

C. S. EVANS.

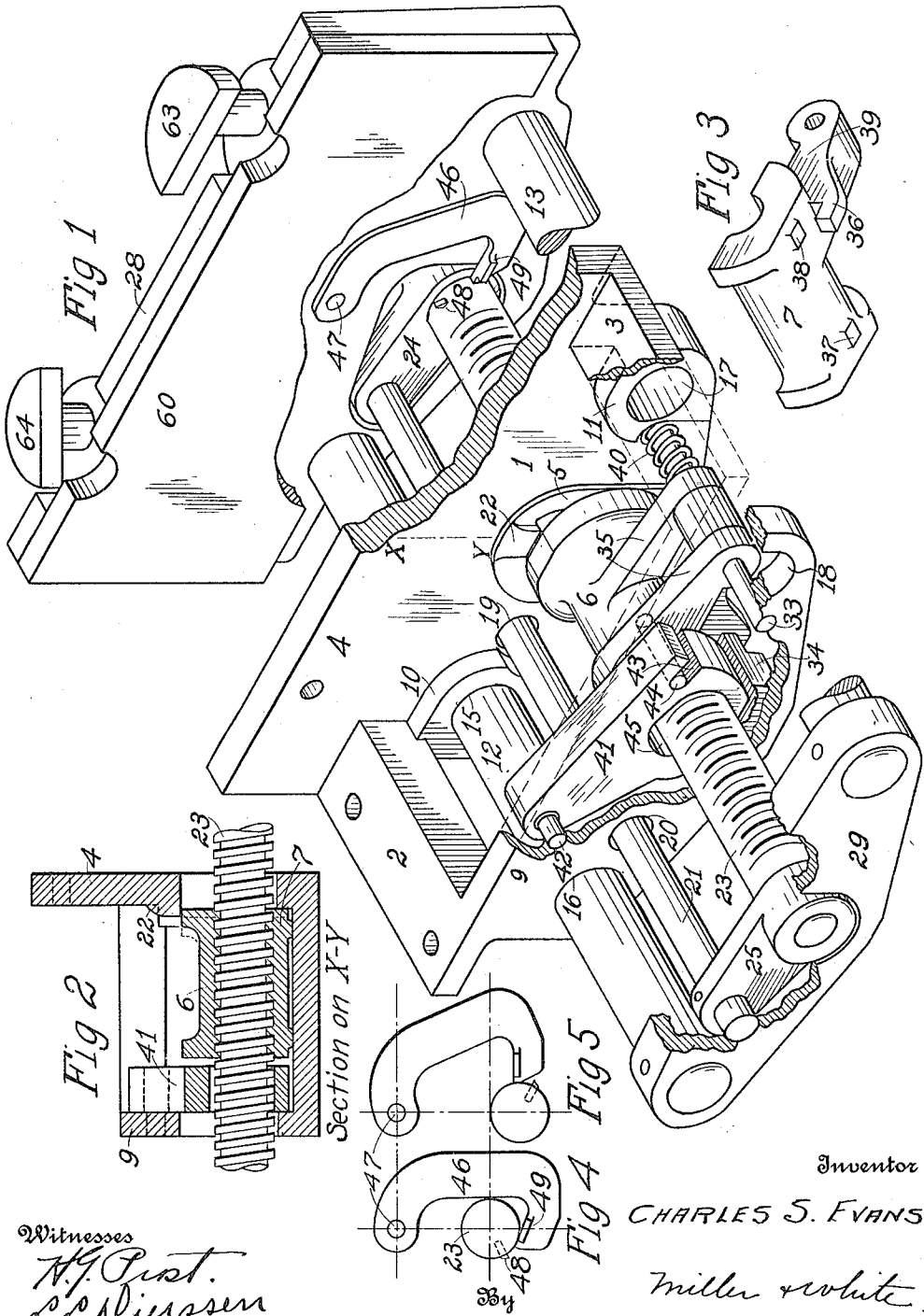
WISE,

APPLICATION FILED OCT. 28, 1911.

1,141,237.

Patented June 1, 1915.

3 SHEETS—SHEET 1.



Witnesses
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 VISE.
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 3 SHEETS—SHEET 2.

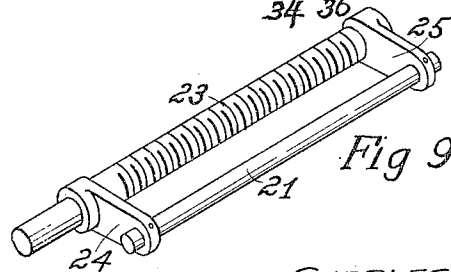
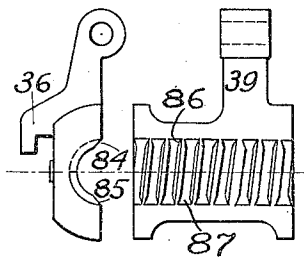
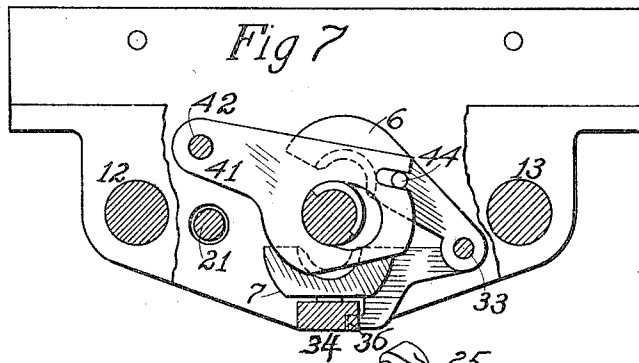
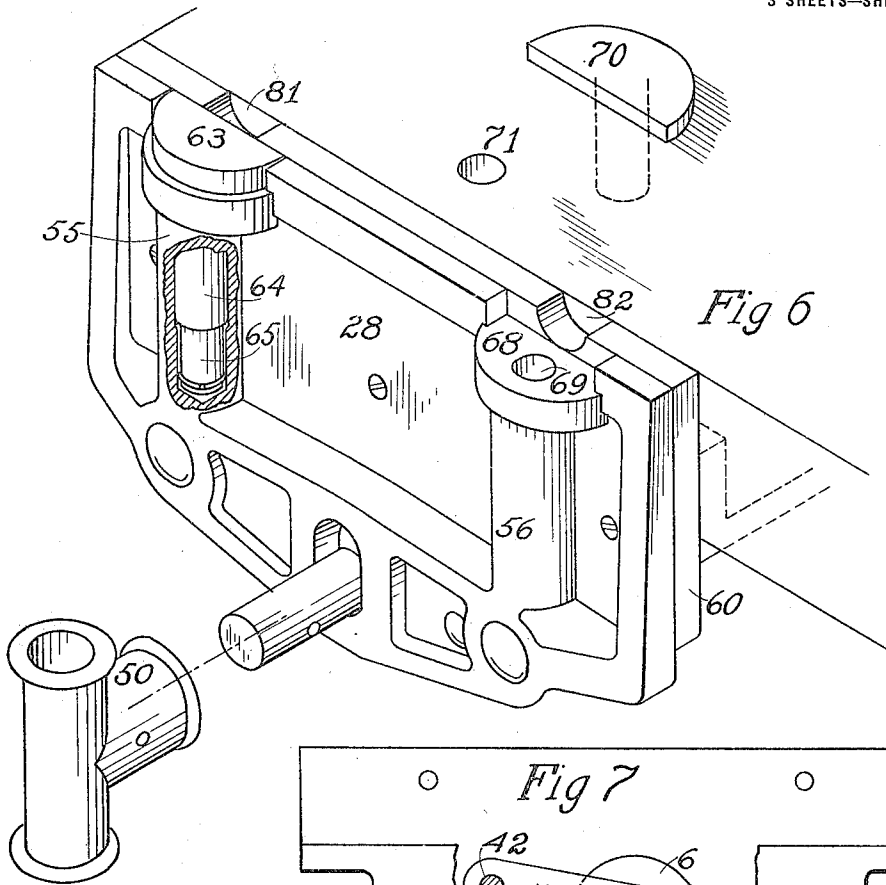


Fig 8

Fig 9

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3 SHEETS—SHEET 3.

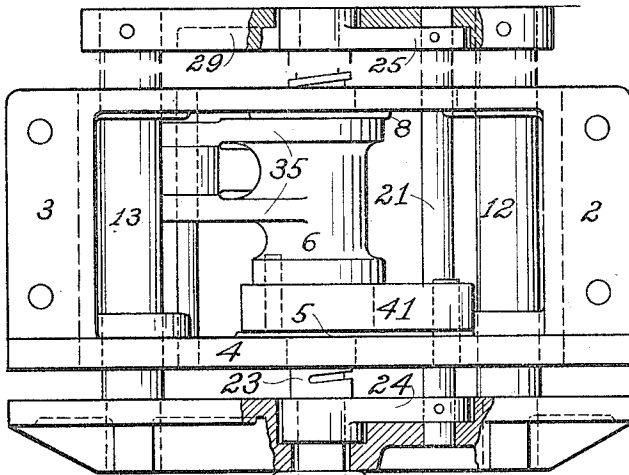


Fig 10

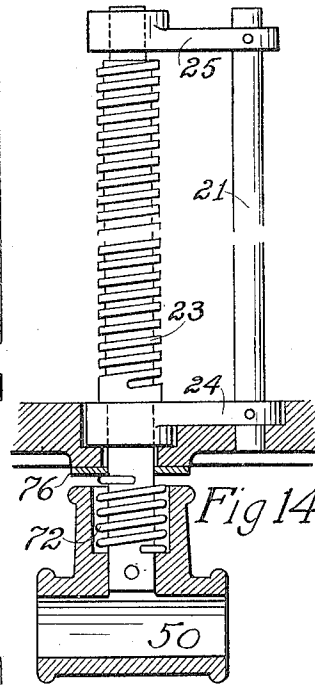
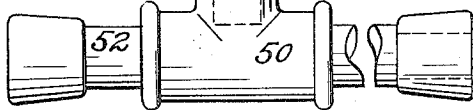


Fig 14

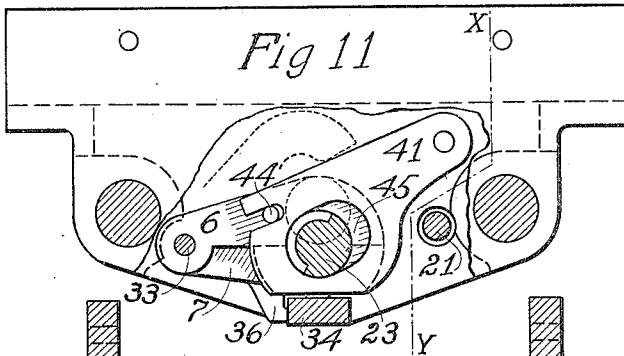


Fig 11

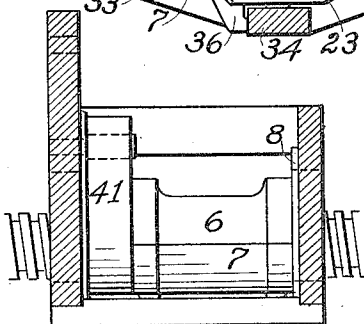


Fig 12

Sections on X-Y

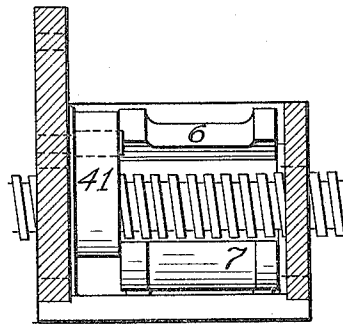


Fig 13

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CHARLES SUMNER EVANS, OF BERKELEY, CALIFORNIA.

VICE.

1,141,237.

Specification of Letters Patent.

Patented June 1, 1915.

Application filed October 28, 1911. Serial No. 657,211.

To all whom it may concern:

Be it known that I, CHARLES SUMNER EVANS, a citizen of the United States, and a resident of Berkeley, county of Alameda, and State of California, have invented certain new and useful Improvements in Vises, of which the following is a specification.

The invention relates to vises which are used by mechanics and wood workers for holding the work to be operated upon and particularly to that class of vises known as quick acting vises.

The object of the invention is to provide a quick acting vise, in which the engagement or disengagement of the screw with the nut is positive in action and which does not depend upon mutilated threads or frictional contacts to engage or disengage the screw and nut.

Another object of the invention is to provide a vise in which the object between the jaws is held in a cushion grip immediately before and after the full power of the screw is exerted.

Another object of the invention is to provide a vise which combines with a continuous screw action in either direction, a quick adjustment of the movable jaw at any point in the turn of the screw.

A further object of the invention is to provide a quick acting vise which is simple in construction, and efficient in operation and which is composed of few parts of great durability.

Another object of the invention is to provide an arrangement of work-holding dogs, which permits large pieces of work to be held by the vise.

The vise possesses other advantageous features, which, with the foregoing, will be set forth at length in the following description where I shall outline in full that form or embodiment of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. The novelty of the invention will be included in the claims succeeding said description. From this it will be apparent that I do not restrict myself to the showing made by such drawings and description as I may adopt many variations within the scope of my invention as expressed in said claims.

Referring to the drawings:—Figure 1 is a perspective view of the vise, as seen from behind, several parts of the frame being broken away to disclose the operating parts.

Fig. 2 is a detail section through the frame and nut taken on the line $x-y$ Fig. 1. Fig. 3 is a perspective view of the lower half of a two part nut. Fig. 4 is a detail showing the means for holding the screw spindle in its elevated position. Fig. 5 is a detail showing the position of the parts in Fig. 4 when the screw spindle is in position to engage the nut. Fig. 6 is a perspective view of the front jaw of the vise showing the dogs and the means for holding them in position. Fig. 7 is a cross section through the vise showing the arrangement of the parts. Fig. 8 is a detail of the lower half nut showing the method of forming the threads therein. Fig. 9 is a perspective view of the screw spindle and its carrying means. Fig. 10 is a plan or top view of the vise with the locking member transposed to the opposite side of the nut, the front jaw being made plain. Fig. 11 is a cross section through the vise shown in Fig. 10, taken in front of the rear jaw, part of the jaw being broken away to disclose the operative parts. Fig. 12 is a detail showing a two part nut closed on the screw spindle. Fig. 13 is a detail showing the screw spindle raised and out of engagement with the nut. Fig. 14 is a detail of the screw spindle and its carrying means, showing a means of obtaining the cushion grip.

The invention consists chiefly of a vise in which the screw spindle may be moved transversely of itself, so that it may be moved out of or into engagement with the nut. The screw spindle is mounted so that it remains parallel to its normal working position when it is moved out of contact with the nut. By this arrangement the screw spindle may be readily moved out of contact with the nut and the front jaw moved freely to the desired position. The screw is then moved back into contact with the nut and the work clamped between the jaws by turning the screw. Means are also employed for holding the screw in the nut and preventing its disengagement as the work is being clamped.

The vise includes other novel features which will be set forth hereinafter.

The vise consists of a main containing frame 1 adapted to carry and support the operating parts, said frame being adapted to be fastened to the under side of a work-bench by means of screws passing through the lips 2—3, which are preferably formed integral with the main frame. The rear,

or stationary jaw 4 of the vise, is also preferably formed integral with the main frame.

The front or movable jaw 28 is supported upon the slides 12—13 which pass through openings 15—16—17—18 in the main frame and which are connected at their rear ends by the end tie 29. The front wall of the main frame is bossed at 10 and 11 to provide increased bearing surface for the slides. Bearing in the front jaw 28 and the end tie 29 is the rod 21 which passes through the apertures 19 and 20 in the main frame, and is movable longitudinally with the sliding frame.

The screw spindle 23 is revoluble in the links 24 and 25 which are securely fastened to the rod 21, that part of the spindle which engages the links being of smaller diameter than the body of the spindle, so that the spindle bears against the faces of the links. The front jaw 28 and the rear tie 29 are arranged parallel to each other and are united by parallel slides 12—13, to which slides the screw spindle is parallel. The links 24—25 are made of equal length and are secured to or formed integral with the rod 21 which is arranged parallel to the slides 12—13, so that as the screw spindle is moved transversely it remains parallel to its normal operative position.

The shape of the structure formed of the rod 21 and the links 24—25 may be varied as desired without interfering with its function of causing the spindle to remain parallel to its normal operative position.

That part of the frame and jaws through which the screw spindle passes, are provided with elongated apertures to allow the spindle to be moved transversely, to move it into or out of engagement with the nut.

The nut which I employ is preferably a two-part nut formed of the upper part nut 6 and the lower part nut 7, which when brought together form a full nut. In the construction shown in Fig. 1, the nut is adapted to move a slight distance longitudinally under the action of the screw as the work is being clamped or unclamped. As the work is being clamped the nut is drawn forward into contact with the pad 5 on the main frame and under the projection 22. This projection 22 locks the upper nut in place and prevents it from becoming disengaged from the screw as pressure is applied. The forward movement of the nut is resisted by the spring 40, thereby forming a cushion between the main frame and the sliding frame, so that a cushion grip between the jaw is obtained immediately before the work is positively gripped. This same result is obtained as the work is unclamped.

The upper nut is pivotally attached to the rod 33 fixed in the main frame, and situated to one side of the screw spindle. For the

purpose of attaching the nut in this manner it is provided with integral arms 35 having bearings on their outer ends to receive the rod 33. The lower nut 7 is also provided with an integral arm 39 which engages the rod 33. This arm 39 preferably engages the rod between the arms 35 so that both parts of the nut are moved longitudinally simultaneously. This arrangement holds the nut parts in proper position with respect to each other, so that they may readily engage the screw when it is moved into its operative position. The lower nut rests on the cross brace 34 of the main frame, and is provided with a projection 36 which engages a groove in the brace 34 and prevents the nut from becoming displaced transversely as the screw spindle is lifted. The lower nut may also be provided on its under surface with the pads 37—38 which facilitate the fitting of the parts when the vise is being assembled.

The ends of the nuts are flared out to give a greater surface contact with the parts with which they contact, thereby holding the nut in position on the screw when pressure is applied by the rotation of the screw and holding the screw in contact with the lower nut.

The spring 40 which is arranged so that a cushion effect is obtained between the main frame and the sliding frame is shown in Fig. 1 mounted on the rod 33 between the main frame and the arms 35 of the nuts. It is not necessary that the spring be placed in this particular location to obtain the desired result and in Fig. 14 I have shown it arranged in a different location. In this instance the spring 72 is arranged on the screw spindle 23 between the front jaw 28 and the T head 50 on the spindle. Since the spindle is in engagement with the nut, forming part of the stationary frame, the spring is disposed between the stationary and movable frames and allows the cushion grip to be obtained. A washer 76 is placed on the screw spindle to receive the thrust of the spring. In this construction the spindle has a limited longitudinal movement in its supporting frame or links to allow the spring to be compressed.

The spring in the construction shown in Fig. 1 is compressed only when the work is being finally gripped and acts to move the nut away from the locking projection as the screw is turned to release the work. The spring in Fig. 1, therefore, performs the double function of producing a cushion grip and of moving the nut from the locked position and in the construction shown in Fig. 14, operates only to produce a cushion grip. When the cushion grip is not desired, however, the spring may be omitted in which case the nut being lighter than the sliding frame will be moved longitudinally into

and out of locked position with the initial turning of the screw to clamp or unclamp the object between the jaws.

Pivoted to the rear wall 9 of the main frame by the pin 42 is the lifting lever 41 which contacts with the screw spindle and is operated by the transverse movement thereof. The lever 41 is preferably provided with an aperture 45 through which the screw spindle passes, so that it is positively operated by a transverse movement of the spindle in either direction. The lever 41 is provided with a slot 43 which is engaged by a pin 44 secured to the upper part of the nut 6. It is evident, therefore, that as the screw spindle is moved upward the lever 41 operates to raise the upper nut. The position of the slot in the lifting lever and the pin in the nut is such that the upper nut is moved a distance approximately equal to twice the throw of the spindle. Therefore, the lifting of the spindle raises it out of engagement with the lower nut and raises the upper nut out of contact with the spindle. Therefore, when the spindle is raised the sliding frame may be readily moved by pushing or pulling with the hand. The links 24 and 25 in which the spindle is mounted, cause it to remain at all times parallel to its operative position, thereby insuring ready engagement or disengagement with the nut as the screw is lowered or raised. The operation of throwing the screw in or out of engagement may readily be performed with one hand, the operative merely raising or lowering the screw spindle by grasping the T head 50 or the handle 52. This allows the other hand to be used in setting or adjusting the work.

The hand of the operator is sufficient to support the weight of the spindle and its supporting parts during the rapid adjustment of the front jaw, but for the purpose of convenience an automatic catch may be provided to hold the spindle in the elevated position. This catch may consist of the hook 46 preferably pivoted to the front jaw at 47, and arranged to be actuated by gravity to engage the spindle.

The rotation of the screw, after the rapid adjustment of the jaw is complete causes the pin 48 in the screw spindle to strike the lip 49 on the hook, forcing the latter to one side and permitting the screw spindle to drop into the nut. The pin 48 and the lip 49 are so placed and proportioned that they do not touch except when the screw is rotated for the purpose of releasing the spindle from the hook. Further, the pin 48 is so placed relatively to the threads of the nut that it releases the catch only at the one point in the revolution of the screw when the latter will drop into immediate engagement with the threads of the nut.

The screw on the spindle is preferably

formed with a square thread which may be slightly backed off or slanted on the rear side of the thread, somewhat after the style of the ordinary buttress thread, since such thread will not have a tendency to raise the spindle out of the nut as the work is being clamped and is readily released from the nut when not under pressure.

In order to facilitate ready engagement and disengagement of the spindle and the half nut, the ends of the threads are ground or chamfered as shown at 84 and 85 and the width of the ends 86 and 87 of the threads are reduced. This will prevent a jamming or sticking of the threads of the spindle and the nut at that point. Clearance is also allowed between the threads of the nut and spindle to facilitate engagement and disengagement.

The front jaw of the vise may be made plain as shown in Fig. 10, or with one or two dogs, as shown in Figs. 1 and 6. The dog consists of a head 63, preferably of a flat half-cylindrical shape and provided with smooth or toothed gripping edges. The head is secured to a cylindrical shank 64, the lower portion 65 of which is of reduced diameter and is provided adjacent to its lower end with a groove in which is seated an annular spring 67. The spring is of slightly larger external diameter than the reduced portion 65, so that it projects beyond the face of said portion.

The sockets for the dogs consist of semi-cylindrical thickenings 55—56 of the jaw, terminating at the top in a seat 68 for the dog head, and in each there is a hole 69, the diameter of which, for a depth equal to the length of the shank 64, is sufficient to give a snug sliding fit when the shank is inserted therein. The lower portion of the hole is reduced to a diameter slightly larger than the small end 65 of the shank and slightly smaller than the diameter of the circular spring 67 held in the groove. When the dog is inserted in the socket it will fall by its own weight until the spring reaches the beginning of the smaller end of the socket. At this point the dog projects above the top of the front jaw, the maximum amount ordinarily required in its use and it is therefore mainly a precaution against wrong usage that no means are provided to hold the dog in a more elevated position. From the point where the spring reaches the beginning of the smaller end of the socket, it requires pressure to push the dog deeper into the socket due to the resistance exerted by the spring. Therefore, the vertical adjustment of the dog is merely a matter of raising or lowering the dog with the fingers within the limit mentioned.

While the spring 67 maintains the vertical adjustment of the dog, it does not interfere with the revoluble adjustment of the

shank within the socket at any point of its vertical adjustment, and this function is an essential element in its use, as it permits the dog head to present either its flat or curved gripping faces to the work. A third dog 70, being of substantially the same shape as the others, but with a larger head and a short shank, is adapted to seat in holes 71 in the bench top, to form the rear stop necessary in using the dogs on the jaw. The inner face of the front jaw is often provided with a wooden lining 60, and this is provided with recesses 81—82 to allow the fingers to be inserted to raise the dogs.

When the dogs are being used to grip and hold an article, such as a ring, by pulling outward thereon, it is evident that the screw spindle is turned in the opposite direction to which it is turned when an article is to be gripped between the jaws. This reverse movement will cause the nut to move backward toward the rear wall 9 clamping the lifting lever 41 between the nut and the wall. The lifting lever being thus locked in position it is evident that the upper part of the nut cannot rise and the screw cannot become disengaged from the nut. The nut is, therefore, securely locked in position without the use of the locking lug 22. In the vise shown in Figs. 10, 11, 12 and 13, I make use of this fact for locking the nut in place when an article is gripped between the jaws, without the use of the locking lug 22, by transposing the position of the lifting lever 41. Instead of placing the lifting lever between the nut and the rear wall 9, as shown in Fig. 1, I place it between the nut and the front jaw 4. When work is clamped between the jaws the lifting lever is clamped between the nut and the pad 5, the frictional contact being sufficient to prevent the lever from being raised. The lever 41, therefore, performs the additional function of locking the upper nut about the screw thereby locking the screw in the lower nut and also acts directly on the screw to lock it in the lower nut. In the construction shown in these figures, no cushion grip is possible between the jaws, as the springs have been omitted. A cushion grip may be obtained in this construction by employing the springs arranged in either of the positions shown in Figs. 1 or 14. The action of the vise, however, in all other respects is the same as that shown in Fig. 1. In reverse use, the frictional contact between the flared end of the nut and the pad 8 on the rear wall of the main frame is sufficient to lock the nut about the screw.

Throughout the specification I have referred to the nuts as half nuts, but it is to be understood in the sense of part nuts, as it is evident that the construction could readily be changed to accommodate nuts of other divisions than halves.

The expression part nut is used to designate a nut which is not a whole nut formed in one piece and includes whole nuts formed of a plurality of segmental parts or a segmental part alone.

I claim:

1. In a vise, a nut, a screw spindle terminating in a head, and supports permitting said spindle to be moved transversely while maintaining its parallelism into and out of engagement with said nut by lateral pressure upon said head.

2. In a vise having a jaw adapted to be moved by a screw spindle, a screw spindle terminating in a head, said screw spindle being movable transversely by lateral pressure upon said head, and means engaging said spindle adapted to maintain the parallelism of the spindle in all its positions.

3. In a vise, a main frame, a nut, a slidable frame, and a screw spindle terminating in a head, said spindle being movable transversely to disengage or engage said nut by lateral pressure upon said head, and means for maintaining said spindle parallel to its normal operative position.

4. In a vise, a slidable frame, a screw spindle terminating in a head, means pivotally attached to said frame adapted to carry said screw spindle and to maintain its parallelism when shifted transversely by lateral pressure upon said head.

5. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle terminating in a head carried by said slidable frame, supports permitting said spindle to be moved at right angles to its axis into and out of engagement with said nut by lateral pressure upon said head, and means for locking the spindle in engagement with the said nut.

6. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle terminating in a head carried by said slidable frame, supports permitting said spindle to be moved transversely while preserving its parallelism into and out of engagement with said nut by lateral pressure upon said head, and means for supporting said spindle out of engagement with said nut.

7. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle terminating in a head carried by said slidable frame, supports permitting said spindle to be moved transversely while preserving its parallelism into and out of engagement with said nut by lateral pressure upon said head, means for supporting the spindle out of engagement with said nut and means operated by the turning of the spindle to release it from said supporting means.

8. In a vise, a part nut, a screw spindle adapted to be moved transversely into and out of engagement with said nut and means operative by the movement of the spindle

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away from one part of the nut to cause the other part to move away from the spindle.

9. In a vise, a two part nut, a screw spindle adapted to be moved transversely into and out of engagement with said nut, a lifting lever engaging said spindle and means connecting said lifting lever with one of the nut parts.

10. In a vise, a main frame, a part nut engaging said frame, a sliding frame, a screw spindle carried by said sliding frame adapted to be moved transversely into and out of engagement with said nut, and a lever engaging said spindle pivoted to said main frame and arranged between said main frame and said nut.

11. In a vise, a main frame, a two part nut engaging said frame, a slidable frame, a screw spindle carried thereby adapted to engage said nut, means for supporting said spindle to allow it to be moved transversely and a lever pivoted to the main frame and engaging said spindle, said lever being provided with a groove adapted to be engaged by a pin to one of the nut parts.

12. In a vise, a main frame, a nut engaging said frame, a slidable frame, a longitudinally disposed rod in said frame, links of equal length attached to said rod and a screw spindle carried by said links adapted to be moved transversely into and out of engagement with said nut.

13. In a vise, a main frame, a nut engaging said frame, a slidable frame, a longitudinally disposed rod bearing in the opposite ends of said frame, links of equal length attached to said rod adjacent to the ends, a screw spindle rotatably supported in said links and means for limiting the movement of said links adapted to be moved transversely into and out of engagement with said nut.

14. In a vise, a main frame, a nut engaging said main frame, a slidable frame, a screw spindle carried thereby adapted to engage said nut, and a spring arranged between said main frame and said sliding frame arranged to be compressed as the work is gripped between the jaws of the vise.

15. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle carried thereby adapted to engage said nut, said nut being capable of limited longitudinal movement with respect to said main frame, and a spring interposed between said nut and said main frame arranged to be compressed as the work is gripped between the jaws of the vise.

16. In a vise, a main frame, a two part nut engaging said main frame and capable of limited longitudinal movement with respect thereto, a sliding frame, a screw spindle carried thereby adapted to engage said nut and a projection on said main frame un-

der which the part nut is adapted to be drawn as the screw is rotated.

17. In a vise, a main frame, a two-part nut arranged therein, and capable of limited longitudinal motion with respect to said frame, a slidable frame, a screw spindle carried thereby adapted to engage said nut, a projection on the main frame under which said nut is adapted to be drawn as the spindle is rotated and a spring arranged to be compressed as said nut is drawn under the projection.

18. In a vise, a main frame, a two-part nut arranged therein capable of limited longitudinal movement with respect to said frame, a slidable frame a screw spindle carried thereby adapted to engage said nut, said spindle being adapted to be moved transversely into and out of engagement with said nut and a lever engaging said spindle arranged between the nut and the main frame.

19. In a vise, a main frame, a two-part nut arranged therein capable of limited longitudinal movement with respect to said frame, a slidable frame, a screw spindle adapted to engage said nut carried thereby, said spindle being capable of limited transverse movement, a lifting lever engaging said spindle arranged between the nut and the main frame and means connecting said lever with one part of said nut to cause said part to move away from the spindle as the spindle is moved out of engagement with the other part.

20. In a vise, a main frame, a two part nut arranged therein capable of limited longitudinal movement with respect to said frame, one part of said nut being movable transversely of the frame, a slidable frame, a screw spindle, adapted to engage said nut, carried thereby, said screw spindle being movable transversely, a lifting lever pivoted to the main frame, engaging said spindle between the nut and the main frame, and means connecting said lever with the transversely movable part of said nut, to cause said part to be moved transversely simultaneously with the transverse motion of the spindle, the connection between the lever and the movable part of the nut being such that the nut part moves through a greater distance than the spindle.

21. In a vise, a main frame, a nut formed of a plurality of parts arranged therein, said nut being capable of limited longitudinal movement with respect to said frame, a slidable frame, a screw spindle carried thereby adapted to be moved transversely into and out of engagement with said nut and means for holding said nut parts alined transversely.

22. In a vise, a main frame, a nut formed of a plurality of parts arranged therein, a slidable frame, a transversely movable

- screw spindle carried thereby, said spindle being movable into and out of engagement with said nut, means operated by the transverse movement of the spindle out of one nut part to cause the other nut parts to move away from the spindle and means preventing the transverse movement of the first nut part, as the spindle is moved out of engagement.
23. In a vise, a main frame, a slidable frame, a half nut and a screw spindle adapted to be moved transversely into and out of engagement with said nut, the threads of said nut being beveled at their ends in a plane parallel to the axis of the helical curve of said threads.
24. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle carried by said frame adapted to be moved transversely into and out of engagement with said nut, means for supporting said spindle out of engagement with the nut and means for releasing said spindle from said supporting means when the threads of the spindle are in line with the grooves between the threads of the nut.
25. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle carried by said frame adapted to be moved transversely into and out of engagement with said nut, a hook for supporting the spindle out of engagement with the nut and a projection on the spindle adapted to engage said hook and move it out of engagement with the spindle.
26. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle carried by said frame adapted to be moved transversely into and out of engagement with said nut, a hook for supporting said spindle out of engagement with the nut, a tooth on said hook and a projection on the spindle adapted to engage said tooth and move the hook out of engagement with the spindle when the threads of the spindle are aligned with the grooves between the threads of the nut.
27. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle carried by said slidable frame adapted to be moved transversely while maintaining its parallelism to its normal operative position into and out of engagement with said nut, means for locking the spindle in engagement with said nut and means for supporting it out of engagement with the nut.
28. In a vise, a nut, a screw spindle terminating in a head, said spindle adapted to engage revolubly in either direction with said nut, supports permitting said spindle to be moved transversely to disengage or engage said nut by lateral pressure upon said head, and means for insuring parallelism in said transverse movement.
29. In a vise, the combination of two opposing jaws with a nut and a screw spindle threaded for a distance to correspond with the opening capacity of the jaws and terminating at its outer end in a handle piece, and means whereby said spindle may be shifted while maintaining its parallelism, out of and into engagement with said nut by direct transverse pressure against said handle.
30. In a vise, a main frame, a nut, a slidable frame, a screw spindle adapted to engage the nut, and means carried by said slidable frame adapted to rock about pivots on a line parallel to said screw spindle and adapted to revolubly hold it and to shift it transversely when lateral pressure is applied to the end of said screw spindle.
31. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle, means pivotally attached to said slidable frame adapted to revolubly carry said screw spindle, said screw spindle being adapted to be moved transversely about said pivots into and out of engagement with said nut and means for locking said spindle in engagement with said nut.
32. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle, means pivotally attached to said slidable frame adapted to revolubly carry said screw spindle, said screw spindle being adapted to be moved transversely about said pivots into and out of engagement with said nut and means for supporting said spindle out of engagement with said nut.
33. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle, means pivotally attached to said slidable frame adapted to revolubly carry said screw spindle, said screw spindle being adapted to be moved transversely about said pivots into and out of engagement with said nut, means for supporting said spindle out of engagement with said nut and means operated by the turning of the said spindle to release it from said supporting means.
34. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle terminating in a head, and means pivotally attached to said slidable frame adapted to revolubly hold said screw spindle and to maintain its parallelism to the axis of the nut when said means are rocked about said pivots by direct lateral pressure upon said head.
35. In a vise, a front jaw provided with a cylindrical socket, a dog shank adapted to engage said socket and to be revolubly and vertically adjustable therein, a spring disposed between the lower portion of said dog shank and said front jaw to maintain the vertical adjustment of said dog shank, and a head on said shank.

36. In a vise, a movable jaw, slidable frame carrying said movable jaw, a socket in said jaw, a vertically and revolubly adjustable dog arranged in said socket, said dog having a head of the form described, and means frictionally disposed between said jaw and said dog to maintain the vertical adjustment of said dog in said socket.

37. In a vise, a front jaw provided with a cylindrical socket the lower portion of which is of decreased diameter, a dog shank adapted to engage said socket and adapted to be revolubly and vertically adjustable therein and means carried in said shank adapted to frictionally engage the wall of said socket at the smaller end.

38. In a vise, the combination of a movable jaw provided with two vertically and revolubly adjustable dogs, and a detachable revolubly and vertically adjustable bench stop to be located at the apex of the triangle of which the two dogs in the said movable jaw represent the other two apices, for the purpose of providing a three-point contact for any irregular object.

39. In a vise, a movable jaw provided with a vertically arranged cylindrical socket, the lower portion of which is of smaller diameter than the upper portion, a dog having a cylindrical shank the lower portion of which is of smaller diameter than the upper portion, and a spring engaging said lower portion, adapted when the dog is in place to frictionally engage the smaller portion of the socket.

40. In a vise, a main frame, a nut, a slidable frame and a screw spindle adapted to operatively engage the nut, said screw spindle being movable transversely maintaining its parallelism, into and out of engagement

with said nut by direct lateral pressure against the end of said spindle.

41. In a vise, a main frame, a nut, a slidable frame, a screw spindle bodily movable transversely, means for positively holding said screw in parallelism with its original position during the transverse movement, and means for locking said screw spindle in engagement with said nut.

42. In a vise, a main frame, a nut, a slidable frame, a screw spindle adapted to be moved transversely into and out of operative engagement with said nut, means for positively insuring parallelism in said transverse movement, and means for supporting said spindle out of engagement with said nut.

43. In a vise, a main frame, a nut engaging said frame, a slidable frame, a screw spindle carried by said slidable frame adapted to be moved transversely into and out of engagement with said nut, a hook for supporting the spindle out of engagement with the nut, and means carried by said spindle to engage said hook and move it out of engagement with said spindle.

44. In a vise, a nut and a screw spindle adapted to engage said nut, said spindle being movable transversely as a prime mover, and means operative by the movement of the spindle to open said nut and release the spindle therefrom.

In testimony whereof, I have hereunto set my hand at San Francisco, Cal., this 21st day of October, 1911.

CHARLES SUMNER EVANS.

In presence of—
H. G. PROST,
R. HEFFERNAN.

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

Corrections in Letters Patent No. 1,141,237.

It is hereby certified that in Letters Patent No. 1,141,237, granted June 1, 1915, upon the application of Charles Sumner Evans, of Berkeley, California, for an improvement in "Vises," errors appear in the printed specification requiring correction as follows: Page 5, line 39, claim 13, after the word "links" insert the words *adapted to be moved transversely into and out of engagement with said nut*; same page and claim, lines 40-42, strike out the words "adapted to be moved transversely into and out of engagement with said nut"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 9th day of November, A. D., 1915.

[SEAL.]

J. T. NEWTON,
Acting Commissioner of Patents.