

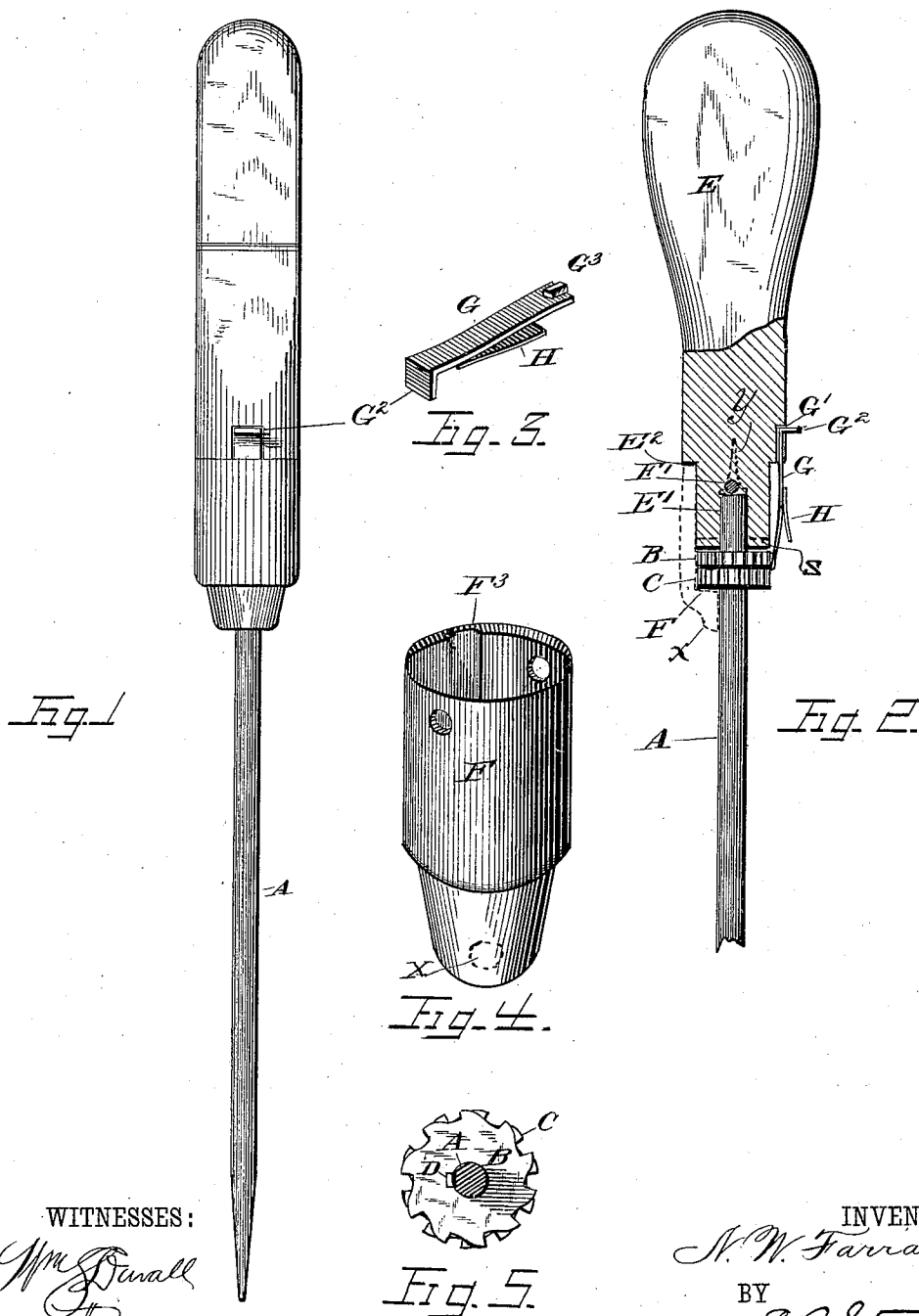
(No Model.)

N. W. FARRAND.

SCREW DRIVER.

No. 320,920.

Patented June 30, 1885.



WITNESSES:

Wm Dunall
J. L. Fracker



Fig. 5.

INVENTOR

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ENCE A. FARRAND, OF SAME PLACE, AND ELLA U. CLARK, OF EAST
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SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 320,920, dated June 30, 1885.

Application filed December 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL W. FAR-
RAND, a citizen of the United States, residing
at Westfield, in the county of Chautauqua and
5 State of New York, have invented certain new
and useful Improvements in Screw-Drivers,
of which the following is a specification, ref-
erence being had to the accompanying draw-
ings.

10 This invention has relation to ratchet screw-
drivers, and involves improvements of that
particular class of ratchet screw-drivers which
comprise two oppositely-arranged ratchets
mounted rigidly upon the shank of the blade
15 and a shifting-pawl adapted to be transferred
from one ratchet to the other, whereby the
blade may be driven in opposite directions
without removing the hand from the handle
of the driver; and the invention consists in
20 certain features of construction hereinafter
described, and specifically set forth in the
claims.

Referring to the drawings, Figure 1 is an
elevation of the complete screw-driver con-
25 structed in accordance with my invention;
Fig. 2, a partial section of the same. Fig. 3
is a perspective of the pawl and its spring;
Fig. 4, a similar view of the ferrule, and Fig.
5 a plan of the ratchets on an enlarged scale.
30 Like letters indicate like parts in all the
figures.

Near the upper end of the blade A are se-
cured two ratchets, B C, in close proximity to
each other, the teeth of the one presenting
35 their working-faces in an opposite direction
to that of the teeth of the other, as clearly
shown in Fig. 5. These ratchets may be formed
in one piece with the shank or blade, or they
may be placed thereon when heated and al-
40 lowed to shrink, so as to firmly embrace the
blade, or they may be secured to the blade by
means of a key, D, shown in Fig. 5. The up-
per end of the shank is extended into a recess,
E', formed in the lower end of the handle E,
45 where the shank comes in contact with the
rod, screw, or bolt F', which serves to retain
the ferrule F upon the handle, and also serves
as a bearing for the upper end of the shank,
thus giving a firm resistance to the pressure

brought to bear upon the driver in use, as well
50 as a bearing offering little resistance to the
revolution of the blade independently of the
handle. The lower end of the handle is shoul-
dered, as at F², for the reception of the ferrule,
and it is grooved, as at G', for the reception of
55 the upper end of the pawl G. The pawl G is
made, preferably, of spring-steel, and is so bent
as to normally stand at its central portion out-
wardly from the handle, and to project into a
groove, F³, formed upon the inner surface of
60 the ferrule. The upper end of the pawl is
bent at a right angle to its body portion to
form a thumb-piece, G², by which means the
pawl may be reciprocated from one ratchet to
the other.

65 Although not absolutely essential, a spring,
H, may be arranged outside of the pawl to
bear against the bottom of the groove F³ in
the ferrule, to further insure a firm contact of
the pawl against the ratchets, and to prevent
70 its accidental passage from the upper ratchet
to the lower one when in use. In this instance
the pawl is provided with a tooth, G³, adapted
to mesh with the teeth of either of the ratchets.

75 The ferrule may be at its lower end of a
sufficient bore to permit the passage there-
through of the blade; but in this instance it is
of a bore large enough to receive only the
body portion of the blade, which is cylindrical,
as shown by dotted lines X in Figs. 2 and 4,
80 so that in the assembling of the parts of the
driver the blade or shank is first introduced
into the ferrule from below, and the ratchets
afterward secured to the shank or body of the
blade. The pawl G is then arranged in the
85 groove of the ferrule, the handle E inserted,
and all of the parts firmly bound together by
the use of a single rivet, rod, screw, or bolt, F'.

This being the construction, the operation is
as follows: To insert a screw, the pawl is raised
90 by the thumb-piece into contact with the up-
per ratchet, the pressure applied in partially
rotating the handle, and a new stroke is pre-
pared for by a return motion of the hand, in
which motion the pawl rides up the inclines
95 of the teeth from left to right, and additional
motion is given to the screw by the following
partial rotation of the handle. In withdraw

ing the screw the same operation takes place so far as regards the handle; but the pawl is forced by means of its thumb-piece downwardly and directly in contact with the lower ratchet, the reversed teeth of which permits the pawl to ride over and take into the same to operate the driver for withdrawing the screw.

By the construction above described the number of pieces heretofore required in drivers of this class is reduced. The construction is simplified, greater strength is secured by reason of less cutting away of the handle, and the ferrule serves, in addition to its usual function, to retain the parts in operative position without the employment of other devices, and provides a metal bearing for the shank below the ratchets on the shank and for the under surface of the lower ratchet, (see dotted lines, Fig. 2,) while a similar bearing above the ratchets is provided by the rivet, screw, or bolt which secures the ferrule to the handle, so that in use pressure exerted upon the driver is resisted in all directions by a metal bearing, thus giving great strength and relieving the wooden portions of the handle from undue wear.

Instead of the rivet, bolt, or screw F', to form a metal bearing for the upper end of the shank, a tack or other piece of metal, Y, dotted lines, Fig. 2, may be seated in the bottom of the recess E' in the handle E, or a washer, as Z, dotted lines, Fig. 2, may be placed between the end of the handle and the upper ratchet, B.

In screw-drivers of this class, unless provision is made to reduce to the minimum the friction of the handle upon the blade, but few turns can be taken with removing the hand from the handle to take a new hold. Especially is this the case when a screw is being inserted and before it becomes sufficiently entered to resist following the handle in its backward rotation. Now, by providing a metal bearing of limited contact surface directly central and immediately over the extreme upper end of the blade, I reduce the friction of the handle and blade upon each other to a minimum, at least to such an extent that obviates giving motion to the blade, which would occur by arranging my rivet alongside thereof and in a circumferential groove there-

in, especially when such an arrangement is supplemented by a coiled spring within the recess, bearing constantly and torsionally against the upper end of the blade. By forming the recess in the wooden or other cheap material of the handle and inserting a separate metal bearing, I obviate the complicity and expense of an additional metal recessed part, into which the spindle or holder of the blade is fitted to bear otherwise than exactly centrally therein.

Having described my invention, its advantages, and its operation, what I claim is—

1. In a ratchet screw-driver, the combination, with the blade provided with oppositely-arranged ratchets, of a handle recessed for the reception of the upper end of the blade, and having within the recess a central metal bearing for the extreme upper end of the blade, substantially as specified.

2. In a ratchet screw-driver, the combination, with the blade provided with oppositely-arranged ratchets, of a handle recessed and provided with a separate central metal bearing for the upper end of the blade, and a ferrule provided with a bearing for the blade, substantially as specified.

3. In a ratchet screw-driver, the combination of the blade provided with oppositely-arranged ratchets, the handle provided with a recess and a metal bearing therein for the blade, and a groove for the reception of the pawl, and the ferrule provided with a groove for the pawl and with a bearing for the blade, substantially as specified.

4. In a ratchet screw-driver, the combination, with the blade and ferrule, of a handle recessed for the reception of the upper end of the blade, and a rivet, screw, or bolt arranged to serve as a separate central metal bearing for the extreme upper end of the blade and to retain the parts in operative position, substantially as specified.

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

NATHANIEL W. FARRAND.

Witnesses:

C. A. KINGSBURY,
H. R. SMITH.