

(No Model.)

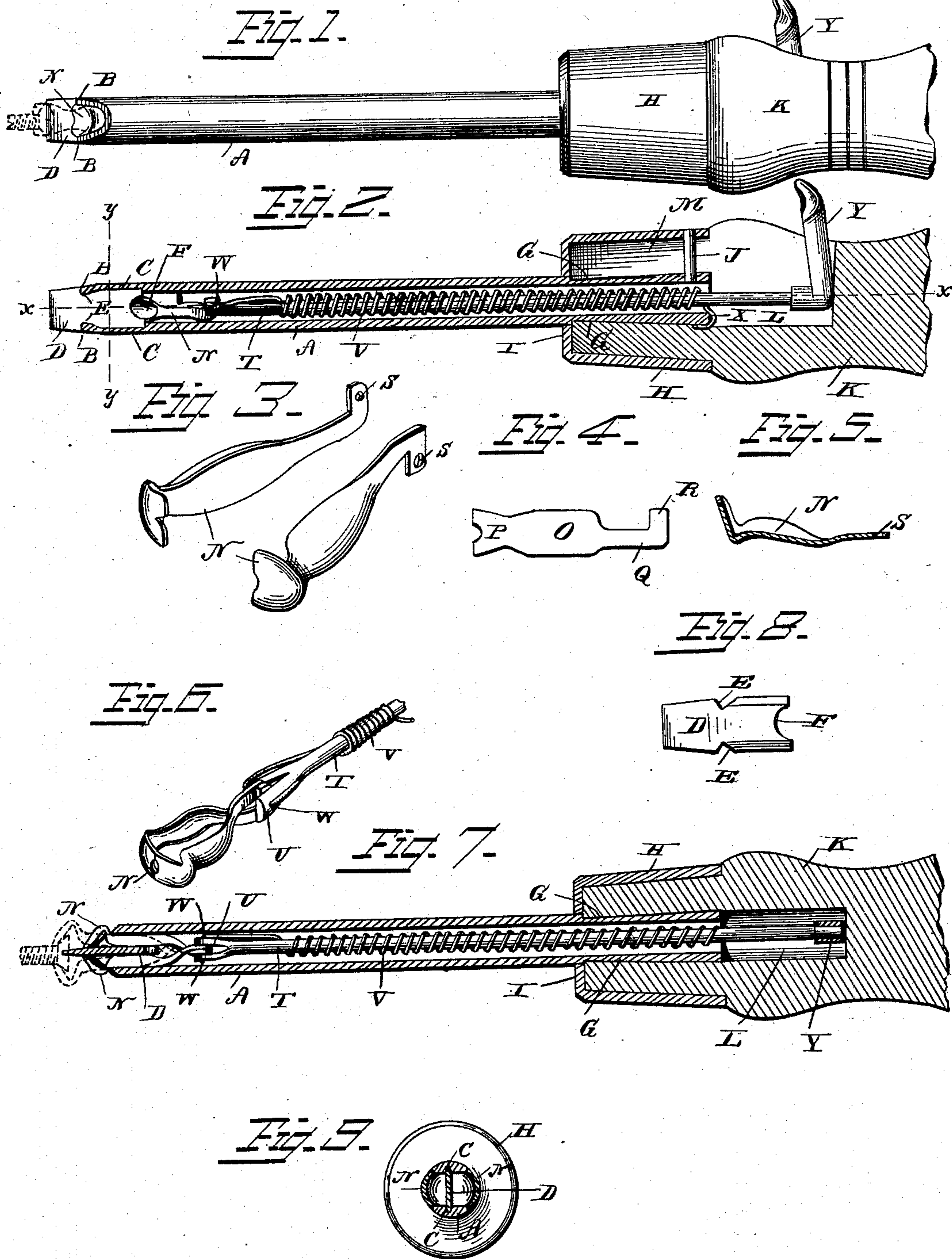
2 Sheets—Sheet 1.

M. B. CRAWFORD.

SCREW DRIVER.

No. 274,912.

Patented Apr. 3, 1883.



WITNESSES
H. L. Curran
J. R. Little

INVENTOR
M. B. Crawford,
by C. A. Snow & Co. Attorneys.

(No Model.)

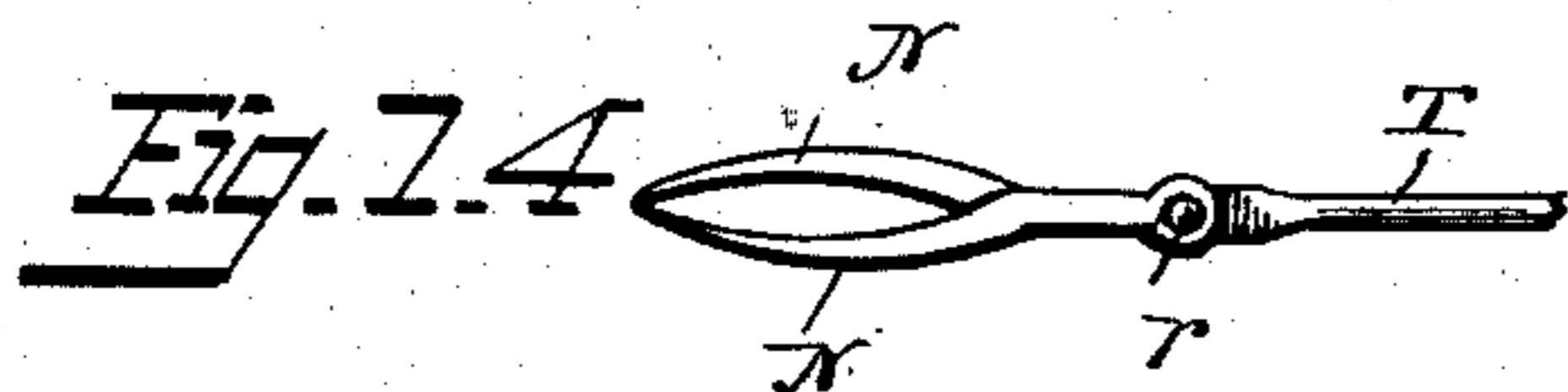
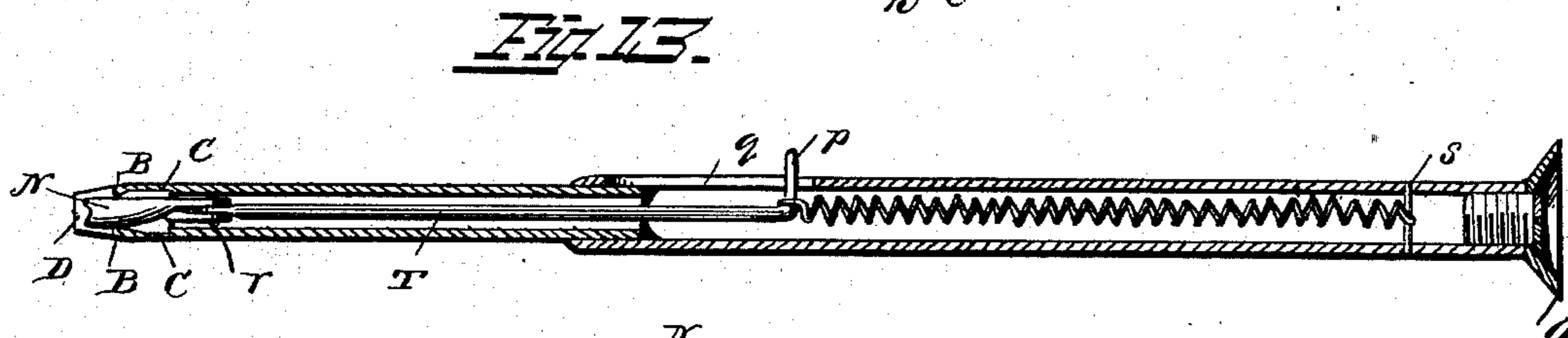
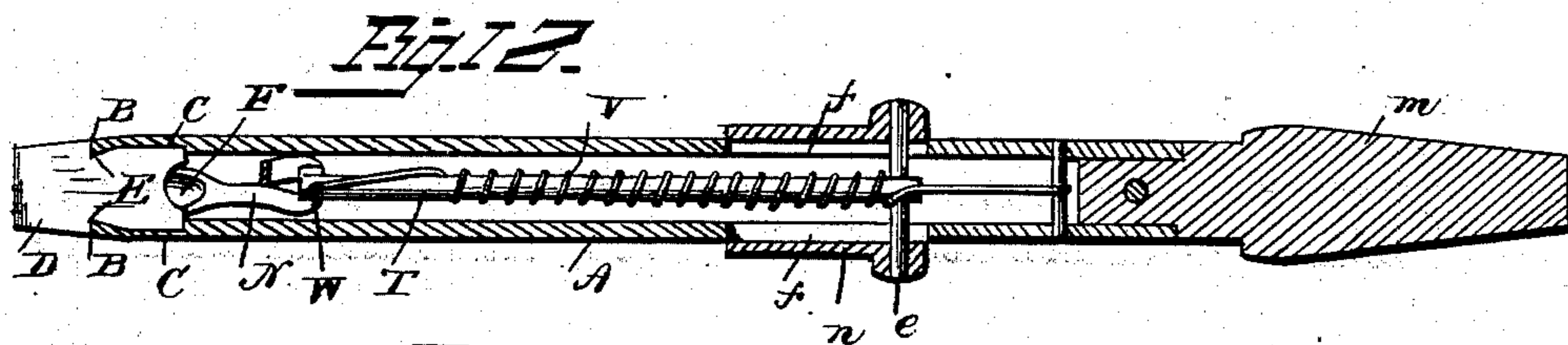
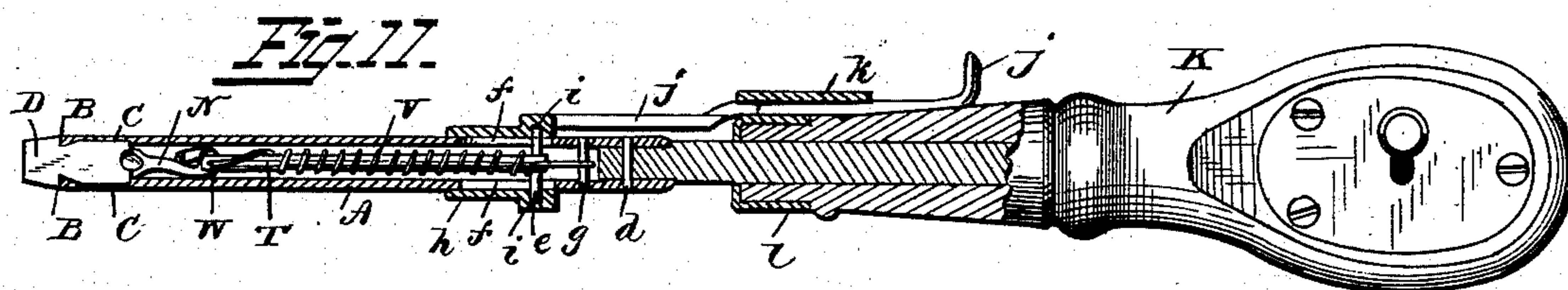
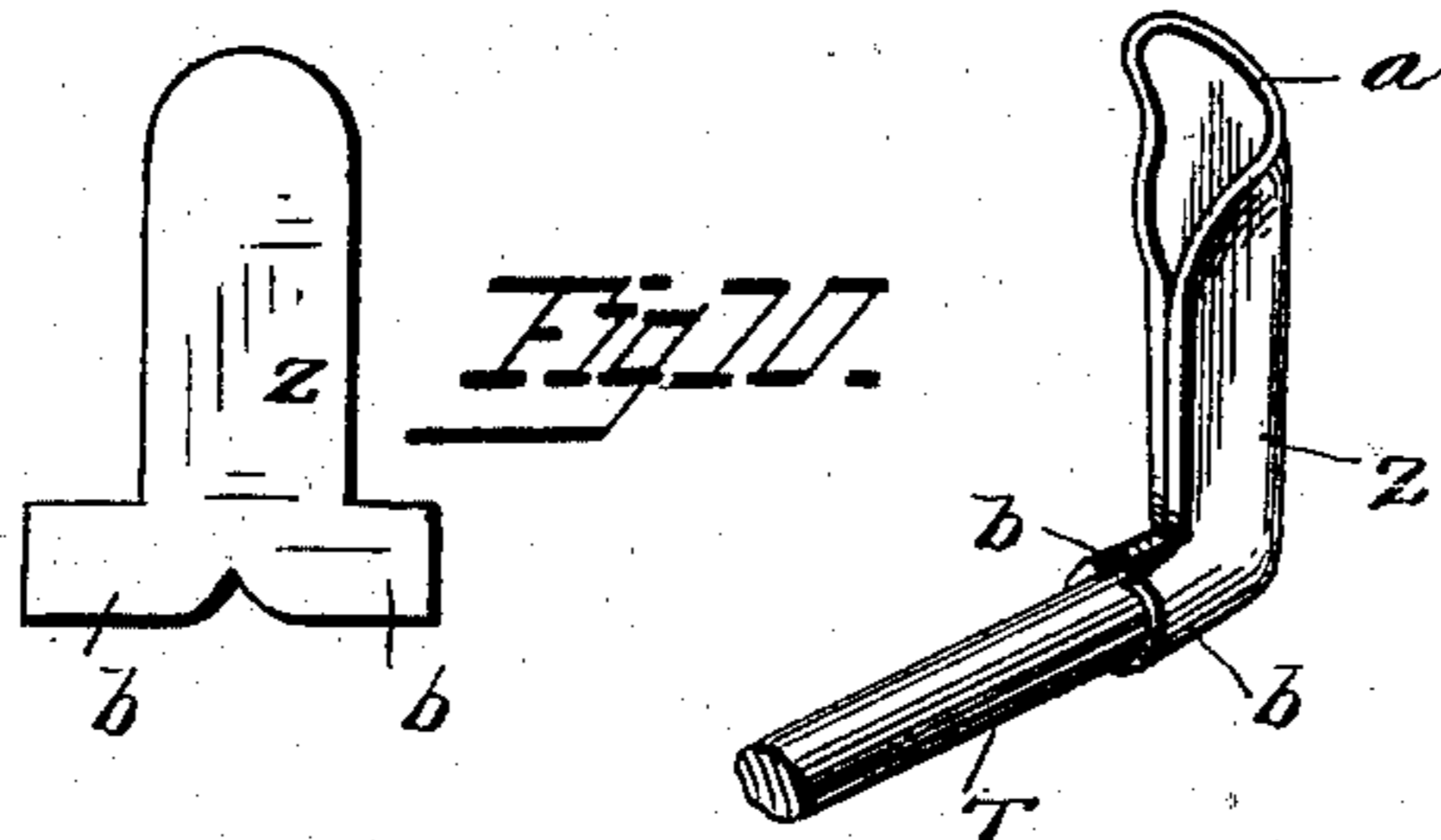
2 Sheets—Sheet 2.

M. B. CRAWFORD.

SCREW DRIVER.

No. 274,912.

Patented Apr. 3, 1883.



WITNESSES
F. L. Ouraud.
J. R. Litzell,

INVENTOR
M. B. Crawford,
by C. A. Snow & Co. Attorneys.

UNITED STATES PATENT OFFICE.

MARTIN B. CRAWFORD, OF TERRE HAUTE, INDIANA.

SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 274,912, dated April 3, 1883.

Application filed December 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, MARTIN B. CRAWFORD, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented a new and useful Screw-Driver, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to screw-drivers; and it consists in certain improvements in the construction of the same, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a side view of one form of my improved screw-driver. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a perspective view of the clamping-jaws detached. Figs. 4 and 5 are detail views, illustrating steps in the manufacture of said clamping-jaws. Fig. 6 is a perspective view, illustrating the method of connecting the clamping-jaws to the slide-rod by means of the spring. Fig. 7 is a longitudinal sectional view on the line *xx* in Fig. 2. Fig. 8 is a plan view of the bit of the screw-driver detached. Fig. 9 is a section on the line *yy* in Fig. 2. Fig. 10 is a detail view, illustrating the construction of the operating-handle and the method of connecting the same to the slide-rod. Fig. 11 is a longitudinal sectional view, illustrating a modification of my invention, whereby it is applied to a ratchet screw-driver. Fig. 12 is a similar view, showing my invention applied to a screw-driver adapted to be used in a brace or stock. Fig. 13 is a longitudinal sectional view, showing my invention applied to a watch-maker's screw-driver; and Fig. 14 is a detail view of the latter.

The same letters refer to the same parts in all the figures.

This invention has special reference to that class of screw-drivers which are equipped with clamping-jaws or similar means for holding the head of a screw securely in contact with the bit of the screw-driver while being operated upon; and it has for its object to produce an article which shall be simple, durable, convenient, inexpensive, and easily manipulated.

To this end it is constructed substantially as will be hereinafter more fully shown and specified.

My improved screw-driver in all its forms embodies a tubular shank or barrel, carrying at one end a driving-bit, a sliding rod carrying the clamping-jaws, a spring which forces the said sliding rod downwardly into the barrel, and an operating-handle.

In the drawings, A represents the tubular shank or barrel, which may be an ordinary piece of metal pipe of suitable dimensions. The upper end of this is cut off in Λ shape, as shown, and provided with interior longitudinal grooves, extending from the points B B for a short distance in an inward direction. Said grooves, which are denoted by C C, are for the reception of the bit D. The latter, as shown in Fig. 8 of the drawings, consists of a small flat plate, the upper end of which is shaped like the point or bit of an ordinary screw-driver. The sides of said plate are provided with notches E E, and its lower end has a curved recess, F. To attach the bit D to the stock or barrel A, I simply insert its lower end into the groove C until the notches E E register with the points B B, which are then simply bent or forced into said notches, thereby serving to hold the bit firmly and securely in position without danger of its turning and coming loose while the device is being used. The lower end of the shank or barrel A has an annular recess, G, tapering in an upward direction, as shown.

H is a ferrule or cap, having a flange, I, by which it is fitted upon the stock or barrel, just above the recess G. The cap or ferrule H, which is tapering, as shown, is connected to the stock or barrel, near its upper end, by a rivet, J, which may be readily clinched while the stock is being held upon a mandrel.

K represents the handle of the screw-driver, which may be made, in the ordinary manner, of wood, having a socket or recess, L, and provided with a longitudinal slot or notch, M, the object of which is to receive and accommodate the rivet J when the stock or barrel and the cap or ferrule are driven into place upon the handle. When this takes place the tapering ferrule compresses the end of the wooden handle around the end of the stock, forcing it into the recess G of the same, thereby clamping and holding the stock or barrel securely in position.

N N are the clamping-jaws of the device.

These, which are in practice to be stamped from heavy sheet metal, are first given the shape shown in Fig. 4 of the drawings, by reference to which it will be seen that they consist of an oblong body, O, having an approximately U-shaped head, P, and a shank, Q, provided with a laterally-projecting lug, R. The lugs R of each pair of clamping-jaws project in opposite directions, as will be seen by reference to Fig. 3 of the drawings. In the next or second step of their manufacture the blanks shown in Fig. 4 are subjected to the action of suitable dies, by which the body is curved or bent longitudinally and the head bent at an angle to the body, as shown in Fig. 5 of the drawings, thereby adapting the jaws to fit in the ends of the barrel at the sides of the bit, against which the heads of the jaws are adapted to rest, as shown in Fig. 1, in which the jaws are shown to be withdrawn. Hinge holes or perforations S are then formed in the lugs R, and the jaws are finally finished off in any suitable manner. By constructing the clamping-jaws, in the manner described, from sheet metal, I am enabled to make them very light and yet so strong and durable that they will readily resist any strain to which they are likely to be subjected.

T is a rod fitted to slide longitudinally in the barrel A, and having its upper end bifurcated, as shown at U, to receive the ends of the clamping-jaws, which are hinged to the said rod as follows:

V represents a spring coiled around the rod T, within the barrel A. The outer end of this spring-coil is bent so as to form an arm, which extends horizontally through openings W W in the bifurcated end of the rod T and through the hinge-holes S of the jaws N, which are adjusted in the bifurcated end of the slide-rod, to which the jaws are thus hinged, while at the same time the spring is connected to the upper end of the rod. The inner end of the spring is bent so as to form a hook, X, which is adjusted over the inner end of the barrel A, thus causing the tension of the spring to draw the rod T downwardly into the barrel, causing the heads of the clamping-jaws to rest against the sides of the bit. The heads of the clamping-jaws, being bent outwardly from the shank or body, serve to prevent the rod and jaws from sliding too far down into the barrel.

The slide-rod T is provided at its inner end with a handle, Y. (Shown clearly in Fig. 10 of the drawings.) Said handle, which I prefer to make by stamping it from heavy sheet metal, consists essentially of a stem or shank, Z, provided at one end with a knob or head, a, and at the other end with two laterally-projecting lugs or flanges, b b, which latter are, in the process of applying the handle to the rod T, turned up and clamped or clinched around said rod, thereby bracing and holding the handle securely. In order to secure the necessary adhesion, solder is also employed to secure the handle Y to the rod T. The head a and shank Z of the handle Y are in the process of manu-

facture bent or corrugated as shown, thus making the handle light, strong, and durable, all of which are necessary requisites in a device of this kind. I wish, however, to reserve to myself the privilege of constructing the handle in a different manner from the one here described. Thus, for instance, I may find it expedient to form it by simply bending the inner end of the rod T at an angle to the body of the same, which method, especially in small-sized tools, may be deemed preferable.

The method of putting the parts of my improved screw-driver together for operation will be readily understood when reference is had to Figs. 2 and 7 of the drawings. The slide-rod, with the clamping jaws and springs, are first put into place and the inner end of the spring hooked over the inner end of the barrel, to which the cap or ferrule has been previously attached, as herein described. The bit D is then put into place and secured, the handle attached to the inner end of the slide-rod, and the barrel, with its attachments, is then ready to be driven into place upon the handle. When this has been done the tool is complete and ready for operation.

To use my improved screw-driver it is held in the hand in the usual manner. By pushing the handle, which slides in the slot M, in an outward direction against the tension of the spring, the clamping-jaws are then carried out beyond the end of the bit and enabled to grasp the head of a screw and hold it securely in contact with the bit, which fits in the usual manner in the notch in the screw-head. Only one hand is necessary for manipulating the tool, which may be used for picking up as well as for holding the screw. It will be observed that the bit which separates the clamping-jaws serves to spread said jaws apart when forced outward, thus doing away with the necessity of providing separate guide-slots for the said jaws. The latter, which have been described as having approximately U-shaped heads, will take nicely around the head and shank of the screw, which is thus held firmly. If desired, however, the heads of the jaws may be provided with sharp or V-shaped notches, which will perhaps cause them to adapt themselves more readily to screws of different sizes, which will all be held with equal facility.

The bit, it will be observed, is provided at its inner end with a curved recess or notch, F. This is for the purpose of preventing the inner end of said bit from interfering with the free action of the clamping-jaws, and yet make the inner end of the bit of sufficient length to take well in and be held securely by the grooves C and points B B of the stock or barrel. When necessary, if, for instance, the bit should become accidentally injured or broken, it may, without much difficulty, be pulled out or extracted and a new one fitted in its place, and this may be done by an unskilled person without the aid of any but the most ordinary tools.

The foregoing description, as will be seen, applies to the most ordinary form of a screw-

driver embodying my invention. When the tools are to be used for special purposes slight modifications are necessary, some of which I shall now proceed to describe.

5 In Fig. 11 of the drawings my invention is shown applied to a ratchet screw-driver. In this the ratchet mechanism, which is of the ordinary construction, is contained in the handle of the tool, and is not herein shown in detail nor claimed. The stem or body of the tool which engages the pawl-and-ratchet mechanism projects at the end of the handle, as shown at *c*, and to it the tubular shank or barrel *A* of the tool is secured, preferably by means of a rivet, *d*, passing transversely through both. The slide-rod *T* is in this instance made somewhat shorter than before and deprived of its handle *Y*, in lieu of which it is provided with a transverse pin or cross-piece, *e*, extending a short distance through two slots, *f f*, formed longitudinally in the sides of the barrel *A*. The spring *V*, which is coiled, as before described, around the rod *T*, has its upper end employed to form a hinge-rod for the clamping-jaws, in the manner already described. The inner end of the said spring has a hook, which is adjusted over a pin or rivet, *g*, secured transversely in barrel *A*, thus providing the necessary tension.

30 *h* is a sleeve fitted to slide longitudinally upon the barrel *A*, and having an interior annular groove, *i*, which receives the projecting ends of the pin or cross-piece *e*. The sliding sleeve *h* is provided with a handle, *j*, consisting of a suitable rod, sliding in an ear or guide, *k*, formed upon the ferrule *l* of the tool.

It will be observed that the clamping mechanism may be readily operated by sliding the sleeve *h* upwardly upon the handle; also, that the sleeve *h* will readily permit the barrel of the tool to turn in relation to the handle during operation, owing to the annular groove *i*, which receives the ends of the pin *e*.

Fig. 12 of the drawings illustrates the application of my invention to a screw-driver adapted to be used in a brace or stock. In this case the barrel *A* is fitted upon or provided with a butt, *m*, adapted to fit in a brace-head. The slide-rod *T*, as in the ratchet screw-driver, is without a handle, except a cross-pin, *e*, extending through slots *f f* in the sides of the barrel, and also through a longitudinally-sliding sleeve, *n*, to which the cross-pin is in this case firmly secured or riveted. The operation of this modification is obvious.

A small and delicate tool, convenient for the use of watch-makers and for like purposes, is illustrated in Figs. 13 and 14 of the drawings. This tool has a tubular barrel or body, provided at its butt-end with a swiveled finger-piece, *o*. The slide-rod *T* is bent at its inner end, so as to form a handle, *p*, which extends through a slot, *q*, in the side of the barrel. The clamping-jaws are in this case hinged to the end of the slide-rod *T* by a separate pin or rivet, *r*. The coiled spring *V* has its upper and lower ends attached respectively to the

handle *p* and to a cross-pin, *s*, suitably secured transversely in the barrel. By this construction I am enabled to make an exceedingly small and delicate tool, which is particularly useful for the purposes stated.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood. It is simple in construction, strong, light, and durable; and it may be manufactured at a cost which is low when its advantages are taken into consideration.

I claim as my invention, and desire to secure by Letters Patent of the United States—

1. In a screw-driver, the combination, with a tubular stock or barrel provided at its end with interior longitudinal grooves, of a suitable bit-plate seated in said grooves, as set forth.

2. In a screw-driver, the combination, with a tubular stock or barrel provided at its end with Λ -shaped points and interior longitudinal grooves, of a bit-plate seated in said grooves and provided with notches in its sides to receive the said points, as set forth.

3. The combination, with the tubular stock or barrel provided at its inner end with an annular tapering recess, of the socketed wooden handle and a tapering clamping cap or ferrule, as and for the purpose set forth.

4. The tubular stock or barrel provided at its inner end with an annular tapering recess, and having a tapering cap or ferrule secured thereto by a transverse pin or rivet, in combination with the socketed wooden handle having a transverse longitudinal slot, as and for the purpose set forth.

5. The combination of the tubular stock or barrel, the bit-plate seated in the end of the same and having a curved notch or recess in its inner end, and the longitudinally-sliding rod having a pair of hinged clamping-jaws bearing against the inner notched end of the bit-plate, as set forth.

6. In a screw-driver of the class described, the herein-described clamping-jaws, stamped or constructed of sheet metal, and consisting essentially of a longitudinally curved or corrugated body and shank, an approximately U-shaped notched head bent, substantially as shown, at an angle to the body, and a lug projecting laterally from the shank or stem and having a perforation or hinge-hole, as set forth.

7. The combination of the tubular barrel, the bit seated in the end of the same, the slide-rod bifurcated and perforated at its outer end, the clamping-jaws having stems provided on opposite sides with laterally-projecting perforated lugs, and means for hinging said clamping-jaws to the said slide-rod, as set forth.

8. The combination of the slide-rod, bifurcated and perforated at its outer end, the clamping-jaws having perforated hinge-lugs fitted in the bifurcated end of the slide-rod, and a spring coiled around said slide-rod and having its outer end bent so as to form an arm

extending through the perforations in the slide-rod, and clamping-jaws whereby the latter are hinged to the former and the upper end of the spring connected to the outer end of the slide-rod, as set forth.

9. The combination of the tubular stock or barrel, the bit seated in the same, the longitudinally-sliding rod carrying a pair of hinged clamping-jaws, and a spring coiled around and having its upper end connected to said slide-rod, and having its inner end hooked over the lower end of the tubular barrel, as set forth.

10. The combination of the tubular stock or barrel, the bit seated in the same, the longitudinally-sliding rod carrying a pair of hinged clamping-jaws, a spring coiled around and forcing the said slide-rod in an inward direction in the tubular stock, and a suitable handle permanently attached to said slide-rod, whereby the latter may be forced outwardly against the tension of the spring, as set forth.

11. In a screw-driver of the class described, the combination, with the slide-rod carrying the clamping-jaws, of the herein-described thumb-piece or handle stamped or struck up from sheet metal, and provided with laterally-projecting upturned lugs or flanges clamped or clinched around the inner end of said slide-rod, and thereby bracing the said thumb-piece in position at an angle to the said slide-rod, as set forth.

12. In a screw-driver, the combination of the tubular stock or barrel, the bit seated in the end of the same, the longitudinally-sliding rod carrying the clamping-jaws and provided at its inner end with a rigidly-attached handle at an angle to the body of the same, a spring forcing the said rod inwardly into the barrel, and a handle having a longitudinal slot to receive and admit of a longitudinally-sliding movement of the thumb-piece or handle of the slide-rod, as set forth.

13. The combination of the tubular stock or barrel, having a tapering annular recess at its lower end and provided with a tapering clamping cap or ferrule, the bit seated in the end of said barrel, the socketed and longitudinally-slotted handle, the slide-rod carrying the clamping-jaws, and the spring coiled around and attached at its outer end to the said slide-rod, and having its inner end hooked over the lower end of the barrel, whereby when the said barrel is driven into place in the socketed handle the hooked end of the spring is clamped and held between the said handle and barrel, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

MARTIN B. CRAWFORD.

Witnesses:

A. H. KILDOW,
CHARLES E. TEMPLE.