

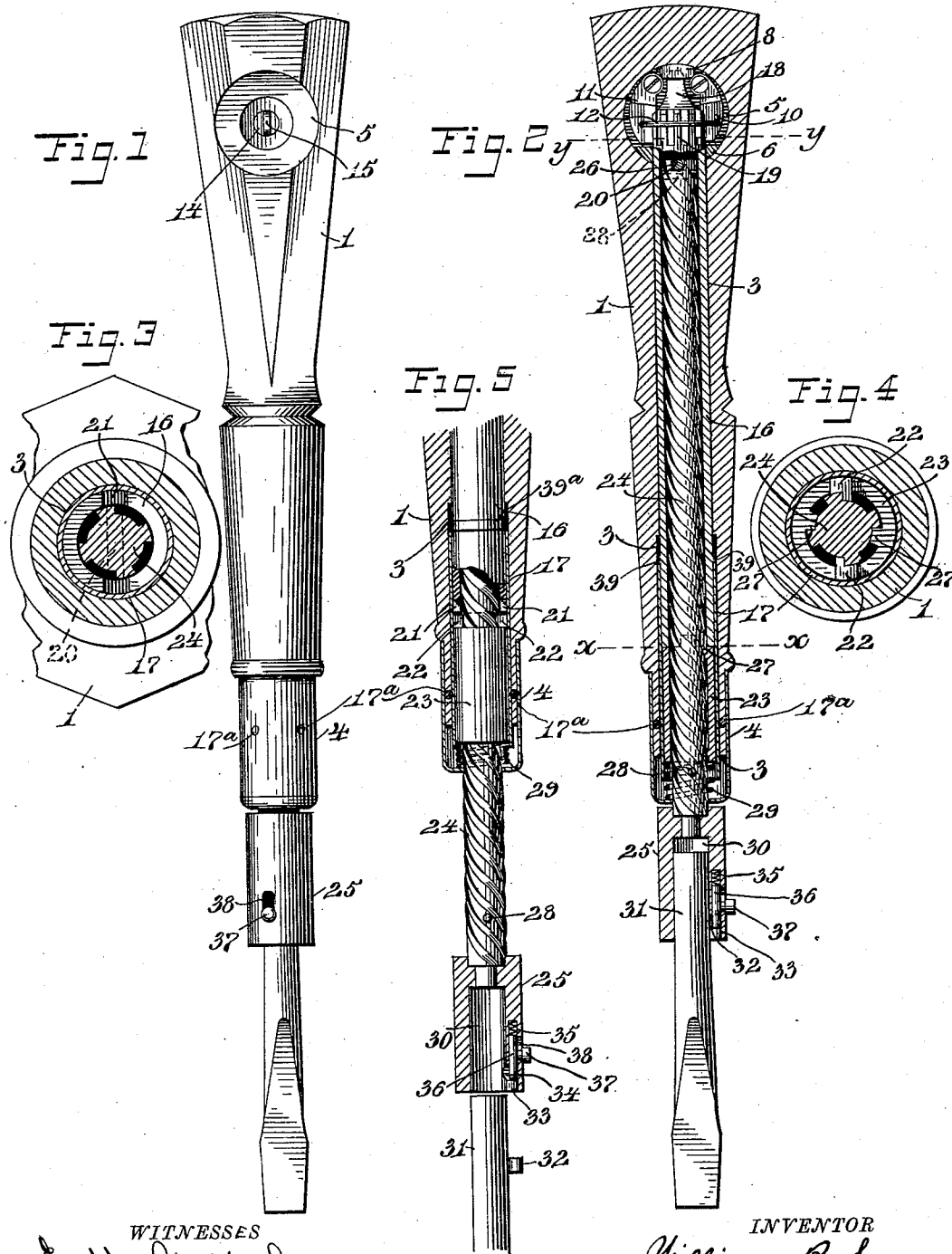
(No Model.)

2 Sheets—Sheet 1.

W. B. SWAN.
TOOL HANDLE.

No. 468,969.

Patented Feb. 16, 1892.



WITNESSES
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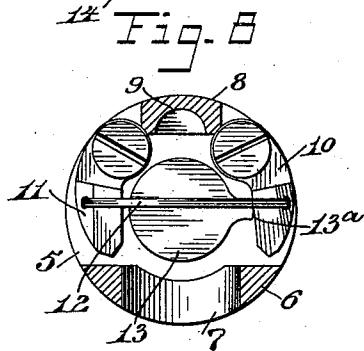
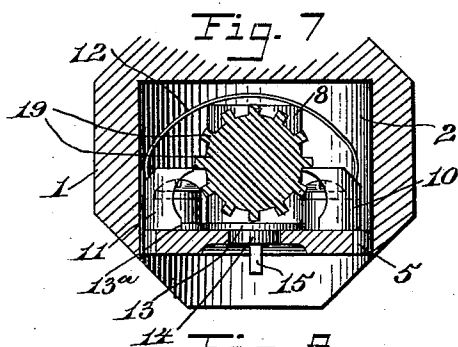
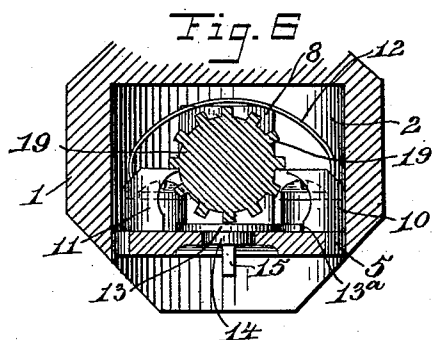
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2 Sheets—Sheet 2.

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TOOL HANDLE.

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WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM B. SWAN, OF SEYMOUR, CONNECTICUT.

TOOL-HANDLE.

SPECIFICATION forming part of Letters Patent No. 468,969, dated February 16, 1892.

Application filed June 1, 1891. Serial No. 394,896. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. SWAN, a citizen of the United States, residing at Seymour, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Tool-Handles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide a simple, inexpensive, and durable tool-handle which shall be adapted for general use, but more especially as a handle for screw-drivers, gimlets, &c., and which shall combine with the features of an ordinary simple handle a spiral speed-driver and both a right and left ratchet-driver.

With these ends in view I have devised the simple and novel construction which I will now describe, referring by numerals to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of the handle complete with a screw-driver locked in place therein, the hand-piece being pressed down to its extreme lowered position and wholly inclosing the spiral; Fig. 2, a longitudinal section; Fig. 3, a section on an enlarged scale on the line *xx* in Fig. 2, looking up; Fig. 4, a section on the same line, looking down; Fig. 5, a partial sectional view corresponding with Fig. 2, showing the hand-piece partially withdrawn from the chuck and spiral, as in use, the tool being withdrawn to show the construction of the locking device; Fig. 6, a section on the line *yy* in Fig. 2, looking up, showing the left pawl in engagement with the ratchet; Fig. 7, a similar view showing the right pawl in engagement with the ratchet; and Fig. 8 is a detail plan view of the pawls, the plate by which they are carried, the operating-cam, and the spring, the two guides extending from the plate being in horizontal section.

1 denotes the hand-piece or handle proper, which may be of any ordinary or preferred design, the upper portion of the hand-piece shown in the drawings being octagonal in cross-section.

2 denotes a transverse recess in the upper portion of the handle, which extends inward

from one side, and 3 a longitudinal recess extending from the lower end of the handle and intersecting the transverse recess. At the lower end of the hand-piece is the usual ferrule 4.

5 denotes a plate fitting closely in recess 2 and having extending therefrom a guide 6, having a hole 7 through it, and a guide 8, provided with a socket 9, the purpose of which will presently be explained. 10 and 11 denote, respectively, right and left pawls pivoted to said plate, both of said pawls being normally thrown inward—that is, to their operative position—by a spring or springs 12. In the present instance I have shown a single curved spring engaging and controlling both pawls. When it is desired to use the handle upon the ratchet principle, either of the pawls may be thrown out of position by an operating-cam 13 upon the inner side of plate 5, said cam lying between the two pawls, as clearly shown, and being provided with a shank 14, which extends through plate 5 and is provided with finger-piece 15 for convenience in operation.

16 denotes a longitudinal sleeve in recess 3, which fits snugly in said recess, but is capable of rotation therein. The upper end of the sleeve passes through hole 7 in guide 6, the extreme upper end being reduced, as at 18, and resting in socket 9 in guide 8, in which it turns freely. In practice the upper end of this sleeve consists of a ratchet 19, which is preferably made solid and is engaged by one or both of the pawls in use. Within sleeve 16, and just below the solid upper end thereof, is a solid rib or cross-piece 20. At the lower end of the sleeve (see Figs. 3 and 5) are one or more recesses 21, which are engaged by corresponding lugs 22 on a sleeve 23, which for convenience I will term the "short sleeve." Sleeve 23 and the lower end of sleeve 16 are inclosed within and are held in place by an inner ferrule 17, which is driven tightly into the handle and may be locked in place, if preferred, by a pin 17^a or in any suitable manner. Sleeve 16 is provided with suitable holding-lugs 39, or, if preferred, with an annular rib 39^a, as in Fig. 5, to engage the inner end of ferrule 17, so as to retain said sleeve at all times in operative position, no matter in what position the handle may be placed.

By the terms "upper" and "lower" ends I refer to the position of the parts as seen in Figs. 1, 2, and 5, it being of course obvious that in use the handle will work equally well in any position. Within sleeves 16 and 23 is a spiral 24, at the lower end of which is rigidly secured a chuck 25, by which the tool to be used is carried. The upper end of the spiral is provided with a recess 26, which is adapted to receive cross-piece 20, so as to lock the spiral to the ratchet when the parts are in the position shown in Fig. 2. In this position of the parts, as the ratchet is also locked to the hand-piece by the pawls, it follows that when the hand-piece is turned the ratchet, spiral, and chuck will be turned thereby, thus causing the handle to operate as an ordinary simple handle, all of which will presently be fully explained. It will be readily understood that the spiral is wholly independent of sleeve 16, except when in the position shown in Figs. 1 and 2, in which cross-piece 20 is in engagement with recess 26. Sleeve 23, however, is provided with one or more lugs 27, which engage the grooves of the spiral, so that said sleeve 23 must either be rotated by the spiral or when said sleeve is locked to sleeve 16 by engagement of lugs 22 with recesses 21 it must cause the spiral to rotate. Near the upper and lower ends of the grooves of the spiral are stops 28, which are engaged by lugs 27, to limit the inward and outward movements of the spiral and to hold the parts in position after assembling. The upper stop appears only in dotted lines in Fig. 2. The lower stop, which is identical, shows clearly in Figs. 2 and 5.

29 is a coil-spring lying between the lower end of sleeve 23 and the end of the ferrule, which receives and cushions said sleeve when the upward movement of the hand-piece is made. The chuck is provided with a recess 30 to receive the shanks of tools. The shanks, which are denoted by 31, are each provided with an outwardly-extending lug 32. The chuck is provided at its lower end with a longitudinal groove 33, which intersects a short transverse groove 34, the latter groove being of just suitable size to receive and hold closely the lug 32 on the shank of a tool. The chuck is also provided with a longitudinal recess 35, which receives a spring-actuated pin or bolt 36. This pin is provided with a finger-piece 37, which extends through a slot 38 in the side of the chuck. Longitudinal groove 33 and longitudinal recess 35 register with each other, the lower end of the pin extending down into the groove, as clearly shown in Figs. 2 and 5. When it is desired to fix a tool in the chuck, the shank of the tool is inserted in recess 30, the lug 32 upon the shank lying in the groove 33. The tool is pushed in as far as possible, the lug 32 forcing pin 36 inward with it, and is then given a slight turn, which moves lug 32 into the transverse groove 34 and permits pin 36 to spring forward again past lug 32, thereby locking the

tool in the chuck. To remove a tool from the chuck, pin 36 is moved backward by means of the finger-piece, and the tool given a slight rotary movement to carry the lug 32 out of groove 34, after which it is drawn straight out.

The operation is as follows: Suppose that it is desired to use the handle as a speed-driver, cam 13 is turned by means of the finger-piece, so that the engaging portion of said cam, which I have denoted specifically by 13^a, is turned toward the front from the position shown in Fig. 8—that is to say, so that said engaging portion does not hold either of the pawls out of operative position, but leaves both pawls free to be moved inward by the spring into engagement with the teeth of ratchet 19. In this position of the parts when the hand-piece is moved outward sleeve 16 is drawn outward with it, disengaging lugs 22 on the short sleeve 23 from recesses 21 in the lower end of sleeve 16. It follows, therefore, the two sleeves being no longer connected and the hand-piece with sleeve 16 being drawn upward over the spiral, that sleeve 23, through the engagement of lugs 27 on said sleeve with the grooves of the spiral, must be rotated thereby, said sleeve 23, following sleeve 16 closely, being held in position by the ferrule and spring 29, there being ample distance, however, between said sleeves to prevent lugs 22 from engaging the recesses 21. The rotation of sleeve 23 will continue until the outward movement of the hand-piece is stopped by the engagement of the lugs 27 with the stops 28 at the upper end of the spiral. Should it be desired to turn in a screw, the operator engages the blade of the driver with the groove in the head of the screw, draws the hand-piece upward, as just described, and then forces it straight downward. When the downward movement of the hand-piece and sleeve 16 commences, lugs 22 upon sleeve 23 are forced into recesses 21 in the lower end of sleeve 16, thus locking the two sleeves together. As sleeve 16 can no longer rotate, it follows that downward movement of the hand-piece must cause said sleeve to impart rotary movement to the spiral, carrying with it the chuck and the driver and turning the screw in rapidly, the speed at which the screw is turned in depending, of course, upon the pitch of the thread of the spiral. Should greater power be required than can be obtained through the use of the spiral—as, for instance, in setting a large-sized screw—the handle is operated in the manner of an ordinary screw-driver when the hand-piece is down to its lowered position, as in Figs. 1 and 2, no special setting of the pawls being required.

Should it be required to use the tool as an ordinary ratchet-driver, as in turning in a screw, cam 13 is turned until the engaging portion 13^a has forced the left pawl out of engagement with the ratchet, leaving the right pawl in engagement therewith. This arrangement causes the tool to act as an ordinary ratchet-driver, the engagement of the right

pawl with the ratchet locking the ratchet against rotation independently of the hand-piece when turned toward the right, but leaving it disengaged from the hand-piece when the latter is turned toward the left. The operator, therefore, without removing his hand from the hand-piece, turns toward the right to drive the screw in, then turns the handle backward to the starting position, and then turns forward again, the right pawl slipping freely over the ratchet when the hand-piece is turned backward.

Suppose now that it is required to remove a screw that has been already driven. The operator by means of the finger-piece turns cam 13 until the engaging portion thereof forces the right pawl out of engagement with the ratchet, as shown in Figs. 6 and 8, leaving the left pawl in engagement therewith. This locks the hand-piece, ratchet, spiral, chuck, &c., together when the hand-piece is turned toward the left, but leaves the hand-piece disconnected from the ratchet when the hand-piece is turned toward the right. The handle thus becomes a ratchet-driver for the purpose of withdrawing screws. When the left pawl is thrown out of operative position, it is a ratchet-driver for the purpose of driving screws, and when both pawls are in engagement with the ratchet the handle becomes a spiral speed-driver.

I have only illustrated a single tool—*i. e.*, a screw-driver—in the drawings. It will of course be apparent, however, that gimlets or other tools may be substituted, if required, the handle being admirably adapted for use as a speed-driver for gimlets and small-sized bits.

Having thus described my invention, I claim—

1. In a tool-handle, a sleeve socketed in the hand-piece and having a ratchet and a cross-piece at one end and recesses 21 at the other end, and a spiral having a recess 26 at one end to engage the cross-piece and carrying a chuck at the other end, in combination with a sleeve 23, having lugs 22, adapted to engage the recesses in sleeve 16, lugs 27, which engage the grooves of the spiral, pawls adapted to engage the ratchet, and an operating-cam, whereby either pawl may be thrown out of engagement.

2. In a tool-handle, the combination, with a sleeve 16, socketed in the handle and having a cross-piece 20 at one end and recesses 21 at the other end, and a spiral having at one end a recess to receive the cross-piece and at the other end a chuck, of a sleeve 23, having lugs 22, adapted to engage the recesses in sleeve 16, and lugs 27, engaging the grooves of the spiral, and stops 28 near the ends of the spiral, which engage lugs 27 to limit the inward and outward movement of the spiral, substantially as described.

3. In a tool-handle, a sleeve 16, socketed in the handle and having a ratchet and cross-piece at one end and recesses 21 at the other

end, and a spiral having a recess 26 at one end, adapted to engage the cross-piece, and a chuck at the other end, in combination with a sleeve 23, having lugs 22, adapted to engage the recesses in sleeve 16, and lugs 27, which engage the grooves of the spiral, spring-actuated pawls which normally engage the ratchet, and an operating-cam, whereby either of said pawls may be retained out of operative position, substantially as described.

4. The combination, with the hand-piece having transverse and longitudinal recesses and a ferrule 4, a sleeve 16, having a ratchet 19, a cross-piece 20, and a recess 21 in the longitudinal recess, and a plate 5, having guides 6 and 8 for said sleeve in the transverse recess, of a spiral having at its upper end a recess 26, adapted to engage the cross-piece, and at its outer end a chuck, a sleeve 23, having lugs 22, adapted to engage recesses 21, and lugs 27, engaging the grooves of the spiral, spring-actuated pawls upon plate 5, which normally engage the ratchet, and an operating-cam which is adapted to retain either pawl out of engagement with the ratchet, so that the handle may be used as a spiral speed-driver or as a right or left ratchet-driver.

5. The combination, with the hand-piece having a ferrule 4 and sleeves 16 and 23, having lugs and recesses, as shown, said sleeve 16 having at its upper end a ratchet and a cross-piece, of a spiral having a carrying-chuck and a recess at its opposite end adapted to receive the cross-piece, spring-actuated pawls which normally engage the ratchet, an operating-cam whereby either pawl may be held out of engagement therewith, and a spring 29 between sleeve 23 and the ferrule, substantially as described.

6. In a tool-handle, the hand-piece and the spiral having a recess at its upper end and carrying a chuck at its lower end, in combination with sleeves 16 and 23, having lugs and recesses, whereby said sleeves engage each other, sleeve 16 having at its upper end a ratchet and a cross-piece and said sleeve 23 having lugs 27, which engage grooves of the spiral, and spring-actuated pawls adapted to engage the ratchet, so that when the hand-piece is lifted sleeve 16 is disengaged from sleeve 23, the spiral passing freely through sleeve 16 and imparting rotation to sleeve 23, and when the hand-piece is moved downward sleeves 16 and 23 are engaged and rotary movement is imparted to the spiral, substantially as described.

7. In a tool-handle, the hand-piece and the spiral having a recess at its upper end and carrying a chuck at its lower end, in combination with sleeves 16 and 23, having lugs and recesses, whereby said sleeves engage each other, sleeve 16 having at its upper end a ratchet and a cross-piece and said sleeve 23 having lugs 27, which engage the grooves of the spiral, spring-actuated pawls adapted to engage the ratchet, and an operating-cam whereby either pawl may be thrown out of

engagement, so that when the recess in the spiral is in engagement with the cross-piece and a pawl is thrown out of engagement the handle becomes either a right or left ratchet-
5 handle.

8. In a tool-handle, a sleeve 16, socketed in the hand-piece and having an annular rib and recesses 21, and a spiral carrying a chuck, in combination with a sleeve 23, having lugs 22,
10 adapted to engage the recesses in sleeve 16,

and lugs 27, which engage the grooves of the spiral, and an inner ferrule 17, which incloses sleeve 23 and is engaged by the rib on sleeve 16.

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

WILLIAM B. SWAN.

Witnesses:

DAVID F. BUSCH,
ROBERT HEALEY.