

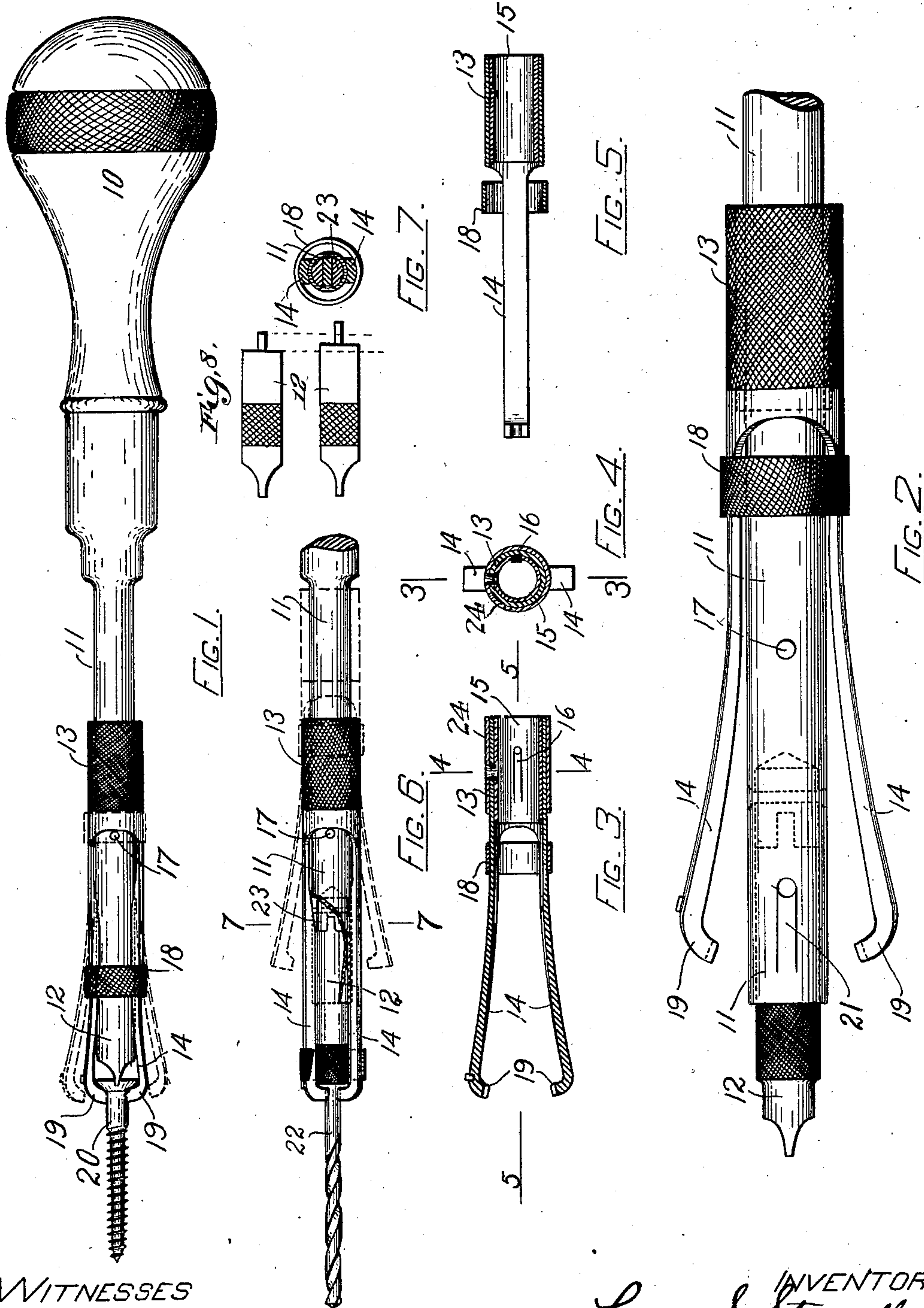
No. 730,804.

PATENTED JUNE 9, 1903.

L. S. STARRETT.
SCREW DRIVER.

APPLICATION FILED OCT. 31, 1901.

NO MODEL.



WITNESSES
H. W. Ladd
C. F. Stone.

INVENTOR
Leroy S. Starrett
by N. W. French
Attorney

UNITED STATES PATENT OFFICE.

LAROE S. STARRETT, OF ATHOL, MASSACHUSETTS, ASSIGNOR TO THE L. S. STARRETT COMPANY, OF ATHOL, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 730,804, dated June 9, 1903.

Application filed October 31, 1901. Serial No. 80,620. (No model.)

To all whom it may concern:

Be it known that I, LAROE S. STARRETT, of Athol, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Screw-Drivers, of which the following is a specification.

This invention consists, primarily, of a screw-driver provided with an adjustable pair of inherently elastic fingers suitably compressed and adapted to hold the head of the screw about to be inserted in firm contact with the tip of the screw-driver shank and by a rearward movement of the compressing device to release the screw when desired. These fingers are of tempered sheet metal and preferably formed integral with a sliding sleeve which surrounds the tool-shank, such sleeve having an internal bushing provided with a yielding friction device adapted to normally hold the sleeve and fingers at any point desired. The sleeve will be externally milled or inclosed by a milled thimble riveted to it and its bushing. A sliding clasp or ring surrounding the fingers forces them inwardly to engage the screw or releases them when the movement is reversed. A stop projecting from the shank engages the sleeve, preventing it from moving too far, and a like stop on one finger near its tip tends to prevent loss of the sliding ring.

I prefer to make the tool-shank tubular at its free end—that is, with a terminal socket and locking device into which may be inserted successively tool-tips having stems of uniform diameter, each engaging the locking device, and dissimilar outer ends with slightly-varying lengths adapted to fit materially different sizes of screws or tools to form holes for inserting them. The elastic fingers and the clasp hold the screw-head against the point of the removable tool-tips in operative position, the fingers having inwardly-extending ends concaved to fit the screw held on drill-stem shoulder, so that considerable force may be applied and the screw or drill held firmly and withdrawn when required. The fingers cling to the beveled under side of the screw-head and hold the tip engaged in the slot of the screw, and since the projecting stop always checks the advance of the fingers at a given point, while screw-heads vary in

thickness with their size, I make the tips for small-sized screws slightly longer than those designed for large screws, because the latter have thicker heads. For brad-awls and twist-drills to make holes for inserting screws the stem of the perforating-tool is an enlarged axial prolongation, an exact duplicate of the stem of the exchangeable screw-driver tips. The elastic fingers seize the tool by the shoulder where it is joined to said prolongation.

In the drawings, Figure 1 is a side view of one of my improved screw-drivers, showing in full lines the screw held against the shank-tip by the elastic fingers and movable ring, dotted lines indicating the position of fingers when the ring is moved rearwardly without moving the sleeve. Fig. 2 shows, on an enlarged scale, the sleeve, fingers, and ring applied to a tool-shank with tubular terminal socket and a removable tip, the tip-stem and locking device being indicated by dotted lines. Figs. 3, 4, and 5 are sectional views of the sleeve, fingers, and ring. Fig. 6 shows the socketed shank with fingers and ring holding a twist-drill having an enlarged stem engaging the socket and locking device indicated in Fig. 2. Fig. 7 is a transverse section taken on line 7 7 of Fig. 6. Fig. 8 is a side view of two of the removable tips of different lengths.

10 represents the tool-handle, 11 the shank or body of the tool, and 12 the operative tip which engages in the slot or "nick" in the screw-head, as shown in Fig. 1. The tips may be continuous and integral with the shank, as in Fig. 1, or the shank may be made with a socket at its outer end and provided with a suitable locking device, so that tips of various forms may be inserted therein, as indicated in Figs. 2, 6, and 7.

13 is a metallic sleeve surrounding the tool-shank and provided with two or more elastic fingers 14, projecting forward on opposite sides of the shank. Figs. 3, 4, and 5 show a tubular bushing or lining 15, secured within sleeve 13 and formed with a suitable friction-tongue 16, pressing inwardly against the shank to hold the fingers in any adjusted position. A stop-pin 17, projecting slightly from the shank, limits the forward movement of the sleeve and fingers at the proper point.

18 is a sliding ring surrounding the fingers and movable lengthwise of them.

The fingers 14 have terminal inward extensions 19, with concave faces to fit upon the beveled undersurface of the head of the screw, which is thereby drawn backward and held firmly against the tool-tip. The fingers are made thin near their junction with sleeve 13 and normally spring outwardly near their free ends. When it is desired to insert a screw 20, its nicked head is applied to the tip 12, while the fingers are spread and advanced, as in dotted lines, Fig. 1. Then the ring 18 is moved forward, drawing the fingers inwardly until their inward extensions 19 engage the head of the screw, as seen in full lines in Fig. 1.

When not required for use in holding the screw or drill, the sleeve and fingers are moved back from the tip, as shown in Fig. 2 and in dotted lines in Fig. 6. At such times the removable tip will be held in the shank-socket frictionally, preferably by a slender tongue 21, integral with the socket-wall, as in Fig. 2, pressing inwardly against the tip-stem.

Fig. 6 illustrates a special adaptation of my invention. The twist-drill 22 has an enlarged stem 12 just fitting the terminal socket of the shank 11 and engaging the locking-piece 23 therein. The spring-fingers 14 by their terminal extensions 19 seize and hold the drill by its shouldered enlargement, as in Fig. 1 they are seen to hold the screw 20 by its head. Both are held with great firmness. When a hole has been bored, the fingers serve to withdraw the drill from it. The drill is then removed from the shank, and a tip, as in Fig. 2, substituted, and the screw held thereto, as illustrated in Fig. 1.

In constructing my new screw-driver attachment I propose to strike up the fingers and sleeve from a piece of sheet metal, form the sleeve, shape and temper the fingers, then apply a milled thimble 24 around the sleeve, and by a single rivet unite the thimble, sleeve, and bushing, the thimble being indicated in Figs. 3 and 4.

I am aware that rigid screw-holding fingers pivoted on a sliding collar compressed by an inclosing tube or ring and each furnished with a spring riveted in place and interposed between it and the tool-shank have heretofore been applied to screw-drivers. Such devices I disclaim. My improvement dispenses with hinges, rigid fingers, auxiliary springs,

and rivets for securing the springs, and I simplify and perfect the device by making the fingers of elastic sheet metal integral with the sliding sleeve, which has an automatic friction device and is controlled by a positive stop. The detachable tips used with these features of my present invention are made of slightly-varying lengths, as stated, to compensate for the difference in thickness of screw-heads for which they are respectively adapted.

I claim as my invention—

1. A screw-holding attachment for screw-drivers comprising a sleeve having integral spring-fingers with inward terminal extensions, in combination with a bushing fitting within said sleeve and adapted to fit closely to the screw-driver shank, and having an integral, inwardly-struck-out spring-tongue, causing sufficient friction on said shank to maintain said attachment where placed on said shank, substantially as set forth.

2. In a screw-driver, the handle and the shank having a tubular terminal socket and a plurality of detachable tips of uniform diameter fitting and suitably locked therein, such tips being severally adapted for screws of different sizes and made of slightly-varying lengths, to compensate for the difference in thickness of screw-heads, in combination with a sliding sleeve having a plurality of screw-holding fingers with beveled inner faces, a compressing and releasing device for the fingers, and a positive stop limiting the forward movement of the sleeve and fingers, substantially as set forth.

3. In a screw-driver, the handle, the shank having a fixed projecting stop, a tubular terminal socket, and detachable tips suitably secured therein, such tips being adapted, terminally, for different-sized screws, and those for small screws being slightly longer than those fitting the large sizes, in combination with a sliding sleeve formed with elastic fingers having inward terminal extensions with beveled inner faces, and with a bushing and friction device within such sleeve to hold the sleeve and fingers in their retracted or advanced position, substantially as set forth.

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

LARROY S. STARRETT.

Witnesses:

FRANK E. WING,
WILLARD G. NIMS.

It is hereby certified that in Letters Patent No. 730,804, granted June 9, 1903, upon the application of Laroy S. Starrett, of Athol, Massachusetts, for an improvement in "Screw-Drivers," an error appears in the printed specification requiring correction, as follows: In line 43, page 1, the words "held on" should read *head or*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of June, A. D., 1903.

[SEAL.]

E. B. MOORE,
Acting Commissioner of Patents.