

(No Model.)

F. CHANTRELL.
SCREW DRIVER.

No. 419,638.

Patented Jan. 21, 1890.

FIG. 1.

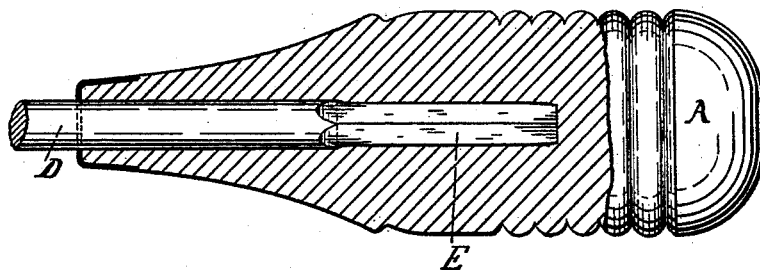


FIG. 2.

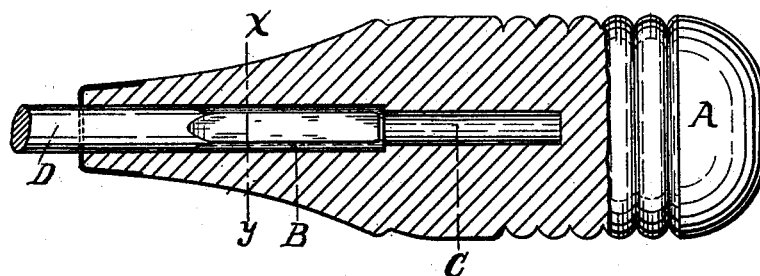


FIG. 3.

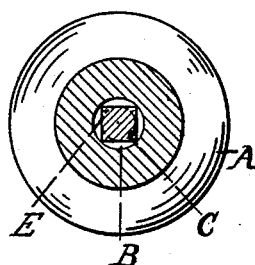
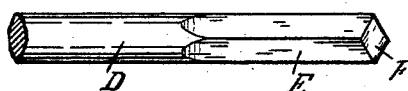


FIG. 4.



WITNESSES

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SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 419,638, dated January 21, 1890.

Application filed October 18, 1888. Serial No. 288,422. (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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

15 The object of this invention is to produce a screw-driver or similar tool which will combine in its construction economy of manufacture and an entirely satisfactory connection of the shaft or bit and handle.

20 The invention consists in the improved manner of effecting this connection herein-after set forth.

Figure 1 shows the shaft secured to the handle, the latter being in section as far as the shaft extends into it. Fig. 2 is a similar view of the handle, showing the shaft entered but not forced home. Fig. 3 is a cross-section through xy of Fig. 2, looking toward the upper end of the handle. Fig. 4 is a perspective view of the shaft alone.

30 A represents any suitable handle. The lower end toward the point of the shaft is smaller in diameter than the upper end, which is seized by the hand in operating the tool. This feature in the form of the handle is common to all screw-driver handles, it being evidently advantageous. From the lower and smaller end of the handle a central bore B, of the same diameter as the round body of the shaft D, reaches some distance into the handle, and a smaller bore C extends still farther toward and enters the upper and heavier end of the handle. The diameter of this smaller bore is determined by the size of the polygonal shank end E of the shaft. This shank end is preferably formed by merely flattening the round bar from which the shaft is made to a square section, the diagonal of which is equal to the diameter of the body of the shaft. It is not tapered, but is of uniform section. It will be noticed that

the bore B is of a greater length than the polygonal shank end E of the shaft.

In Fig. 3 the squared shank end is represented in position, and the relative proportions of the bores and the shaft-body and shank are shown. It will be noticed that the larger bore is represented by a circumscribed circle and the smaller bore by an inscribed circle with respect to the cross-section of the shank end. It is only essential, however, that the diagonal of the shank end, whether of square or other polygonal section, shall be greater than the diameter of the smaller bore, and that the round body of the shaft shall fill the larger bore. The outer bore B being of a greater length than the polygonal shank end of the shaft or bit, it is obvious that when the shank of the shaft is being introduced into the bore of the handle the round body will enter the larger bore before the extremity F of the shank touches the smaller bore. The advantage of this construction is that the shaft is held straight and guided in the larger bore when the shank starts to enter the smaller bore. When the shaft is forced into the smaller bore, both the round and polygonal parts of the shank are tightly hugged by the material of the handle, effectually preventing its withdrawal, and the corners of the polygonal part as effectually preclude its turning in the handle.

One essential feature of my invention consists in securing the polygonal shank of the shaft, through which the torsional strain is conveyed to the handle, in the central part of the latter instead of in the small end, this part being best able to bear the strain, and not likely to be split by forcing the corners of the shank into it. This splitting strain is entirely avoided at the small end of the handle, yet the fit of the round body of the shaft in this part of the handle materially assists in strengthening the connection, and at the same time prevents any side strain from coming on the squared shank, as would be the case if the round body did not enter the handle, as shown. Consequently the connection is not loosened by the exigencies of service, as is the case with the rectangular and tapered shank or tang ordinarily used.

What I claim is—

1. A screw-driver or similar tool consisting of a round shaft or bit formed with a shank end of polygonal section, and a handle having its lower portion of a less diameter than its upper or grasping portion and bored from said lower portion to two sizes, the larger of said bores being equal in diameter to the body of the shaft and longer than said polygonal shank end, and the smaller bore less than the diagonal of said polygonal section, and entering said grasping portion of the handle, said shaft and handle being united substantially as set forth.
2. A screw-driver or similar tool consisting of a round shaft or bit formed with a shank end of polygonal section, substantially as described, and a handle bored from the smaller end to two sizes, the larger bore being equal in diameter to the body of the shaft and longer than said polygonal shank end, and the smaller bore less than the diagonal of said polygonal section, the shaft and handle being united substantially in the manner set forth.

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

FELIX CHANTRELL.

Witnesses:

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CYRUS M. STRUNK.