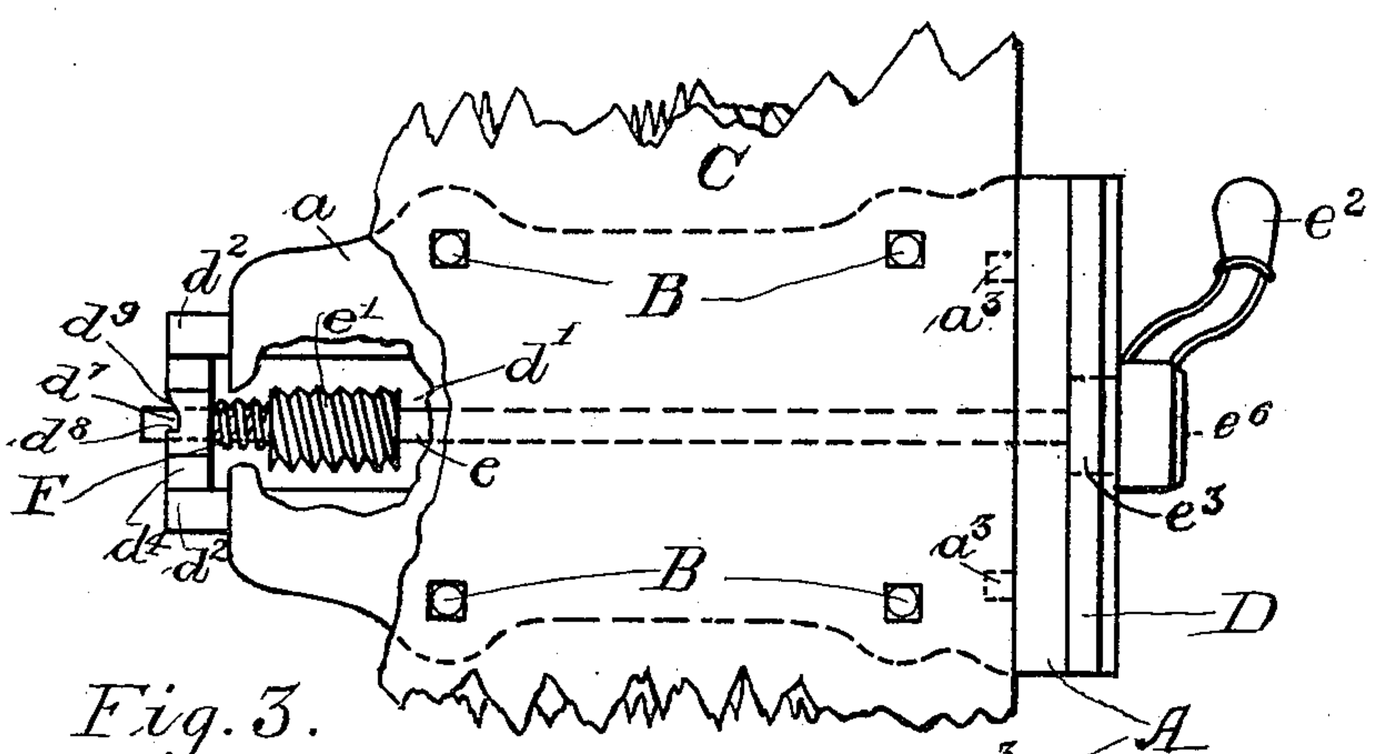

Fig. 3.

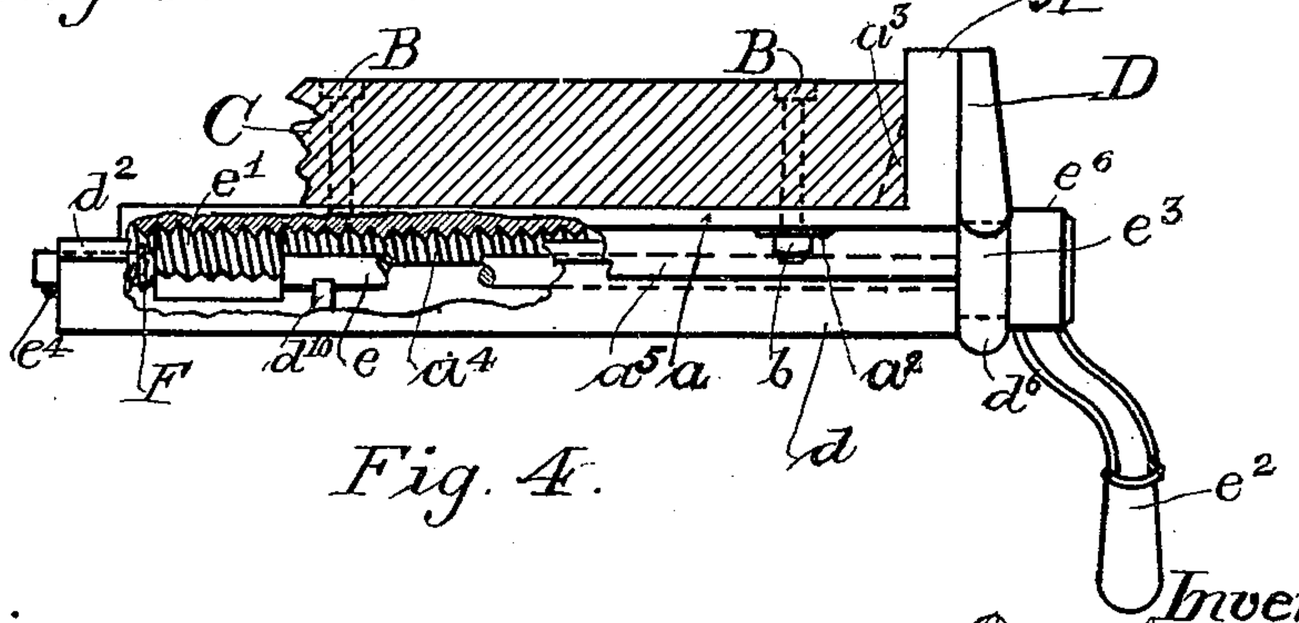

Fig. 4.

Witnesses.

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Their Attorney

(No Model.) 2 Sheets—Sheet 2.

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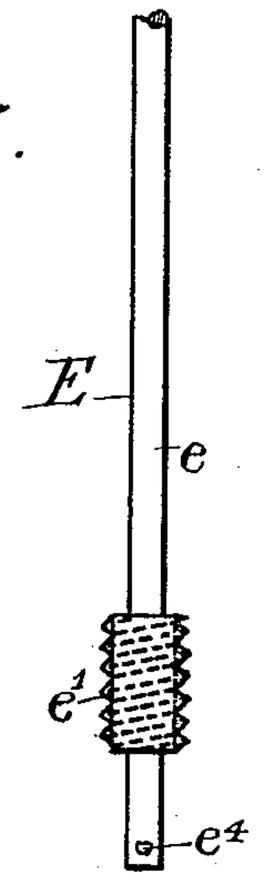
Fig. 5.



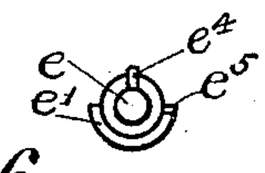


Fig. 6.

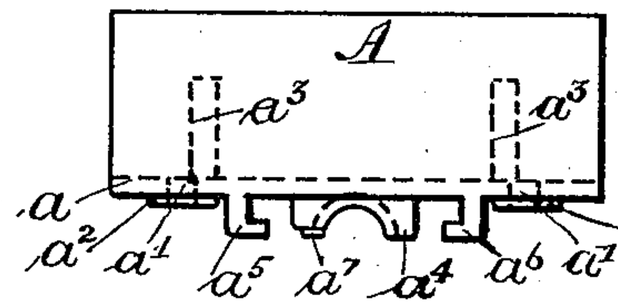


Fig. 7.

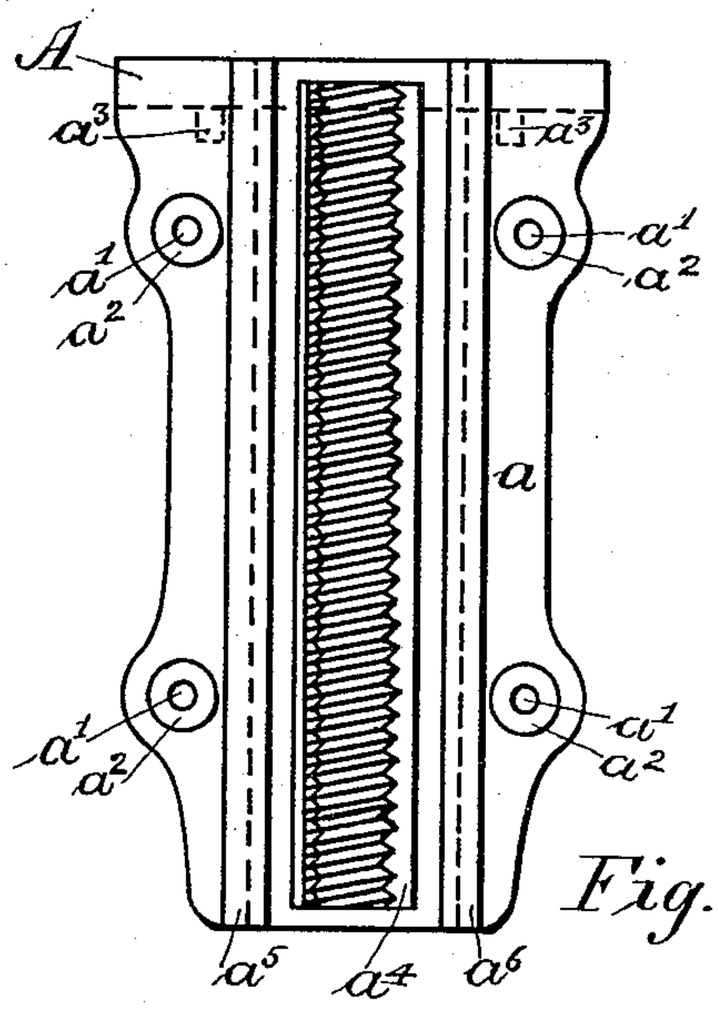


Fig. 8.

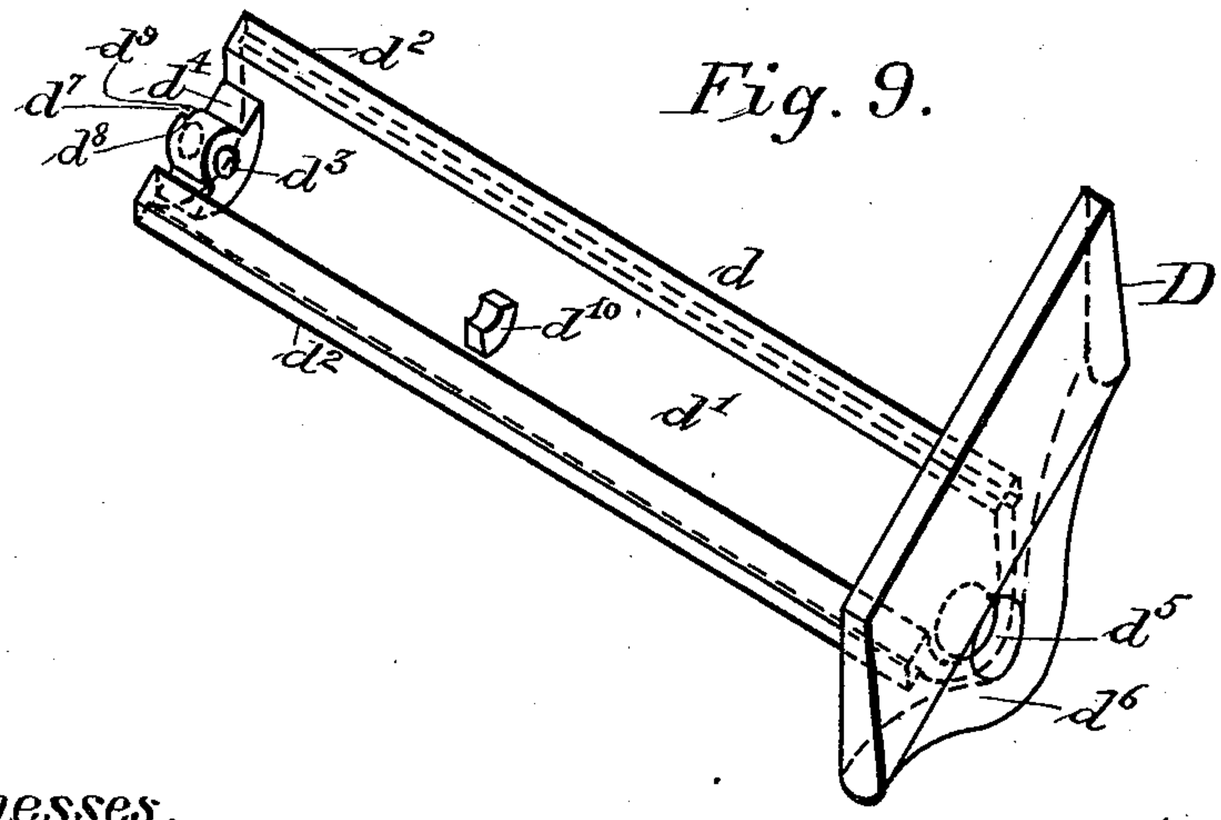


Fig. 9.

Witnesses.

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UNITED STATES PATENT OFFICE.

DAVID C. SABOURIN AND JOSEPH SABOURIN, OF LOWELL, MASSACHUSETTS.

VISE.

SPECIFICATION forming part of Letters Patent No. 464,523, dated December 8, 1891.

Application filed April 25, 1891. Serial No. 390,483. (No model.)

To all whom it may concern:

Be it known that we, DAVID C. SABOURIN and JOSEPH SABOURIN, both citizens of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Vises, of which the following is a specification.

Our invention relates to vises; and it consists in the devices and combinations hereinafter described and claimed.

In the accompanying drawings, on two sheets, Figure 1 is a plan of a vise provided with our improvement, a part of the attaching-plate of the vise being broken away to show the screw, spring, stop, and bearing of the screw; Fig. 2, a side elevation of the same, a part of the attaching-plate being broken away to show the nut and a part of the slide being broken away to show the screw, spring, and bearing for the screw, the screw and nut being disengaged in each of said figures; Fig. 3, a plan of a part of a bench or table, a vise bolted thereto, a part of the attaching-plate being broken away to show the screw and spring; Fig. 4, a side elevation of said vise, a portion of the bench to which the vise is attached being in vertical section and a part of the slide and attaching-plate being broken away to show the nut, screw, spring, and screw-bearing, the screw being represented in Figs. 3 and 4 as turned into a position to engage the nut; Fig. 5, a plan of the screw, its rod, omitting a part thereof near the handle, and the stop-pin; Fig. 6, a rear end elevation of the parts shown in Fig. 5; Fig. 7, a front elevation of the upper jaw, its attaching-plate, the nut, and the ways which support the slide; Fig. 8, a plan of the bottom of the parts shown in Fig. 7; Fig. 9, an isometric perspective view of the lower or movable jaw, its slide, and the bearings of the screw or screw-rod.

The improvement herein described is represented in the drawings as embodied in a vise for wood-workers, as pattern-makers, cabinet-makers, and wood-carvers, but is equally applicable to a machinist's vise. The fixed jaw A of the vise shown is cast in one piece with or otherwise rigidly secured to an attaching-plate a, said attaching-plate having holes a', through which bolts B are passed to secure said plate, with the aid of nuts b, to a table or bench C, said holes being preferably surrounded on the under side of said plate by annular bosses a^2 to strengthen said plate. To secure the jaw A more firmly to the attaching-plate a, braces a^3 connect said jaw and plate, being cast in one piece therewith, and said braces, being let into suitable recesses in the front of the bench C, likewise assist in preventing any lateral movement of said jaw and plate. On the bottom of the attaching-plate a is cast or otherwise secured a half-nut a^4, extending nearly from end to end of said plate, and L-shaped ways a^5 a^6 to support the slide d, described below.

The movable jaw D is cast in one piece with the slide d, said slide being trough-shaped or concave at d' on its upper surface and provided with parallel longitudinal flanges d^2 at each side at the top of the same, said flanges having a sliding fit between the vertical parts of the ways a^5 a^6 and between the horizontal parts of said ways and the bottom of the attaching-plate a.

The screw E consists of a rod e, preferably of steel or wrought-iron, on which the screw proper e' and the handle or lever e^2 and its hub e^3 are cast in a mold or otherwise secured. The rear journal of the screw-rod e turns in a hole d^3 in the rear end wall d^4 of the slide d and the periphery of the cylindrical hub e^3 of the handle e^2, which hub has a larger radius than the screw proper e', serves as the front journal of said screw-rod, and turns in a round hole d^5 in the front end wall d^6 or downward extension of the movable jaw D. To save stock and make the vise less cumbersome, the screw-rod e may be made of less diameter without depriving it of sufficient stiffness to hold its screw e' in engagement with the nut a^4 by supporting said screw-rod in a half journal-box d^{10}, cast in the concavity d' of the slide and arranged near the front end of said screw proper e'. The screw proper e' is, in effect, only a segment of a screw, just as the nut a^4 is a segment of a nut, the thread of the screw running only half-way around the body of the screw, and the unthreaded portion of said screw serving merely to embrace the screw-rod and having a radius less than the radius of the threaded part of said screw by at least the depth of the screw-thread. The screw-threaded portion of the

screw e' and the screw-rod e are parallel with the nut a^4 and at such a distance therefrom that when said rod is turned sufficiently to bring the threaded surface of the screw e' uppermost said screw will be in engagement with said nut and will cause the movable jaw D and its slide d, said screw-rod, and screw to move longitudinally. When the unthreaded surface of the screw e' is uppermost, the movable jaw D and the parts which move with it may be moved longitudinally by hand to vary the distance between the jaws, so that said movable jaw may be forced by hand against work placed between the jaws by grasping the handle or lever e^2, and then by turning said handle in the proper direction the work will be clamped securely.

The wall d^4, which serves as the rear journal-box of the screw-rod, is provided with a stop-notch d^7 to receive a pin e^4, which projects radially from the screw-rod e and is normally in contact with the rear surface of said wall d^4, but is forced into said notch d^7 by a spring, (represented as a spiral spring F, surrounding said screw-rod and compressed between said wall d^4 and the screw proper e',) when said screw-rod is turned into a position to disengage said screw e' and the nut a^4 from each other, said notch being of a shape to prevent the further rotation of said screw the instant such disengagement takes place, said notch being represented as having one side d^8 parallel with the axis of the screw-rod e, and having the other side d^9 thereof inclined to said axis at such an angle that the pin readily slides thereon when said screw-rod is turned to close the vise.

The pitch of the screw e' and nut a^4 is steep, preferably about one-fourth of an inch, and the engaging ends of the threads of each, in order that they may engage each other more readily, are beveled or narrowed, as shown at e^5 and a^7, Figs. 6 and 7, on the rear surfaces of the threads of the nut and on the front surfaces of the threads of the screw; or, in other words, the pitch of the threads at the engaging points of the threads is greater than the general pitch of the threads, so that at the initial engagement of the nut and screw the screw could only with great difficulty, if at all, move the slide and movable jaw D against the resistance of the piece to be clamped by the jaws; but the spring F holds the handle out of contact with the front face of said movable jaw, as shown in Figs. 1 and 2, when the screw and nut are out of engagement, and the first work required of said screw and nut after their engagement is the comparatively easy task of compressing said spring sufficiently to bring said handle or the enlargement e^6 of its hub e^5 against said movable jaw, which being accomplished the working surfaces of the threads of said screw and nut are in contact, and the further rotation of the screw clamps the work.

The pin e^4, notch d^7, and handle e^2 are preferably so arranged with reference to each other and the screw proper e' that when the nut a^4 and said screw are not in engagement with each other the handle is in a vertical position, as shown in Figs. 1 and 2, so that in the act of clamping the stock the handle is turned down out of the way of the operator into the position shown in Figs. 3 and 4.

Although the segmental screw e' is represented as about a half of a screw and the nut is represented as about half of a nut, it is obvious that the threads of either of these parts may extend through any number of degrees of angular measurement, provided that the sum of the angular distances measured by the threads of both of said parts is less than three hundred and sixty degrees—in practice enough less to allow the unthreaded portion of the screw e' to clear easily the threads of the nut a^4 when the movable jaw is being moved in or out by hand.

The above-described vise may be made almost wholly in the foundry with very little finishing, and when completed consists of only three absolutely essential pieces, the jaw-pieces and the screw, the screw being introduced to the slide through the hole d^5 and dropped behind the half journal-box d^{10} and pushed backward until the rear end of the screw-rod e enters the hole d^3, the spring and stop-pin, although highly useful, being added for convenience and to save time in engaging the threads of the screw and nut rather than from necessity.

We claim as our invention—

1. The combination of the fixed jaw and fixed segmental nut with the movable jaw and a segmental screw supported thereon and adapted to be rotated in one direction to engage said nut and to be rotated in the other direction out of engagement with said nut, as and for the purpose specified.

2. The combination of the fixed jaw and fixed segmental nut with the movable jaw and a segmental screw supported thereon and adapted to be rotated in one direction to engage said nut and to be rotated in the other direction out of engagement with said nut, the combined angles measured by the threaded portions of said nut and screw being less than three hundred and sixty degrees, as and for the purpose specified.

3. The combination of the fixed jaw, the fixed segmental nut, the movable jaw, the slide secured to said movable jaw, the segmental screw turning in said slide and movable longitudinally therein, the engaging ends of the threads of said screw and nut being beveled or narrowed the more readily to engage with each other, and a spring arranged to move said screw forward in said slide when said screw and nut are disengaged and adapted to yield to allow a backward movement of said screw in said slide when said beveled end portions of said threads are in contact with and passing each other, as and for the purpose specified.

4. The combination of the fixed jaw, the

fixed segmental nut, the stationary ways, the movable jaw, the slide secured to said movable jaw and supported on said ways, the segmental screw turning in said slide and movable longitudinally therein, a stop-pin projecting from said screw, and a spring arranged to move said screw longitudinally to cause said pin to engage a notch, with which said slide is provided, when said screw is out of engagement with said nut, as and for the purpose specified.

5. The combination of the fixed jaw, the segmental nut secured to said fixed jaw, the movable jaw, the slide secured thereto, the screw-rod journaled in said slide, the segmental screw carried by said rod, and the handle secured to said screw-rod and having a hub larger than the diameter of said screw, said hub serving as one of the journals of said screw-rod and being adapted to enter and fit a hole with which said slide is provided, as and for the purpose specified.

6. The combination of the fixed jaw, the segmental nut secured to said fixed jaw, the movable jaw, the slide secured thereto, the screw-rod journaled in said slide, the segmental screw carried by said rod, the handle secured to said screw-rod and having a hub larger than the diameter of said screw, said hub serving as one of the journals of said screw-rod and being adapted to enter and fit a hole with which said slide is provided, and a half journal-box secured in said slide in front of said screw, as and for the purpose specified.

In witness whereof we have signed this specification, in the presence of two attesting witnesses, this 21st day of April, A. D. 1891.

DAVID C. SABOURIN.
JOSEPH SABOURIN.

Witnesses:
ALBERT M. MOORE,
JOSEPH W. PIPER.