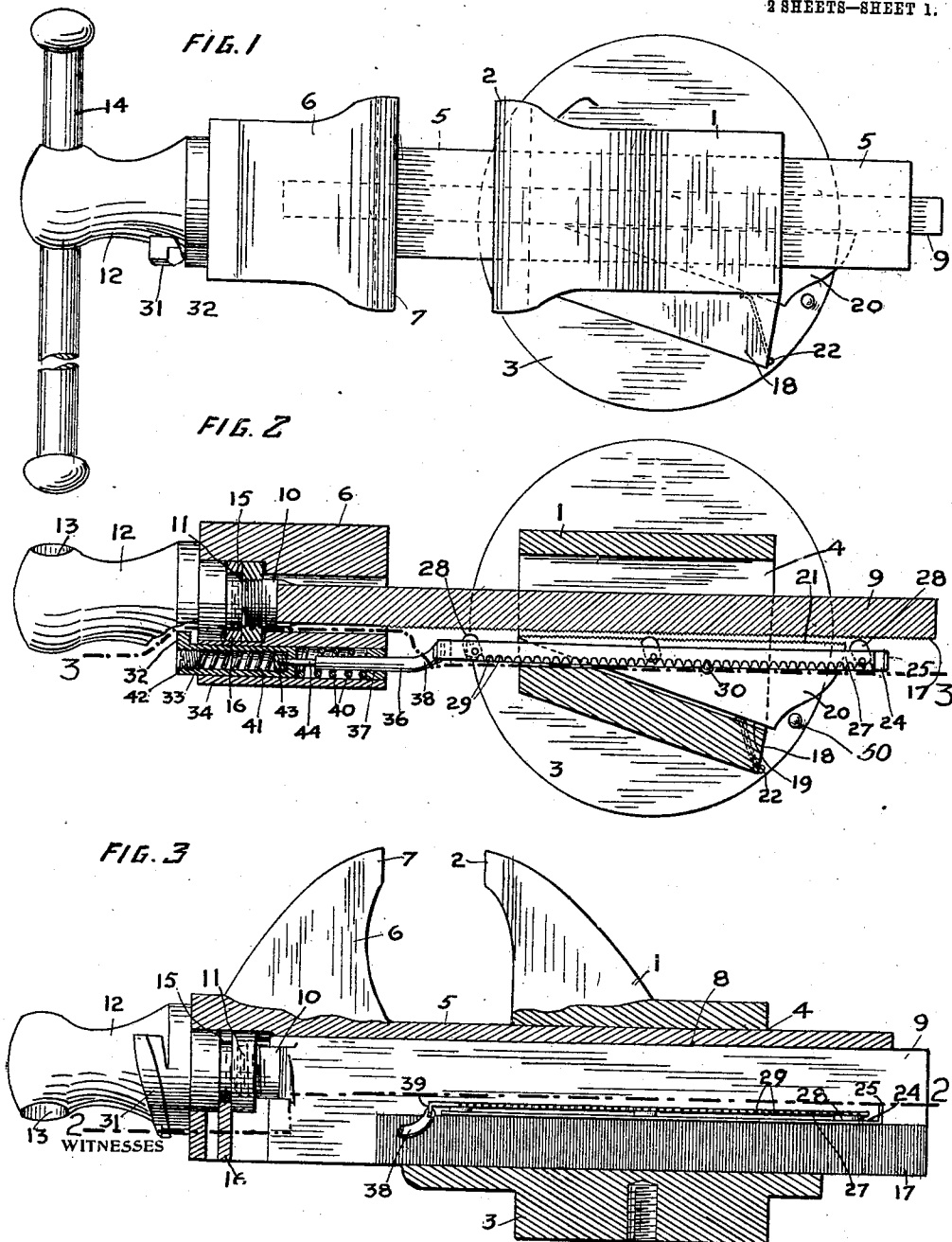




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BENCH VISE.

APPLICATION FILED FEB. 4, 1909.

Patented Sept. 6, 1910.

2 SHEETS—SHEET 2.

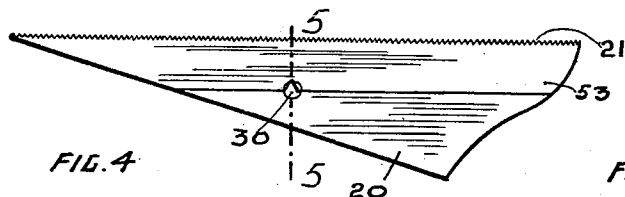


FIG. 4

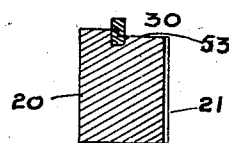


FIG. 5

FIG. 6

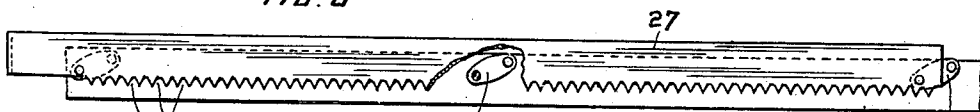


FIG. 7

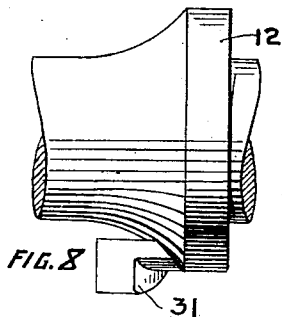
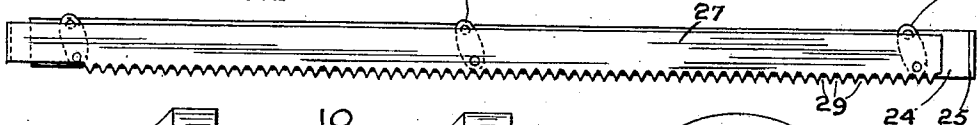


FIG. 8

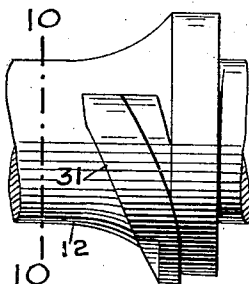


FIG. 9

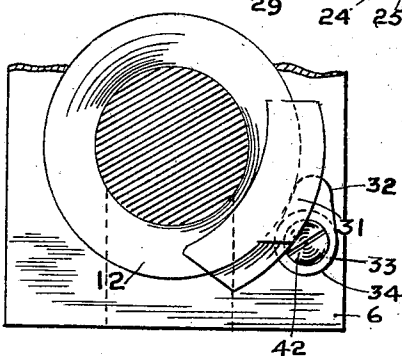


FIG. 10

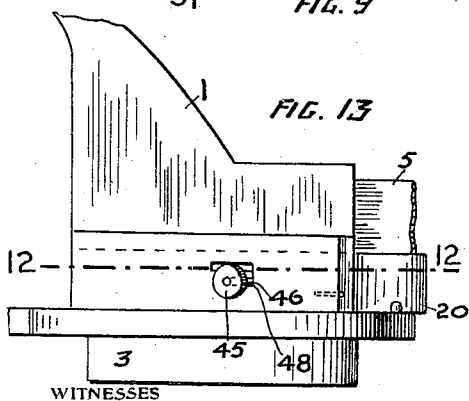


FIG. 13

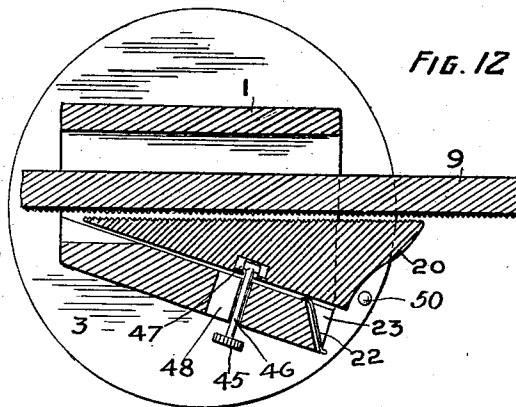
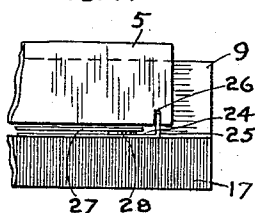


FIG. 12

FIG. 11



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BENCH-VISE.

969,401.

Specification of Letters Patent.

Patented Sept. 6, 1910.

Application filed February 4, 1909. Serial No. 476,002.

To all whom it may concern:

Be it known that I, AXEL W. PETERSON, a citizen of the United States, residing at Jamison, in the county of Fresno and State of California, have invented new and useful Improvements in Bench-Vises, of which the following is a specification.

The object of the present invention is to provide a bench vise, which, while it can be used more expeditiously than the vises customarily in use, will have a powerful grip and will also be very strong for a given size.

In the accompanying drawings, Figure 1 is a plan view of the vise; Fig. 2 is a horizontal section thereof on the line 2—2 of Fig. 3; Fig. 3 is a vertical section thereof on the line 3—3 of Fig. 2; Fig. 4 is a plan view of the wedge detached; Fig. 5 is a cross section of the same on the line 5—5 of Fig. 4; Fig. 6 is a broken plan view of the shifter strips; Fig. 7 is a plan view of the same in a different position from that of Fig. 6; Fig. 8 is a broken side view of the head; Fig. 9 is a similar view of the same in a different position from that shown in Fig. 8; Fig. 10 is a cross section on the line 10—10 of Fig. 9; Fig. 11 is a broken vertical section at the end of the vise showing in detail the engagement of one of the plates with the guide bar; Fig. 12 is a broken horizontal section showing a modified form of the means for shifting the wedge, taken on the line 12—12 of Fig. 13; Fig. 13 is a broken side view of the same.

Referring to the drawing, 1 indicates one of the vise members, having a jaw 2 and a base 3, adapted to be secured to a bench by means of a screw screwed centrally thereinto. Said member 1 is formed with a guideway 4, T-shaped in cross section, in which can slide a guide bar 5 secured to the other vise member 6, which has a jaw 7. In the under side of said guide bar 5 is formed a deep central groove 8 in which can slide a clamping bar 9, which is of considerable depth in proportion to its width, but, at its front end, is formed with a comparatively wide, cylindrical, threaded stem 10, which screws into an internal thread 11 formed in the wall of a cavity in a vise head 12, the latter having a transverse aperture 13, in which is the usual loose lever or handle 14 for turning said head. Said head 12 is formed with an external circular groove 15, into which extends a cleat 16 firmly secured

at its edges in the two sides of the vise member 6. It will be observed that the upper surface of the clamping bar 9 and the under surface of the upper side of the guide bar 5, or those surfaces which are parallel with the plane through both gripping edges of the jaws 2 and 7, are in contact with each other, so that the pressure upon the clamping jaw 7 is resisted, not only by the shell or guide bar 5, but also by the clamping bar 9, and, in fact, to so resist said pressure the shell or guide bar 5 and the clamping bar 9 act as a solid piece, thus affording great strength.

It will readily be seen that, with the above construction, if the clamping bar 9 and the guide bar 5 are both freely movable, the jaw 7 can be freely moved to and from the jaw 2; but, if the clamping bar be rigidly fixed, then the jaw 7 can only be moved by turning the head 12 upon the threaded stem 10 of the clamping bar, the vise jaw 7 then traveling with the head. In order to accomplish this result I provide the following means for fixedly securing the clamping bar at will. On one side of that portion of the clamping bar 9 which extends outside of, or below, the groove 8 in the guide bar 5 are formed transverse ribs or corrugations 17. The corresponding side of the vise member 1 is laterally extended, as shown at 18, and therein is formed a wedge-shaped or tapering chamber 19, adapted to receive a correspondingly wedge-shaped or tapering clamp 20. That face of said wedge 20 which is next to the corrugated side of the bar 9 is also corrugated, as shown at 21. Said wedge 20 is movable longitudinally and normally pressed forward, or toward its pointed end, and also toward the member 6, by means of a spring 22, which works in a slot 23 in the extension 18. A stop 50 is provided for limiting the rearward movement of the wedge.

It will readily be seen that, when the wedge is in its normal position, so that the outer side engages the corrugated part 17 of the clamping bar 9, any forward pull upon the clamping bar tends to move said wedge forward, and thereby to clamp it still more firmly against said clamping bar and prevent any further forward movement of the latter. If the clamping bar be thus held by the wedge against forward movement, then, if the handle 14 be rotated so as to rotate the vise head and to screw the

same upon the threaded stem 10 of the clamping bar, since the clamping bar itself is firmly held by the member 1 of the vise, the effect is to draw the member 6 of the vise toward the member 1. This clamping bar is used principally for the purpose of permitting a rapid action in operating the vise, and in moving longitudinally the movable member when desired. To do this it is necessary to remove the corrugated face 21 of the wedge from the corrugated face 17 of the clamping bar, so that the latter is no longer held by the former. For this purpose I form, in the upper surface of the wedge adjacent to the clamping bar, a longitudinal guideway or depression 53, in which rests a lower narrow strip or plate 24, the rear or inner end of which is bent upward, as shown at 25, and engages a notch 26 formed in the guide bar 5, so as to prevent any longitudinal movement of said lower plate or strip relative to said guide bar. Over said lower plate is an upper shifter plate 27, which is connected to the lower plate by three links or cams 28. The outer edge of said upper plate 27 is formed with a series of notches 29, any one of which is adapted, when the upper plate is moved laterally outward, or away from the guide bar 5, to engage an angular edge of a stud 30 secured upon the upper surface of the wedge. Since the lower plate is prevented from moving longitudinally relative to the guide bar, and since the upper plate is connected to the lower plate by the links, the result is that, if the upper plate be moved longitudinally rearward, it will also move outward, and will therefore, by its engagement with the stud 30 on the wedge, carry with it the wedge, and will move said wedge rearwardly and away from the corrugated surface of the clamping bar, so that the latter is no longer clamped.

In order to so move it longitudinally, there is secured to the head 12 a spiral cam 31, which, when said head is turned so as to screw it outward, engages a lug 32 formed upon a tube 33 which slides in a bearing 34 in the member 6, and thereby, in the manner to be presently described, imparts a rearward longitudinal movement to a stem 36 which slides longitudinally in a guideway 37, and the outer or rear end 38 of which is bent upward and is forked and engages the bent forward end 39 of the upper plate 27. Consequently the rotary movement of the head, through the medium of the spiral cam 31, imparts a rearward longitudinal movement to said plate 27, and thereby disengages the wedge from the clamping bar in the manner already indicated. The spiral cam or screw 31, being wholly outside the clamping bar, in no way detracts from its strength. Said tube 33 and the lug carried thereby are normally

pressed downwardly by means of a coiled spring 40 around said stem 36 and between the bearing 37 for the stem and the end of the tube. Said tube 33 is not connected directly with said stem, but imparts motion thereto by means of a coiled spring 41 within the tube, confined between a plug 42 screwed into the front end of the tube and a collar 43 screwed on to the end of a reduced portion 44 of said stem, which reduced portion passes through the rear end of the tube. It will be observed that, by the above construction, the clamping bar is automatically released when the handle of the device is turned in the direction to unscrew the head and withdraw the jaw attached thereto from the fixed jaw.

A simpler form of the apparatus is shown in Figs. 12 and 13, and in this form the release of the clamping bar is effected, not automatically, but at the will of the operator, by the movement of a handle 45 attached to a stem 46 pivoted, as shown at 47, to the wedge. Said handle slides through a bayonet-slot 48 formed in the wedge-shaped extension 18, and, when the handle reaches the end of the slot, it is dropped down into the right angled extension thereof, so that the wedge is held in its unlocked position against the action of the spring 22. By reason of the wedge 20 being pressed against the extension 18 and the vise member 1, and the rack being formed on the guide bar 9, the wedge does not move with the movable head, but remains always in approximately the same position, and an important result of this construction is that the extension 18, which withstands the outward pressure from the wedge, is formed immediately over the base 3, and is, of course, formed integral therewith, and is therefore of great strength.

I claim:—

1. The combination of a stationary vise member, a movable vise member having a guide bar slidable through the stationary member, said members having gripping jaws, a clamping bar slidable within the guide bar, a wedge for clamping said clamping bar against longitudinal movement relatively to the stationary member, said wedge and clamping bar having corrugated opposing faces, the stationary member having a wedge-shaped cavity to receive said wedge, said wedge and cavity being arranged each with a narrow end directed toward the movable member, and means wholly, outside said clamping bar, for moving the movable member relatively to the clamping bar, substantially as described.

2. The combination of a stationary vise member, a movable vise member having a guide bar slidable through the stationary member, said members having gripping jaws, a clamping bar slidable within the

guide bar, a wedge for clamping said clamping bar against longitudinal movement relatively to the stationary member, the stationary member having a wedge-shaped cavity to receive said wedge, said wedge and cavity
5 being arranged each with a narrow end directed toward the movable member, and means wholly, outside said clamping bar, for moving the movable member relatively
10 to the clamping bar, substantially as described.

3. The combination of a stationary vise member, a movable vise member having a guide bar slidable through the stationary member, said members having gripping
15 jaws, a clamping bar slidable within the guide bar, a wedge for clamping said clamping bar against longitudinal movement rela-

tively to the stationary member, the stationary member having a wedge-shaped cavity
20 to receive said wedge, said wedge and cavity being arranged each with a narrow end directed toward the movable member, and a rotary head movable longitudinally with the movable member, said head and clamping
25 bar having, the one a threaded stem and the other a threaded socket to receive said stem, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing
30 witnesses.

AXEL W. PETERSON.

Witnesses:

FRANK A. CURTIN,
H. E. BARBOUR.