(No Model.)

J. J. SPILKER.

VISE.

No. 334,816. Patented Jan. 26, 1886.

FIG. 1.

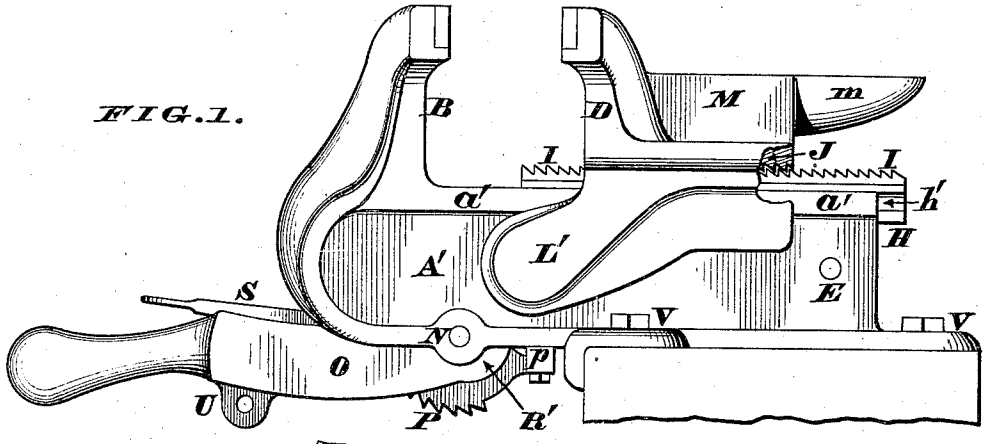


FIG. 2.

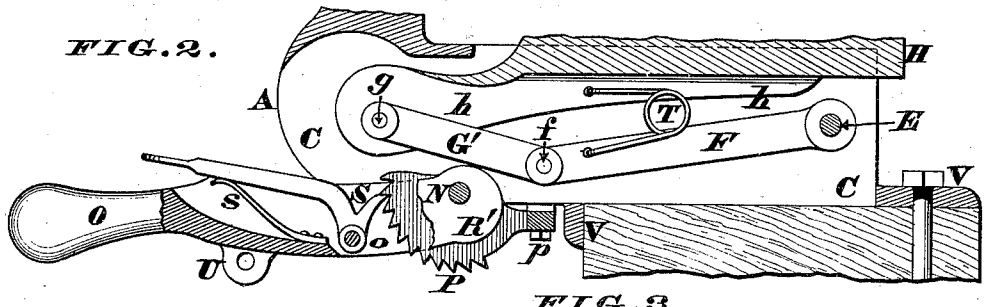


FIG. 3.

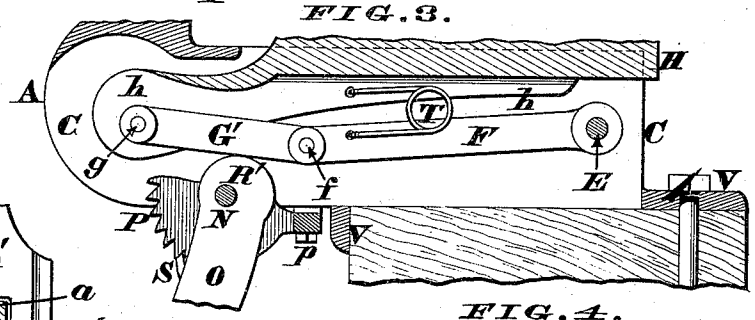


FIG. 5.

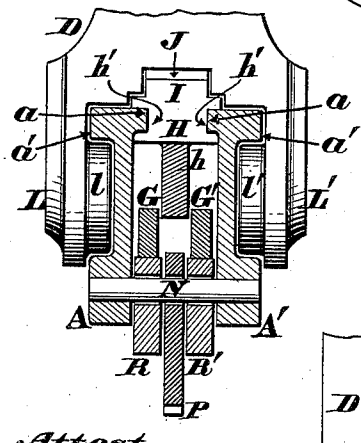


FIG. 6.

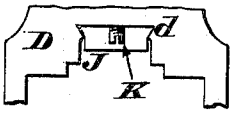


FIG. 4.

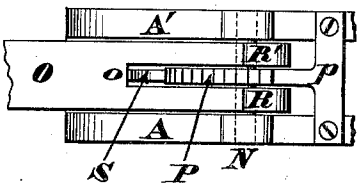
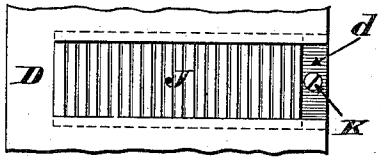


FIG. 7.



Attest.
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N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN J. SPILKER, OF CINCINNATI, OHIO.

VISE.

SPECIFICATION forming part of Letters Patent No. 334,816, dated January 26, 1886.

Application filed October 2, 1884. Serial No. 144,765. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. SPILKER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Vises, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of my invention is to provide a vise whose inner or movable jaw can be instantly shifted by hand to give the work a preliminary grasp, and can then be finally advanced a slight distance, but with immense power, so as to hold said work in the most secure manner. To accomplish this result, the rear or movable jaw is furnished with ratchet-teeth that engage with similar-shaped teeth on a carriage or slide having a slight reciprocating motion within the frame or bed of the implement, said carriage being advanced by a toggle, operated by a cam or a pair of cams at the end of a suitable lever or handle. This lever is pivoted to the frame or bed, from whose front end the stationary jaw projects, and has a pawl capable of engaging with a suitable detent the instant said lever is depressed for the purpose of causing its cams to straighten the toggle. By thus straightening said toggle the carriage and its coupled jaw are advanced and then securely locked, so as to retain the work immovably in place, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a side elevation of my improved vise, the carriage being retracted, the lever elevated, and a portion of the rear end of the movable jaw being sectioned. Fig. 2 is a vertical section of a portion of the implement, taken in the plane of the toggle, the operative parts being in the same position as seen in the preceding illustration. Fig. 3 is a similar section, but showing the lever depressed and the carriage advanced. Fig. 4 is a plan of a portion of the under side of the vise. Fig. 5 is an enlarged transverse section thereof, taken in the plane of the pivot N. Fig. 6 is an elevation of a portion of the rear end of the movable jaw. Fig. 7 is a plan of a portion of the under side of said jaw.

A A′ represent the parallel side plates of the vise, said plates being united in front to form the fixed jaw B, while the longitudinal slot or passage C between these two plates affords sufficient room for the application of the devices that operate the movable jaw D, which operating devices are arranged as follows: Disposed athwart the passage C and near the rear end thereof is a horizontal pin, E, upon which is hung one extremity of a link, F, which is coupled by means of a knuckle, *f*, to two other parallel links, G G′, the link G being seen only in Fig. 5. The front ends of these parallel links G G′ are coupled by pivot *g* to a stout flange or rib, *h*, projecting from the under side of the reciprocating slide or carriage H, which has a slight movement longitudinally of the passage C, being confined to a proper path by tongues *a* at the upper edges of plates A A′, entering grooves *h′* of said carriage, as seen in Fig. 5. The upper face of this carriage is provided with ratchet-shaped teeth I, disposed as seen in Fig. 1, and adapted for engagement with similar-shaped teeth J on the under side of the movable jaw D. I prefer making these teeth on a separate bar and fitting said bar into a dovetailed groove, *d*, of the jaw D, as seen in Figs. 6 and 7, a screw, K, being employed to retain the toothed bar in its proper place. The front of this bar J bears firmly against the end of the groove, so as to sustain the stress brought to bear on the movable jaw D when the latter grasps the work. This jaw has cheeks L L′, provided with inwardly-projecting circular bosses *l l′*, whose upper edges bear against the under side of the outwardly-projecting tongues *a′* at the top of side plates, A A′, as seen in Fig. 5. Furthermore, the upper surface of jaw D is made in the shape of a small anvil, M, from which projects rearwardly a beak or horn, *m*.

Secured athwart the passage C and near the front of the vise is a fulcrum-pin, N, upon which is hung a lever, O, slotted at *o*, to admit a locking device, the latter being a segmental ratchet-wheel, and being attached to a cross-bar, *p*, that is connected to the under side of plates A A′, as seen in Fig. 4. Consequently said bar, in connection with the fulcrum-pin N, holds the locking device P immovably in position. The inner end of the forked lever takes the shape of a pair of cams, R R′, that are eccentric with reference to the fulcrum-pin N, said cams being adapted to lift the links G G′ when the carriage or slide H *h* is to be

advanced. Pivoted within the slotted end of lever O is a pawl, S, that engages with the locking device P, said pawl being held up to its work by a suitable spring, *s*.

T is a spring that opens the toggle F G G′.

U is a perforated lug, to which a suitable connection may be coupled when it is desired to operate the lever O by means of a treadle or other foot appliance.

V are perforated ears, through which bolts or screws are passed for the purpose of securing the vise to a bench or other support.

When my vise is in its normal position, lever O is elevated, as seen in Figs. 1 and 2, and carriage H is retracted, because the spring T is now at liberty to exercise its full stress in opening the toggle F G G′, or, in other words, of causing the links F G G′ of said toggle to assume the obtuse angle seen in Fig. 2. The movable jaw D can now be readily drawn forward by hand to grasp the work, on account of the ratchet-shaped teeth J of said jaw riding freely over the other ratchet-teeth, I, of the slide or carriage H. After the movable jaw D has been thus expeditiously advanced the free end of lever O is depressed, as seen in Fig. 3, which act causes the cams R R′ of said lever to elevate the links G G′ a distance equal to the eccentricity of said members R R′. Now, as the rear end of link F cannot move, because it is held by the transverse pin E, it is evident this elevation of the other links, G G′, must straighten the toggle F G G′, and thereby advance the carriage or slide H and its connected jaw D. This advance movement of the carriage is comparatively slight; but the force exerted thereby is immense, on account of the power being produced by the conjoint action of the cams and toggle. Consequently the work is held between the jaws B and D with an immovable grip, the engagement of the pawl S with the locking device P serving to prevent any accidental retraction of the carriage H; but when it is desired to liberate the work the lever O is elevated, thereby permitting the spring T to exert its force in opening the toggle, which act immediately retracts the carriage H and its connected jaw D. The work being removed, and it being desired to grasp a wider piece, the jaw D can be slightly elevated, so as to cause its teeth J to clear the teeth I of the carriage and allow said jaw to be retracted as far as may be necessary, when the new piece is grasped, and said carriage is again advanced by simply depressing the lever O, as previously described.

Owing to the immense power developed by the action of the cams on the toggle, the jaws B and D may have suitable attachments applied to them for the purpose of punching metal, thereby rendering the implement especially useful for the fittings of light machinery, &c., the device M *m* enabling such fitting to be readily shaped without employing a special anvil. By coupling a treadle attachment to the perforated lug U the lever O can be depressed by foot, thereby allowing the artisan to use both of his hands for adjusting the work in the vise. Finally, if the vise should be made for the purpose of grasping any article of a fixed and invariable size, the movable jaw D can be cast in one piece with the carriage or slide H, thereby dispensing with the coupling-teeth I and J.

I claim as my invention—

1. The combination, in a vise, of the stationary jaw B at the junction of the outer ends of the side plates, A A′, the latter being separated by a longitudinal passage, C, having near its rear end a transverse pin, E, to which is coupled the link F of a toggle-lever, F G G′ *g*, the links G G′ of said toggle being united to the flange *h* of a reciprocating slide, H, that carries the detachable jaw D, a slotted lever, O, provided with a pair of cams, R R′, and pawl S, being arranged to operate said toggle in the manner herein described, and a ratchet-wheel, P, being fitted in the slotted end of said lever for the purpose of holding said toggle to any specific adjustment, as set forth.

2. In combination with a vise having a reciprocating slide or carriage, H, and a shiftable jaw, D, coupled thereto in the manner described, the cheeks L L′, provided, respectively, with bosses *l l′*, that bear against the under side of the flanges *a′ a′* of the frame or bed, for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN J. SPILKER.

Witnesses:

JAMES H. LAYMAN,

LEWIS H. BOND.