(No Model.)

M. CASHIN.

SCREW DRIVER.

No. 391,880. Patented Oct. 30, 1888.

Fig. 1.

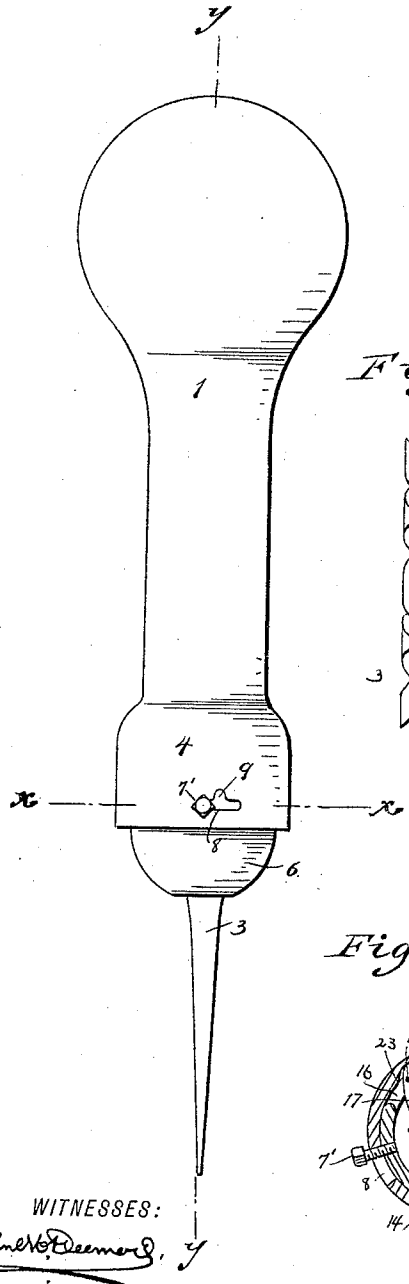


Fig. 2.

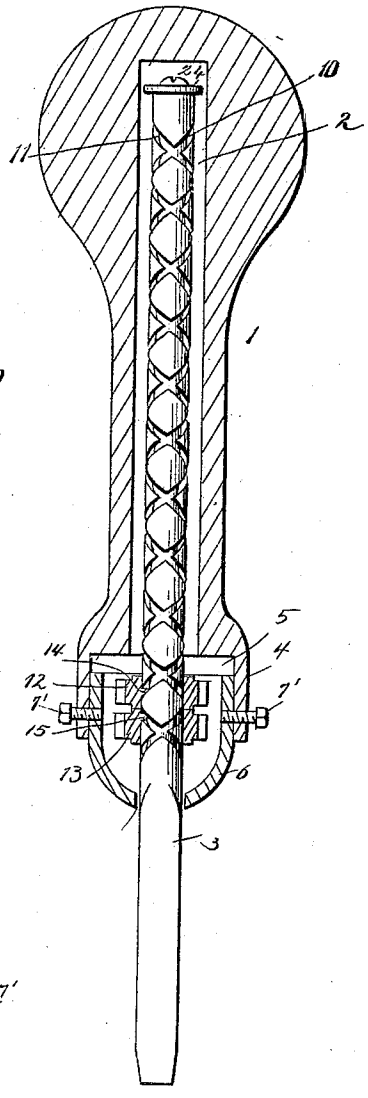


Fig. 4.

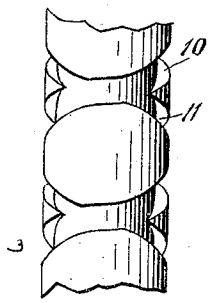
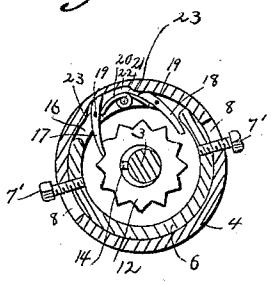


Fig. 3.



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UNITED STATES PATENT OFFICE.

MICHAEL CASHIN, OF NEW YORK, N. Y.

SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 391,880, dated October 30, 1888.

Application filed March 31, 1888. Serial No. 269,120. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL CASHIN, of the city, county, and State of New York, have invented a new and Improved Screw-Driver, of which the following is a full, clear, and exact description.

This invention relates to an improvement in screw-drivers, and has for its object to lessen the labor of securing or removing a screw.

The invention consists in a screw-driver constructed and arranged as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the invention. Fig. 2 is a vertical section on the line *y y*, Fig. 1. Fig. 3 is a horizontal section on the line *x x*, Fig. 1; and Fig. 4 is a detail view of the bit broken away.

In the construction of this device a handle, 1, is employed, formed with a slot, 2, extending nearly throughout its length, in which is located a bit, 3. The head 4 of the handle 1 is formed with a recess, 5, in which is located a cap or covering piece, 6, having an opening, 7, through which the bit 3 projects and is adapted to move. The cap 6 is held in place by one or more screws or pins, 7', two being preferably used, as here shown, which project through inverted-T-shaped slots 8 in the side of the head 4 and have a limited movement therein, thereby permitting the cap 6 to be slightly rotated. The cap 6 may also have a slight vertical movement by means of the vertical part 9 of the slot 8. The bit 3 is formed with a right-hand thread or spiral groove, 10, and a left-hand thread or spiral groove, 11. Within the head 4 are loosely mounted on the bit 3 two ratchet-wheels, 12 and 13, the upper ratchet-wheel, 12, having a lug or pin, 14, engaging the right-hand spiral groove, 10, and the lower ratchet-wheel, 13, having a lug or pin, 15, engaging the left-hand spiral groove, 11. One of the spiral grooves is made smaller than the other, so that the lug moving in one groove will not catch at the intersection of the grooves. As shown in Fig. 4, the groove 11 is made smaller than the groove 10. The lugs 14 and 15 are also of such a length as to span the groove which each one crosses, and thereby also avoid being caught at the intersection of the grooves. The cap 6 is formed with a recess, 16, in which are mounted two pawls, 17 and 18, in different planes on the pins 19, the pawl 17 being adapted to engage the ratchet-wheel 12 and the pawl 18 the ratchet-wheel 13. Each pawl 17 and 18 is thrown into engagement with its ratchet-wheel by means of a coiled spring, 20, mounted on a pin, 21, in recess 16 of cap 6, and having its ends bearing against the outer ends of pawls 17 and 18.

The head 4 of handle 1 is formed with a recess, 22, opposite recess 16, and having beveled ends 23, to allow the end of one or the other of the pawls to pass freely into and out of said recess. By rotating the handle 1 on cap 6 the recess 22 is brought opposite to one or the other of pawls 17 and 18, and by the action of spring 20 the inner end of the pawl is thrown into recess 22, thereby moving its outer end into engagement with its ratchet-wheel. The other pawl is held out of engagement with its ratchet-wheel by its inner end bearing against the inner wall of head 4.

If desired, the ratchet-wheels 12 and 13 may be formed in one wheel instead of separately.

The bit 3 is provided at its inner end with a flange or button, 24, to limit its outward movement.

The operation of the screw-driver is as follows: The bit 3 is drawn out of the slot 2 in handle 1 into extended position, and the handle 1 is then rotated on cap 6, which is held in fixed position until pawl 18 is thrown into engagement with its ratchet-wheel 13, the pawl 17 being held out of engagement with its ratchet-wheel 12 by the pressure of the wall of head 4 against the inner end of the pawl. The end of the bit 3 is then engaged with the head of a screw, and downward pressure is brought to bear on handle 1, which causes the lug 15 on ratchet-wheel 13, held by pawl 18, to act on bit 3, causing the latter to travel upward into the slot 2, and by means of the left-hand spiral groove, 11, turning the bit 3 to the right, thereby securing a screw in place. To remove a screw, the pawl 18 is thrown out of engagement with its ratchet-wheel 13, and the pawl 17 is thrown into engagement with its ratchet-wheel 12 by rotating the handle 1 on cap 6.

The bit then being in extended position on handle 1, downward pressure is brought to bear on the latter, and the fixed lug 14, engaging right-hand spiral groove, 10, causes bit 3 to travel up into slot 2, the bit 3 turning to the left, and thereby unscrewing the screw.

If it is desired to use the invention as a simple screw-driver, it is simply necessary to rotate the handle 1 until the pins 7′ are in line with the vertical parts of slots 8, and then slide the cap 6 until the pins enter into the same. The handle 1, with the projecting end of the bit 3, may then be used as an ordinary screw-driver. The device may also be used as a ratchet screw-driver by rotating the handle 1 on the cap 6 to the right and left.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the longitudinally-slotted handle having a head, 4, a cap, 6, turning therein and provided with reversible pawls, of the bit extending through the cap into the recess and having right and left threads, and a ratchet having pins engaging the grooves in the bit, said pawls being adapted to be thrown into and out of engagement with said ratchet by turning the cap, substantially as set forth.

2. The combination, with the handle 1, having a longitudinal slot, 2, and head 4, slotted at 8, and having a recess, 22, on its inner side, the cap 6, having a recess, 16, registering with recess 22, pawls 17 18 in recess 16, a spring throwing the pawls inward, and pins 7′, extending through slots 8 into the cap, of the right and left threaded bit having a ratchet loose thereon and provided with pins engaging its two grooves, substantially as set forth.

3. The combination, with the handle 1, having longitudinal slot 2, and a head, 4, having inverted-T-shaped slots 8 9, the cap turning and sliding in said head, pawls carried by said cap, and pins passing through the inverted-T shaped slots into the cap, of the right and left threaded bit having a loose ratchet provided with pins engaging its two grooves.

4. In a screw-driver, the longitudinally-slotted handle 1, having a head, 4, recessed at 22 on its inner face and having inverted-T slots 8 9, and the rotary and sliding cap 6, having a recess, 16, registering with the recess 22, spring-actuated pawls pivoted in said recess 16, with their inner ends extending into recess 22, and the pins 7′, passing through said slots 8 9 into the cap, substantially as set forth.

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Witnesses:
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