

No. 688,799.

Patented Dec. 10, 1901.

P. K. STERN.
SCREW DRIVER.

(Application filed Nov. 19, 1900.)

(No Model.)

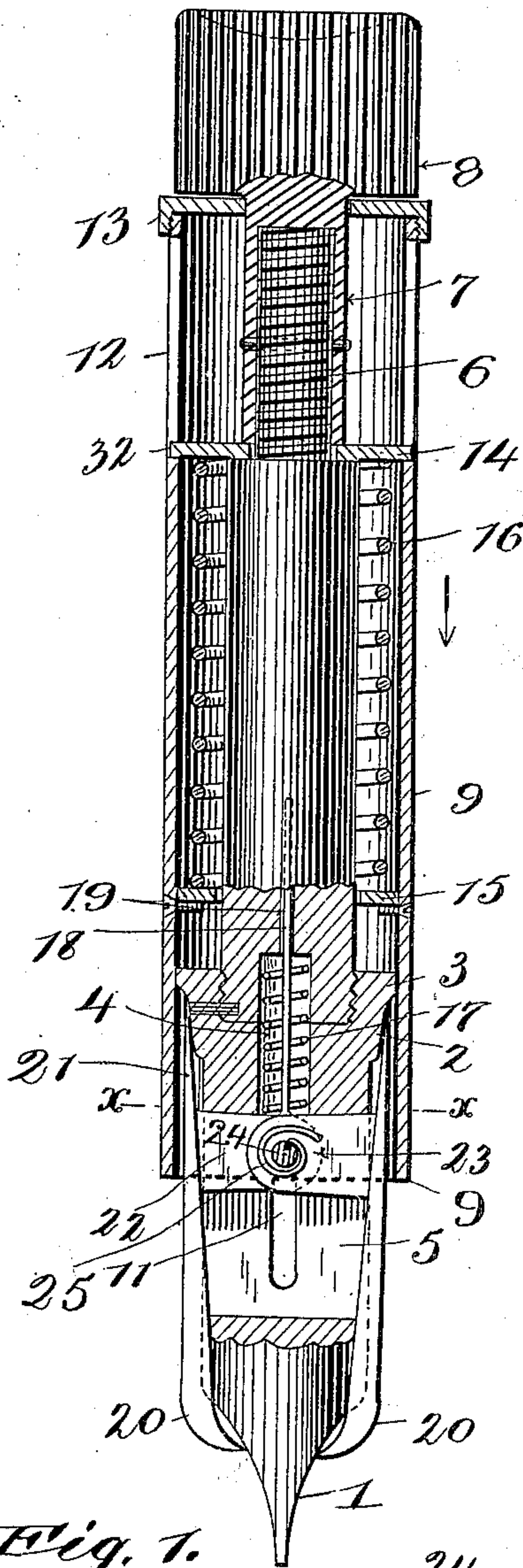


Fig. 1.

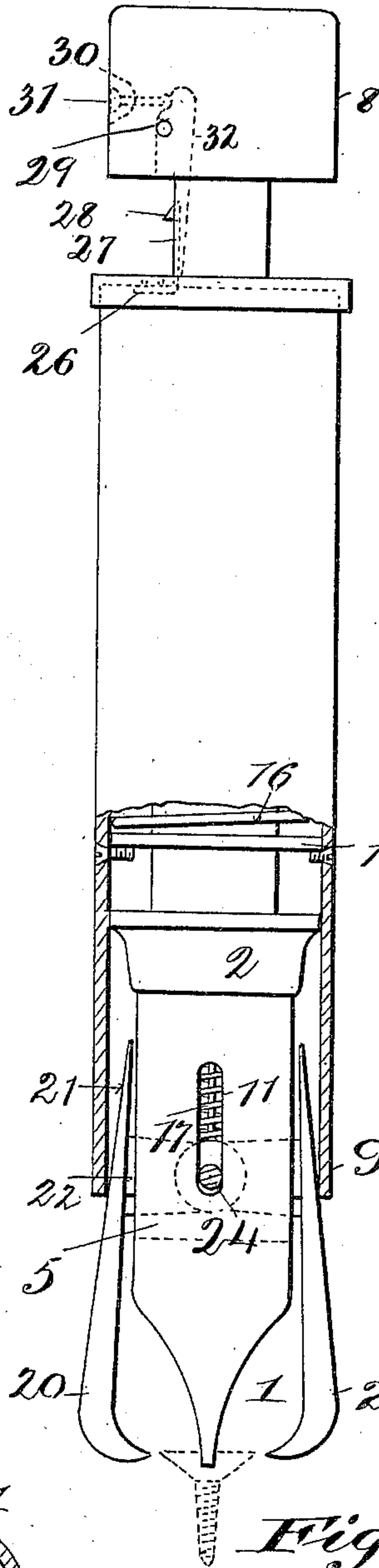


Fig. 3.

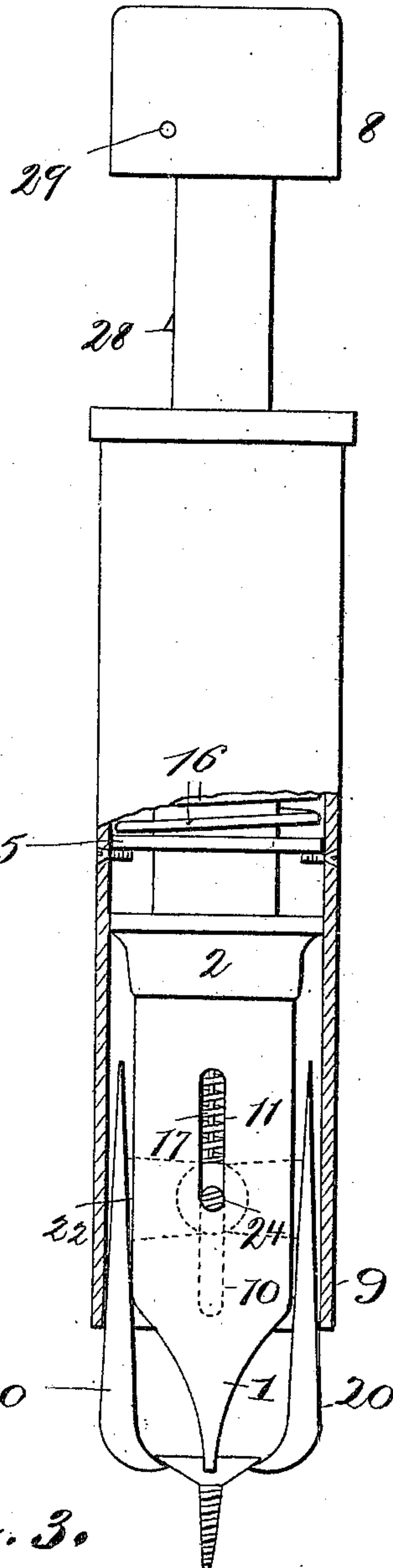
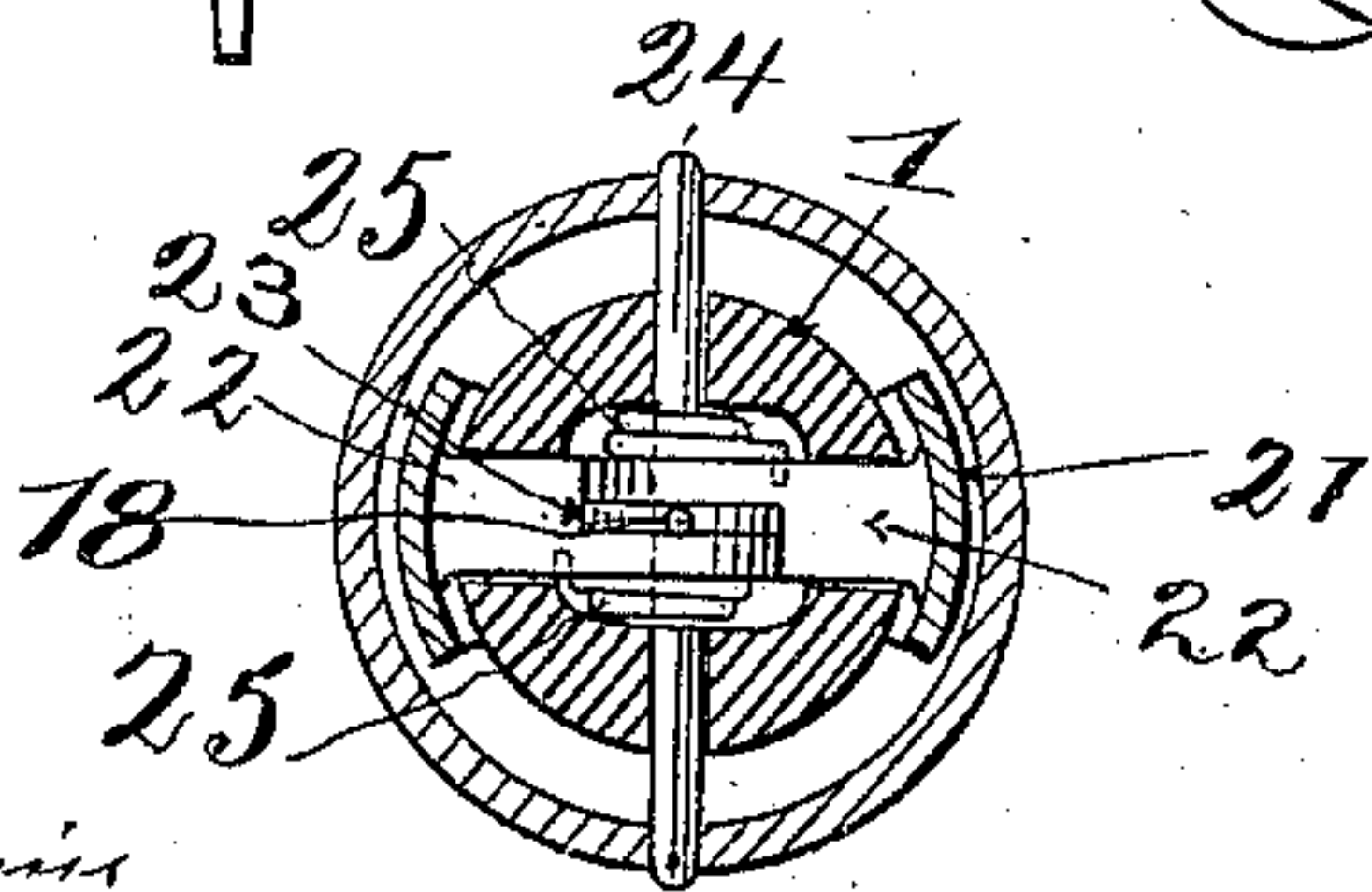


Fig. 4.



WITNESSES

W. Benjamin

Chas. G. Hensley Fig. 2.

INVENTOR

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UNITED STATES PATENT OFFICE.

PHILIP K. STERN, OF NEW YORK, N. Y.

SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 688,799, dated December 10, 1901.

Application filed November 19, 1900. Serial No. 37,085. (No model.)

To all whom it may concern:

Be it known that I, PHILIP K. STERN, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Screw-Drivers, of which the following is a specification.

My invention relates to screw-drivers having mechanical means carried by the tool for holding the screw in position for its insertion into the material in which it is desired that the screw shall be driven; and the objects of my invention are, first, to provide a ready means for gripping the screw, prior to its introduction into the material, in the manner of a pair of tweezers; second, to facilitate the release of the screw after it has been started, and, third, to eliminate the gripping jaws or tweezers from the driver-blade. I attain these objects by the mechanism shown in the drawings, in which—

Figure 1 is a vertical sectional view of my improved screw-driver cut away in a manner so as to best show the entire mechanism. Fig. 2 is a transverse section of the same, taken on the line X X of Fig. 1. Fig. 3 is an elevation, partly in section, exposing the jaws or tweezers and the position they occupy when about to grip the head of the screw. Fig. 4 is a like view to that of Fig. 3, with the exception, however, that the tweezers are shown in their position so as to grip the head of the screw preparatory to driving it in.

Similar numerals of reference designate similar parts throughout the several views.

In Fig. 1, I have shown the tweezers 20 eliminated from the blade 1, and when in this position, the tweezers are sufficiently clear of the blade 1 so that when applying the driver to a screw in the ordinary manner they will be free to rotate with the driver without striking or coming in contact with the surface or environs in which the screw is being driven.

The blade 1 and cone 2, serving as a cam and threaded end 6, taken together with the intermediate portion, to which they are attached and form part, constitute the shank of the screw-driver, and the jaws 20, jaw extensions 21, and their connecting parts, together with the hinge or pivot ears 22, coil-springs 25 for expanding the jaws 20, and hinge pin or pivot 24, constitute what I term

the "tweezers." The outer casing or tube 9, which is concentrically mounted slidably upon the shank and adapted to be moved down by the action of the spiral compression or thrust spring 16 in the direction indicated by the arrow, serves at its lower end the purpose of a cam for contracting the tweezer-jaws 20 reciprocally with said cam 2 on the driver-shank. The corrugated knob 8, having its threaded shank 7, which is screwed tight and pinned to the threaded end 6 of the screw-driver shank, forms the handle for rotating the driver. Jammed between the lower end of the handle-shank 7 and the shoulder of the driver-shank, from which the threaded portion 6 commences, and secured against rotation is a washer 14, having lugs 32. The washer is so constructed as to have a sliding fit within the tube 9, while the lugs 32 fit slidably in the groove 12. This arrangement permits of the spring 16 lifting the shank within the tube 9 to the upper limit of the slot 12 and at the same time prevents any rotation between the driver-shank and the tube 9. The tube 9 has another provision at its lower extremity for preventing rotation about the driver-shank, which is illustrated in Fig. 4. The manner by which I accomplish this feature is by milling a slot 10 (shown in the dotted lines in the lower extremity of the tube 9) and passing the pin 24 (also shown in Fig. 2) through the slot 10 and through the slot 11 in the driver-shank in a manner so as to engage both slots 10 and 11.

The pin 24, as well as forming an auxiliary carrier or dog for driving the driver-shank around when the screw-driver is turned by any portion of the tube 9, serves as the axis of the hinge of the tweezers 20. Supported within the tube 9, by the small screws shown in Fig. 1, is the thrust-washer 15, fitted so as to clear the driver-shank.

The eliminating jaw-setting cam-cone 2 has a bearing 3 fitted against the inner surface of the tube 9, so as to admit of an up-and-down movement of the driver-shank within the tube 15 with as little friction as possible.

In the position shown in Fig. 1 the spring 16 is under compression and the driver-shank and tube 9 are locked together by the small catch-hook or trigger 28, running up in the drilled recess 32, engaging the middle portion

of the cotter-pin 29 driven through the handle 8, as shown in Fig. 3.

In Fig. 1 the tweezers are shown set or closed in and locked upon the driver-shank, and hence in inoperative position. This was accomplished by forcing the tube 9 upward against the compression force of the spring 16 until the eliminating cam-cone 2 was brought to bear against the jaw extensions 21 of the tweezers to an extent sufficient to force the tweezers 20 to lie closely to the blade 1 of the driver-shank, while at the same time the ears 22 of the tweezers, being free to move in the slot 5 in the driver-shank, were lifted up by the pin 24 until they arrived at the terminus of the slot 10, when the tweezer-jaws were brought to a point somewhat above the edge of the blade 1, so as to practically eliminate them from the screw-driver, as clearly shown in Fig. 4. It will be observed that the slot 5 forms a guideway for the pivot-ears 22, while the slot 11 forms a guideway for the jaw-pivot 24, and for adapting said two slots to these purposes they are arranged to extend longitudinally of the driver-shank and in planes intersecting each other, as clearly shown. The engagement of the ears 22 and pivot 24 with their slots is of course effective throughout the movement of the jaws.

To effect the downward thrust of the tweezers so as to assume the position of that shown in Fig. 3 or Fig. 4 when the catch 28 has been released by the release-button 31, I employ a light compression or thrust spring 17, which is fitted and contained within the recess 4 around a jaw-guide rod 18, fitted in a bearing 19, which, together with the said recess, is formed centrally in the driver-shank and so as to extend upwardly therein. The guide-rod 18 is provided at its lower extremity with a washer 23 interposing the two bearing-surfaces of the pivot-ears 22 of the tweezer-jaws, as shown in Fig. 2. It will readily be understood by the arrangement as shown in the drawings that the thrust of the spring 17 against the end of the recess 4 will have the effect of carrying the tweezers downward until arrested by the pin 24 coming in contact with the bottom of slot 11 in the driver-shank, in which position the tweezers 20 will be lowered into the position of that shown in Fig. 3 or Fig. 4.

In Fig. 3, I have shown the tube 9 held up against the action of the compression-spring 16 just sufficient to enable the jaw-expanding springs 25 to open the tweezers 20 to their greatest extent, while in Fig. 4 the effect of releasing the tube 9, and allowing it to contract the tweezers 20 is clearly shown.

It is obvious that instead of the screw being held by the tweezers 20 brads, tacks, or the like could be held in position for driving them into whatever material might be deemed applicable. I am aware that many minor changes may be made in the construction of my improved screw-driver without departing

in the least from the spirit of my invention. I therefore do not desire to be limited in scope to the exact mechanical details of construction shown in the drawings or described herein, which is but a sufficiently clear and exact description of one manner of carrying out my invention, so that those versed in the art to which it pertains could construct and use the same; however,

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a screw-driver, the combination with the driver-shank, of pivoted jaws, forming tweezers, and devices adapted to set and lock said jaws in inoperative position relatively to and upon the said shank at a point above the edge of the blade; substantially as and for the purpose herein described.

2. In a screw-driver, the combination with the driver-shank, of pivoted jaws, forming tweezers, jointly movable longitudinally on said shank, jaw-expanding springs, a jaw thrust-spring, and devices for setting and locking the jaws upon the said shank against the action of their said expanding-springs and thrust-spring, the locked position of said jaws being above the edge of the blade; substantially as and for the purpose herein described.

3. In a screw-driver, the combination with the driver-shank, of pivoted jaws, forming tweezers, jointly movable longitudinally on said shank, jaw-expanding springs, a jaw thrust-spring, a jaw-setting cam on the driver-shank, a slidable shank-casing, also forming a jaw-setting cam, a casing thrust-spring and a casing-lock; substantially as and for the purpose herein described.

4. In a screw-driver, the combination of jaws, forming tweezers, having pivot-ears, a jaw-pivot, and a driver-shank having independent guideways for said ears and pivot, permitting the jaws to move longitudinally on said shank, said ears and pivot engaging with the guideways throughout said movement; substantially as and for the purpose herein described.

5. In a screw-driver, the combination of jaws, forming tweezers, having pivot-ears, a jaw-pivot and a driver-shank having longitudinal slots forming independent guideways for said ears and pivot, permitting the jaws to move longitudinally on said shank, said ears and pivot engaging with the slots throughout said movement; substantially as and for the purpose herein described.

6. In a screw-driver, the combination of jaws, forming tweezers, having pivot-ears, a jaw-pivot, a driver-shank having longitudinal guideways for said ears and pivot, a washer on the jaw-pivot between said pivot-ears, and a jaw-guide rod extending from said washer upward into the driver-shank; substantially as and for the purpose herein described.

7. In a screw-driver, the combination of a driver-shank having longitudinal slots intersecting each other, and a central recess ex-

tending upward from the slots, pivoted jaws, forming tweezers, having pivot-ears fitted in one of the said slots, a jaw-pivot fitted in the other of said slots, jaw-expanding springs on said pivot at opposite sides of the jaw pivot-ears, and a jaw thrust-spring fitted in said recess; substantially as and for the purpose herein described.

8. In a screw-driver, the combination of longitudinally-movable pivoted jaws, forming tweezers, a jaw thrust-spring, a driver-shank, and a slidable shank-casing having a longitudinal slot engaging the jaw-pivot, one end of said casing-slot forming a stop to counteract the jaw thrust-spring; substantially as and for the purpose herein described.

9. In a screw-driver, the combination of longitudinally-movable pivoted jaws, a jaw thrust-spring, a driver-shank, a slidable shank-casing having a longitudinal slot engaging the jaw-pivot, a casing thrust-spring, and a trigger on the driver-shank, forming a casing-lock; substantially as and for the purpose herein described.

10. In a driver-shank carrying tweezers, the combination of a thrust-spring for forcing the said tweezers toward one extremity of said driver-shank, a lifter carried by the driver-shank adapted to raise said tweezers against the action of said thrust-spring in a direction away from said extremity of said driver-shank, and of a cam carried by the driver-shank for contracting the tweezers; substantially as described.

11. In a driver-shank having tweezers, the combination of a carrier arranged about the driver-shank for lifting the said tweezers in a direction away from the operating end of the driver, a spring carried by the driver-shank for returning the tweezers after the same shall have been released by the said carrier and of a thrust-spring coacting between said driver-shank and said carrier for forcing said carrier down upon the tweezers so as to contract the same; substantially as described.

12. In a driver-shank, the combination of tweezers adapted to coact with the driving end of said driver-shank of the casing 9, slidably mounted upon the said driver-shank and means provided upon said driver-shank within said casing, whereby upon a movement being given to said casing in one direction, said tweezers shall be brought into operative position, so as to coact with said driving end of said driver-shank, and whereupon an opposite movement being given to said casing, said tweezers shall be drawn out of an operative position on said driver-shank and whereupon said tweezers shall have been eliminated from said driving end of said driver-shank; substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PHILIP K. STERN.

Witnesses:

ABRAHAM J. SPIRE,
CHAS. WAHLERR.