

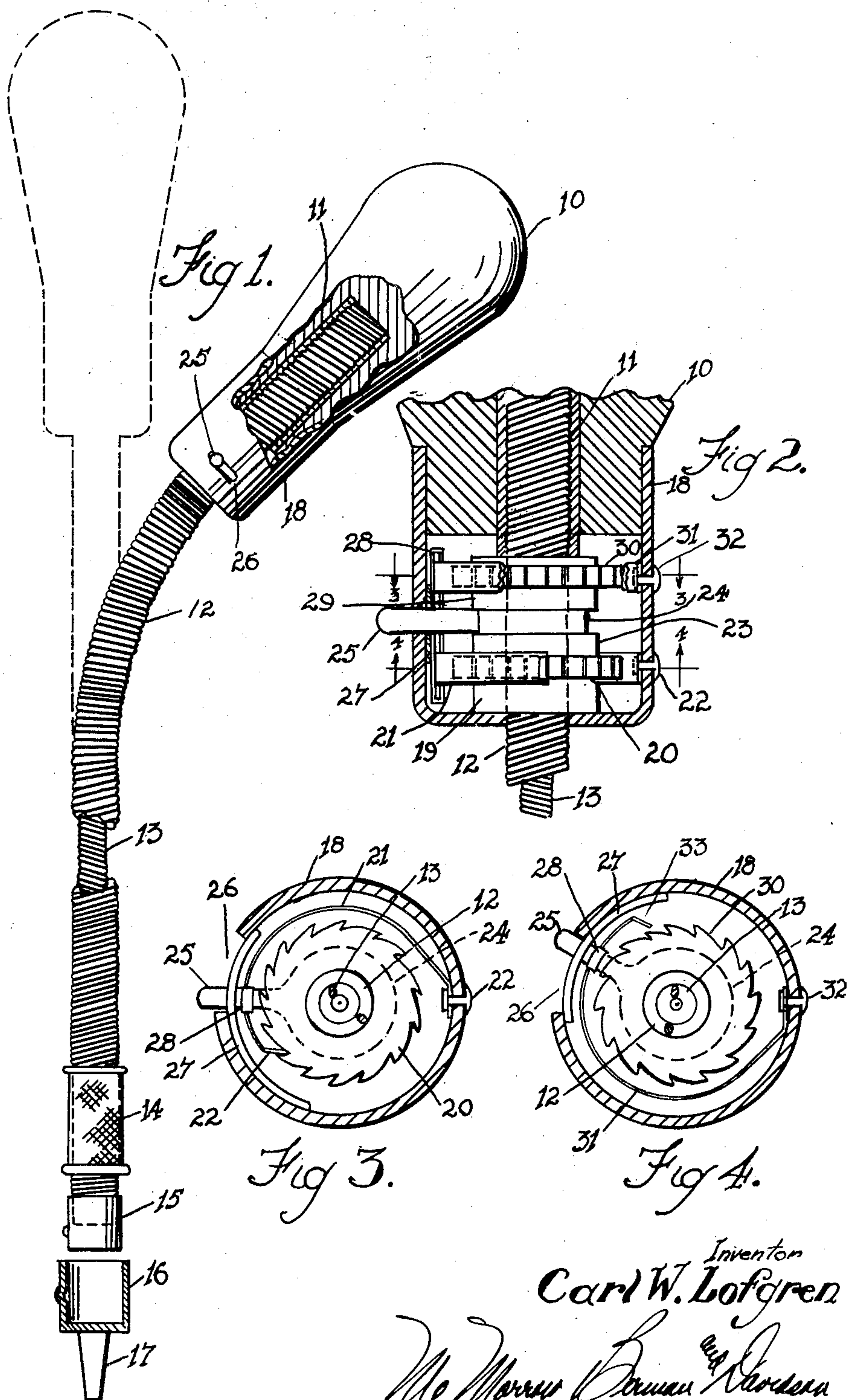
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REVERSIBLE RATCHET MECHANISM

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REVERSIBLE RATCHET MECHANISM

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1 Claim. (Cl. 74—575)

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My invention relates to tools and more particularly to screw drivers.

The object of my invention is to provide a screw driver having a flexible shank, so that it can be used for driving screws or manipulating nuts in spaces which would make it difficult to use common screw drivers.

Another object of my invention is to provide a screw driver having a flexible shank which is provided with a reversible ratchet handle to make it possible to tighten or untighten screws or nuts.

Other objects of my invention may appear in the following specification describing my invention with reference to the accompanying drawing illustrating a preferred embodiment of my invention. It is however to be understood that my invention is not to be limited or restricted to the exact construction and combination of parts described in the specification and shown in the drawing, but that such changes and modifications can be made, which fall within the scope of the claim appended hereto.

In the drawing:

Figure 1 is an elevational view of a screw driver according to my invention, a part of the flexible shank being shown as broken away and a part of the handle being shown in section.

Figure 2 is a partial vertical sectional view through the ratchet housing on the lower end of the handle.

Figure 3 is a sectional view taken on line 3—3 in Figure 2, and

Figure 4 is a sectional view taken on line 4—4 in Figure 2.

Referring now to the drawing in detail the tool according to my invention has a handle 10 in which a hole is provided adapted to receive a metal tube 11.

The tool has a shank consisting of an outer tightly wound helical spring 12 and an inner helical spring 13. One of said springs is wound in clockwise direction and the other one in counter-clockwise direction.

The metal tube 11 is firmly held in the handle 10 and serves as a bearing for the upper end of the flexible shank.

Adjacent the lower end of the shank a short metal tube 14 is slidably and rotatably mounted on the shank and serves as a finger grip to hold the tool in working position relative to the work. On the lower end of the flexible shaft a square or hexagon-shaped head 15 is rigidly mounted and is adapted to be seated in a complementary socket part 16, a screw driver 17 or like tool. Head 15

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may be detachably connected to socket 16 by a conventional ball latch or the like.

While a screw driver 17 is shown in the drawing, it is to be understood that other tools can be attached, for instance socket wrenches of various sizes or the like.

On the lower end of the handle 10 a housing 18 is attached and serves as a ferrule to the handle.

The flexible shank extends rotatably through the housing 18. An end thrust bearing 19 for the shank is located inside the housing resting on the bottom thereof. Just above this bearing a ratchet wheel 20 is rigidly mounted on the shank. A spring 21 preferably made from straight tempered spring steel is fastened to the inside of the housing 18 by means of a rivet 22 or the like. It is arranged on the same transverse plane as the ratchet wheel 20 and partly surrounds the same. The free end of the spring is bent inwardly as shown at 22 to provide a pawl.

A washer or spacer 23 is located above the ratchet wheel 20 and surrounds the shank and on top of this spacer a ring 24 is arranged around the shank. A lever 25 extends radially and outwardly from this ring and is integrally formed therewith. It extends through a horizontally arranged slot 26 in the circumferential wall of the housing 18. Inside the housing a curved shield 27 is rigidly attached to the lever and closes the slot 26. The lever can be pivoted about the shank to the extent of the length of the slot 26.

Inwardly of the shield 27 a slotted guide or retainer 28 is securely fastened to the lever 25 and extends above and below the lever.

In top of the lever ring 24 a second spacer 29 is arranged and just above this spacer a second ratchet wheel 30 is rigidly mounted on the shank. On the same transverse plane as the second ratchet wheel 30 a second spring 31 is firmly fastened on the inside of the housing 18 by means of a rivet 32 and partly surrounds the second ratchet wheel 30. The tip end 33 of the second spring 31 is bent inwardly as shown in Figure 4 to comprise a pawl.

The two springs 21 and 31 extend through the slot in the guide 28. The teeth of the first ratchet wheel 20 are arranged to point in clockwise direction and the teeth of the second ratchet wheel 30 in counterclockwise direction.

The two springs 21 and 31 have the tendency to straighten out, that means to keep the respective tip ends out of engagement with the respective ratchet wheels. When the lever 25 is moved counterclockwise in Figure 1 so that it will be located in the position shown in Figure 3, the

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guide 28 will force the tip end 22 of the first spring 21 into engagement with the first ratchet wheel 20 and will permit the tip end 33 to disengage the second ratchet wheel 30 so that the shank can be rotated by the handle 10 in counter-clockwise direction and the handle can be rotated freely on the shank in clockwise direction. By moving the lever 25 in the position shown in Figure 4 spring tip 22 will swing outwardly and spring tip 33 will be urged into engagement with the second ratchet wheel 30 so that the action will be in the opposite direction to the one described above.

Having described my invention I claim as new and desire to secure by Letters Patent:

In a tool having a shank and a handle freely rotatable on said shank, ratchet means operatively connecting said shank to said handle for rotating the shank in clockwise and counter-clockwise directions, said means comprising a ratchet wheel fixedly carried by said shank, a second ratchet wheel arranged above and spaced from said first-named ratchet wheel and fixedly carried by said shank, a ring provided with an outwardly-projecting lever rotatably mounted on said shank intermediate said first and second-named ratchet wheels, a flat spring having an end secured to said handle and having its other end so formed as to provide a pawl, said spring extending in a counter-clockwise direction about said first-named ratchet wheel and having its pawl adapted to engage the teeth of the latter wheel, a second flat spring having an end secured to said handle and having its other end so formed as to provide a pawl, said second-named spring extending in clockwise direction about said sec-

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ond-named ratchet wheel and having its pawl adapted to engage the teeth of the latter wheel, and a slotted guide secured to said lever and extending above and below the latter, each of said springs extending through said slotted guide, whereby actuation of the lever of the ring in one direction causes the guide to move the pawl of one of the springs into engagement with the teeth of one of said ratchet wheels and to move the pawl of the other spring out of engagement with the teeth of the other of the ratchet wheels to permit the rotation of the shank in a clockwise direction and actuation of the lever of the ring in the opposite direction causes the guide to move the pawl of the other of said springs into engagement with the teeth of the other of the ratchet wheels and to move the pawl of the one of said springs out of engagement with the teeth of the one of said ratchet wheels to permit rotation of the shank in a counter-clockwise direction.

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