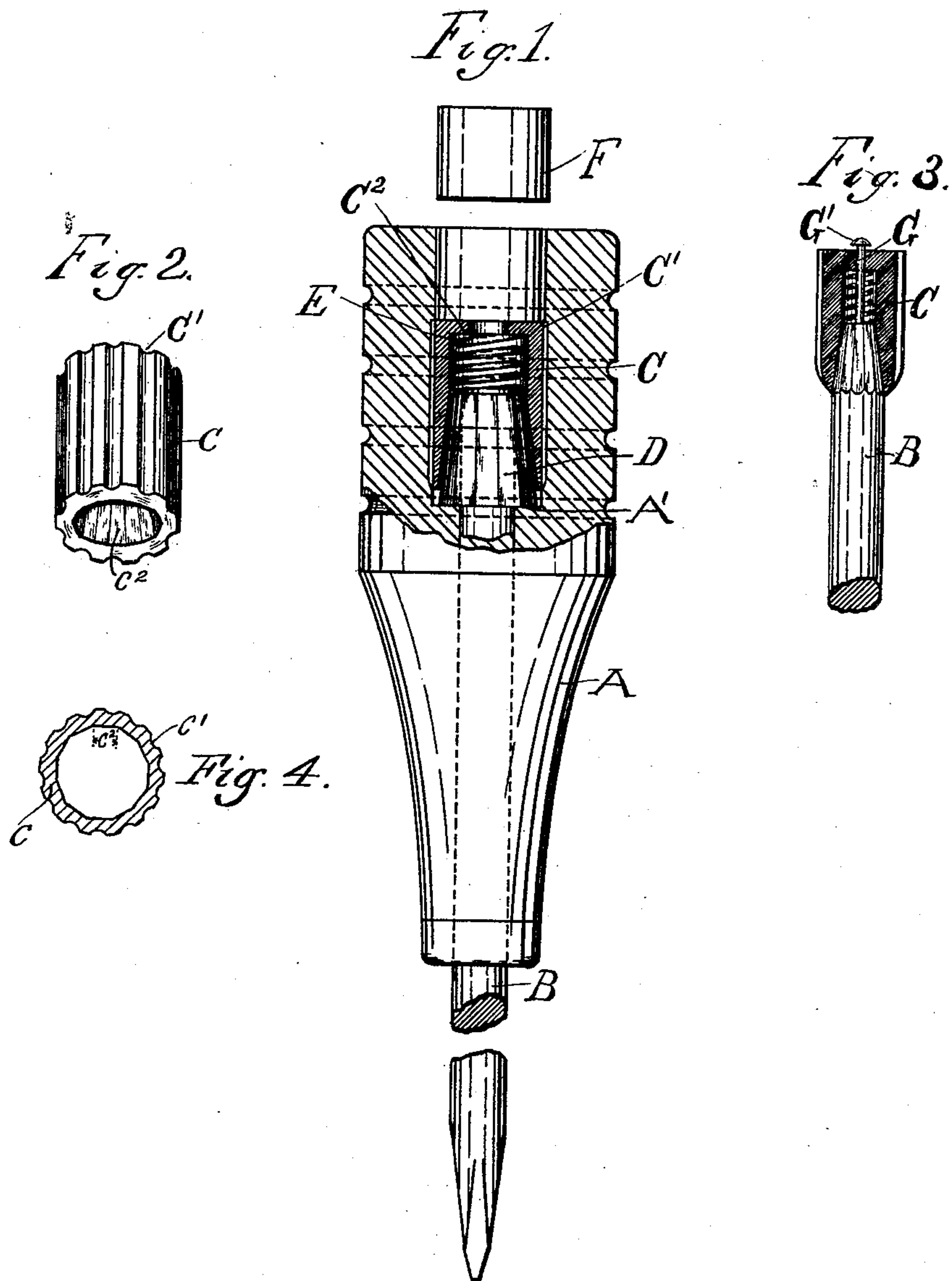


(No Model.)

F. CHANTRELL.
SCREW DRIVER.

No. 393,421.

Patented Nov. 27, 1888.



WITNESSES:
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FELIX CHANTRELL, OF READING, PENNSYLVANIA.

SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 393,421, dated November 27, 1888.

Application filed April 28, 1888. Serial No. 272,124. (No model.)

To all whom it may concern:

Be it known that I, FELIX CHANTRELL, a citizen of the United States, residing at Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Screw-Drivers; and I do 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 ap-
10 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates particularly to hand-
15 tools—such as screw-drivers—in which it is desired to rotate the handle with or without the shaft.

The object is to accomplish this in a more satisfactory and efficient manner, and at the
20 same time more economically than has heretofore been done. The means now in use to secure the desired results in tools of the kind referred to involve the use of a serrated or toothed surface arranged at right angles to the
25 axial line of the shaft, the separate parts being revolved together when the serrations or teeth on one surface are brought into engagement with corresponding serrations or teeth, a pivoted dog, or equivalent device on the
30 other. This construction becomes more or less complicated and expensive, and when the teeth or equivalents are sufficiently strong and present enough surface to prevent excessive wear a considerable longitudinal movement is
35 required to throw the parts into or out of engagement, and there is also an objectionable amount of circular lost motion before the teeth on one surface coincide with the corresponding recesses on the other.

40 In my device I discard the serrations or teeth above described and secure the requisite engagement between the revolving parts on the outer surface of a tapered shank end, a preferred construction on this principle being
45 illustrated in Figures 1 and 2 of the drawings, Fig. 1 being an elevation, partly in section, of a complete screw-driver, the handle and shaft being represented out of engagement, Fig. 2 giving an isometrical view of the handle-bush-
50 ing detached. Fig. 4 is a cross-section of the handle-bushing.

A represents a wooden handle, the external appearance of which does not differ from those ordinarily used for screw-drivers and similar tools. It is, however, bored centrally through
55 its entire length to two different diameters, the larger part of the hole being in the heavy part of the handle, while the smaller bore extends through its reduced part, leaving an interior shoulder or offset, A', where the two sizes con-
60 nect.

The shaft B is a round piece of rolled steel tapered and shaped at one end to suit a screw-slot. Its diameter is such as to loosely fit the
65 small bore of the handle, into which the plain shank end of the shaft is inserted until it projects beyond the heavy end of the handle. The cap-piece D, which is represented in the form of a frustum of a pyramid, the base or a paral-
70 lel section of which at any point of its height is a many-sided polygon without re-entering angles, and which is also formed with a hole suited to the size of the shaft, is then forced on or otherwise securely fastened to the shank
75 of the shaft, which is subsequently allowed to drop until the base of the cap rests upon the offset A' in the handle.

The handle-bushing C (as also the cap-piece D above described) may be cast of malleable
80 iron or other metal, the outside longitudinal corrugations, C', or their equivalent, as well as the interior shape, with flat faces C², corresponding with the outside surface of the cap D, being formed complete in the foundry, ex-
85 cept that a properly-shaped tool may be driven into it to remove sand and burrs and so insure its fit on the cap. The bushing is sufficiently
90 long to give room for a spiral spring, E, between the end face of the cap (when the latter is inclosed by the bushing) and the shoulder C² in the top part of the latter, which forms a seat for the spring.

The above-described bushing, which is of such an outside diameter as will tightly fit the
95 large bore of the handle, and is also slightly tapered or rounded at the bottom to permit of its being readily entered, with the spring E inclosed, is pressed into the handle, the surplus wood being compressed and forced into the grooves C' until the cap D is inclosed by
100 the bushing as far as possible without engaging with it when the base of the cap is pressed

against the offset A' by the spring. The plug F is then glued or otherwise fastened in the handle above the bushing, which latter is thus effectually prevented from pushing out or turning in it. This method of securing a sleeve or equivalent in the heart of the handle has been previously described and claimed in my pending application, Serial No. 267,664, and the means herein set forth for engaging the handle and the shaft is an improvement on my previous application, Serial No. 266,331.

The method of operating a tool constructed as above described is obvious. When applied to a screw-driver, as shown, the point being placed in the screw-slot, a moderate end pressure on the handle compresses the spring and permits the shank-cap to seat itself in the sleeve. When the handle is then rotated, the shaft and screw rotate with it, the flat sides and corners of the cap and sleeve, respectively, compelling them to turn together. On removing the longitudinal pressure the spring moves the handle just sufficiently to allow it to be returned without engaging the shaft, which remains stationary until the handle is again rotated in the same direction. The hand which grasps it need not be shifted.

The advantages of this general method of construction consist, as previously noted, not only in increased economy of manufacture, but also in more satisfactory working, consequent on the large surface of the shank which is thrown into engagement with the handle by a slight movement as compared with the use of the usual end serrations or teeth.

I do not wish to limit myself to the construction shown, as it is obvious that various modifications may be readily devised. Fig. 3 represents one equivalent form in which the cap-piece is dispensed with and the end of the shaft itself shaped to suit the sleeve, the latter being of smaller diameter than that shown in Fig. 1. The method here indicated of preventing the withdrawal of the shaft by means of a projecting stem, G, extending through the bushing and having a head, G', formed on the end of it, is similar to that described in my pending application, Serial No. 266,331.

What I desire to secure are the following claims:

1. In a screw-driver or similar tool, a driver-shaft having a tapered shank end of regular polygonal cross-section, in combination with a rotatable handle provided with a fixed bushing having its interior shaped to correspond with said shank end, and a spring, all adapted to operate substantially as set forth.

2. The driver-shaft having a cap-piece of regular polygonal cross-section secured to its shank end, in combination with a rotatable handle provided with a correspondingly-formed bushing adapted to engage said cap-piece, and a spring, all adapted to operate substantially as set forth.

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

FELIX CHANTRELL.

Witnesses:

GARRETT B. STEVENS,
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