

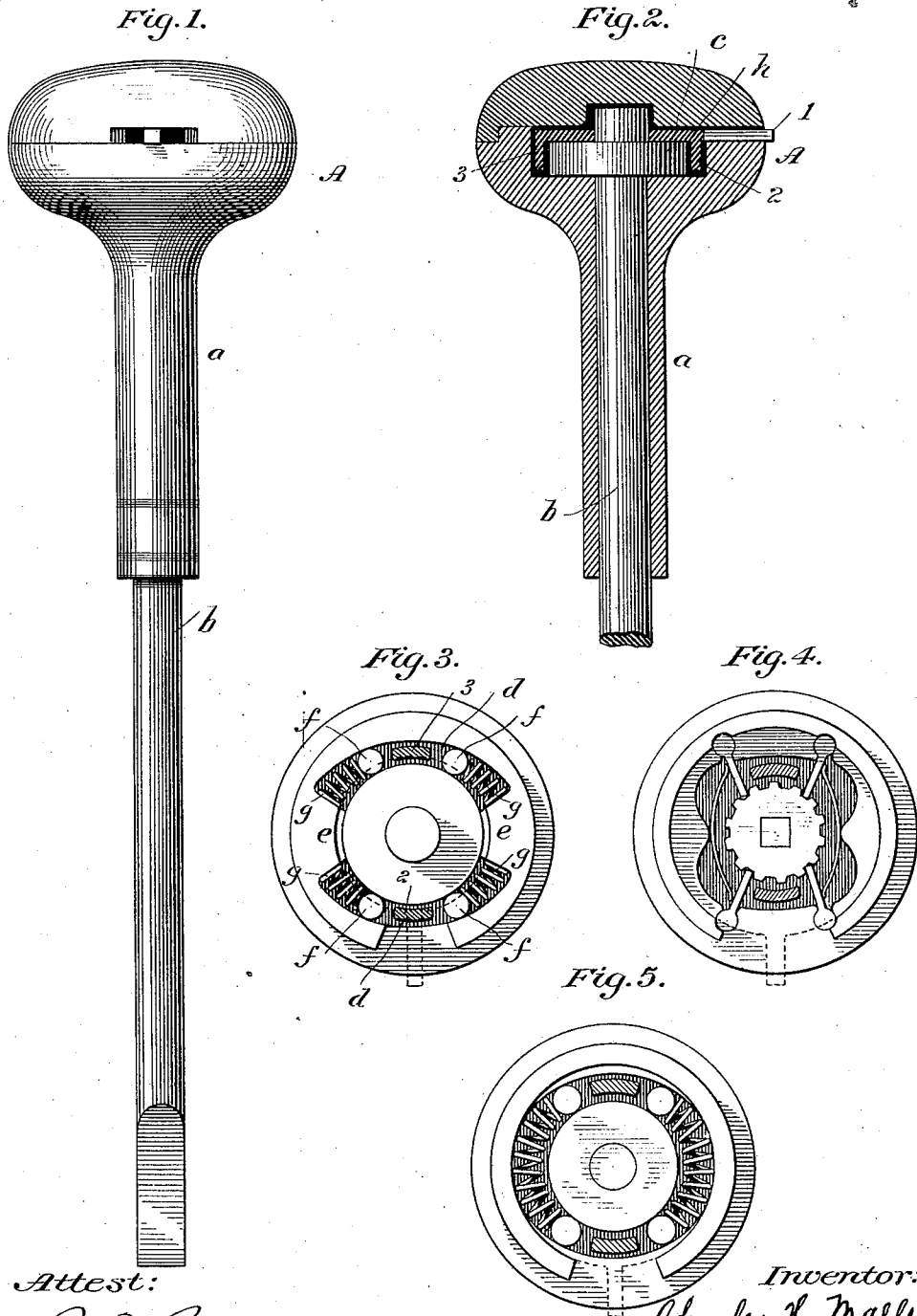
(No Model.)

C. H. MALLETT & Z. T. FURBISH.

SCREW DRIVER.

No. 247,669.

Patented Sept. 27, 1881.



Attest:

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CHARLES H. MALLETT AND ZACHARY T. FURBISH, OF AUGUSTA, MAINE.

SCREW-DRIVER.

SPECIFICATION forming part of Letters Patent No. 247,669, dated September 27, 1881.

Application filed August 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. MALLETT and ZACHARY T. FURBISH, of Augusta, in the county of Kennebec and State of Maine, have invented a new and useful Improvement in Screw-Drivers; and I do hereby declare that the following is a full, clear, and exact description of the same.

Our invention relates to screw-drivers of that class in which the shank of the driver is held in the head by pawl or equivalent connections, whereby the said shank may be turned intermittently by the hand without loosening the grasp upon the head of the tool.

The invention consists in the special construction of the connections between the shank and head, which construction affords a double, and therefore more secure, lock between the tool and handle and greater simplicity in the parts, thereby lessening the cost and increasing the durability of the implement.

In the accompanying drawings, Figure 1 shows a side elevation of my improved tool; Fig. 2, a central longitudinal section; and Fig. 3, a plan view of the connecting devices in the head, the cap being removed to show them. Figs. 4 and 5 represent modifications of the locking arrangement, shown in plan with the cap removed.

In the drawings the head is indicated at A. It is provided with a hollow shank, *a*, fitted to receive the solid shank of the tool *b*, which turns therein freely, but with a snug fit. The upper end of shank of tool *b* is fixed in a disk, *c*, which lies in a recess in the head, being centrally arranged therein and capable of turning freely when not checked by the special devices provided for that purpose. The recess in which this disk is placed is enlarged on opposite sides, as shown at *d d*, Fig. 3. These enlargements lie between shoulders *e e* and are of the same depth as the recess itself.

The walls of the enlargements, opposite the periphery of the disk, are formed on a curve larger than that of the disk, and flattened at the central part, so that when the disk is in place there is a recess or channel between said disk and the vertical curved wall of the enlargement, which channel is widest at the ends and gradually narrows toward the center. In these channels I place rollers *f f*, two on each side, arranged vertically, and of a

diameter to pinch upon the periphery of the disk when forced from the ends toward the center of the channel. Small springs *g*, preferably of coiled wire, are placed behind these rollers, said springs bearing against the shoulders *e e*, and when not compressed by means hereinafter described they push the rollers into the narrower part of the channel, where they are pinched between the periphery of the disk and the wall of the enlargement. As there is a pair of these rollers and springs on each side, it is evident that when both of either or all of them are in action the disk will be held stationary and cannot turn in either direction. Attempt to turn one way will throw one roller on each side more closely into the narrower part of the channels, and cause them to thereby pinch more strongly against the periphery of the disk; and in order to permit the disk to turn in either direction those rollers must be thrown out of contact which would be made to pinch by turning in that direction. This is accomplished by means of the cap-disk *h*, which has a central hole and fits over the projecting upper end of the shank of tool *b* and lies upon the disk *c*.

An arm, *1*, projects from the disk *h* and passes through a slot in the head, formed by cutting away the wall midway of the channel, on one side. This arm extends outside far enough for convenient manipulation by the hand. Just underneath this arm is a downwardly-projecting lug, *2*, and a similar lug, *3*, exactly opposite, both passing between the pairs of rollers on each side. These parts are so adjusted that by turning the arm in one direction toward the end of its slot the lugs will throw back one of the rollers on each side and permit the head on the disk and shank to turn freely in the opposite direction. Obviously a reverse movement of the arm will force back the opposite set of rollers in the opposite direction and permit the rotation of the head or disk in reverse direction. It is clear, also, that motion of the head, under the circumstances described, is permitted only one way. When the arm is pressed to the left the head may be freely turned in that direction, but will cause the rollers to pinch upon the disk when turned in opposite direction. Repeated movement, such as this just described, will enable the operator to give the repeated partial turns to

the tool required in forcing home an ordinary screw, and the reverse movement is obtained by turning the arm in the opposite direction.

5 The disk *h* serves the purpose of carrying the lugs 2 as a lever to give them proper motion, and as a plate to cover the working parts and keep them in place. This greatly simplifies the construction and at the same time affords great security.

10 The double system of locking devices manifestly increases the strength of the connections between the head and tool. The construction shown in Figs. 1, 2, and 3 has also this advantage, that the locking devices, consisting of 15 small rollers, occupy small space, and the disk on the shank of the tool may be made larger, giving the locking devices greater leverage and therefore smaller strain. The use of our improved cap-plate is not, however, confined 20 to this special construction of the locking devices. The form shown in Fig. 4 includes four pawls in the place of the binding-rollers, with nearly the same effect. There are two holding-pawls always in contact instead of one, as 25 heretofore, and the lugs are between the pawls of the pairs in the same manner as with the rollers. This is a very simple construction, and an improvement on the pawl mechanisms heretofore shown, since the pawls may be set in 30 vertical grooves in the round head and each pair be held by the same spring. There are only seven parts in all, and only three forms, the four pawls being all alike and the springs duplicates.

35 It is not essential that the shoulders should be used for the springs. Instead, the shoulders being removed, the springs may extend from roller to roller, as shown in Fig. 5, when the action of spring, rolls, and cap-plate are 40 the same.

The devices shown and described as our invention are applicable to flat handles of screw-drivers by easy modification.

45 It will, of course, be readily understood that the shank connected directly to the disk on which the stop or pawl mechanism operates may be divided and have a socket for differ-

ent forms of tools, as shown in Figs. 4 and 5, when the said shank terminates in an enlargement, *D*, having a socket adapted to receive a 50 bit or screw-driver or any such tool.

Instead of the ball-shaped head shown in the figures, there may be a disk or shell adapted to hold the described mechanism and an ordinary bit-crank attached thereto. It is also 55 plain that instead of four rollers only one pair may be used with one pair of springs; but the duplicate pairs are better.

Having thus described our invention, what we claim is—

60 1. The combination, in a screw-driver, of a disk attached to the central spindle, the chambered head, binding-rollers working in recesses in the said disk, springs operating to press said binding-rollers into contact, and means, 65 substantially as described, for relieving the pressure of the springs, substantially as described.

2. The combination of the chambered head, the central shank working therein, and re- 70 cessed disk fixed to said shank and located within the head, stops acting in opposite directions to hold the disk in the head against rotation, and a cap-plate having lugs adapted to push back said stops in either direction, 75 substantially as described.

3. The combination of the chambered head and central shank, a recessed disk and stops, and their springs acting in opposite directions 80 to hold the disk to the head, and the cap-plate having lugs adapted to separate or push back said stops in either direction, and also adapted, when in central position, to leave both in contact, whereby the disk may be rotated in either 85 direction or may be held firmly connected to the head, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHAS. H. MALLETT.
Z. T. FURBISH.

Witnesses:

GEO. W. MARTIN,
JOSEPH E. BADGER.