

No. 870,014.

PATENTED NOV. 5, 1907.

S. A. CAMPBELL.
TOOL.

APPLICATION FILED MAR. 11, 1907.

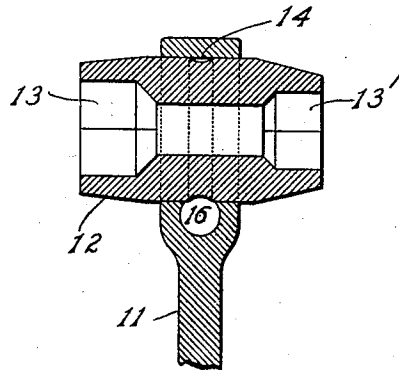
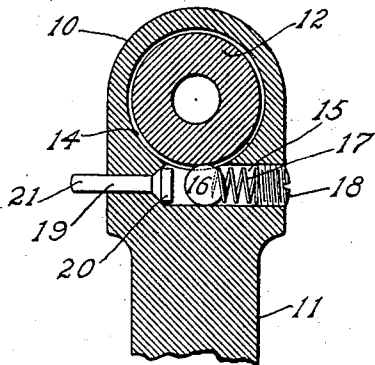
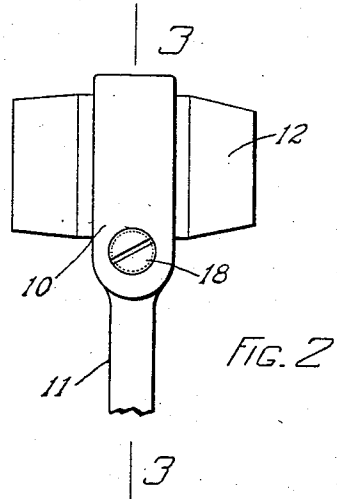
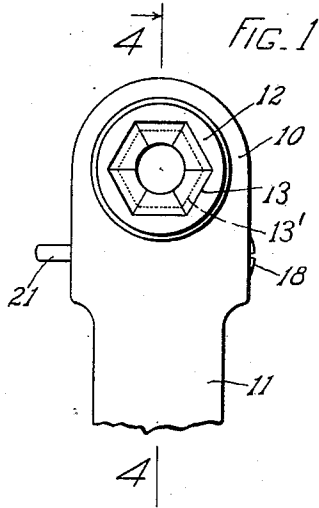


FIG. 3

FIG. 4

WITNESSES

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SOLOMON A. CAMPBELL, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO EDWARD T. KIMBALL, OF BOSTON, MASSACHUSETTS.

TOOL.

No. 870,014.

Specification of Letters Patent.

Patented Nov. 5, 1907.

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To all whom it may concern:

Be it known that I, SOLOMON A. CAMPBELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Tools, of which the following is a specification.

This invention relates to improvements in tools. In particular, it relates to tools intended to transform an alternating forward and backward action into a rotatory action in continuous direction. In this specification it is represented as applied to a wrench, but it is applicable to other tools.

In the accompanying drawings Figure 1 represents the head of a wrench embodying the invention, in side elevation. Fig. 2 represents the same in edge elevation. Fig. 3 is a view corresponding to Fig. 1, sectioned on the plane 3—3 of Fig. 2. Fig. 4 is a view corresponding to Fig. 2, sectioned on the plane 4—4 of Fig. 1.

Referring to the drawings: 10 represents the head of a tool, represented as a wrench, having a handle or stock portion 11 and a barrel 12 rotatable within the head. The barrel contains sockets 13, 13 at its opposite ends, which are here represented as of hexagonal shape and of different sizes. An annular groove 14 is formed in the periphery of the barrel. A hole 15 pierces the stock of the wrench in the same plane with the groove and communicates therewith, as clearly shown in Fig. 3. This hole is preferably of circular bore, into which a ball 16 fits loosely, projecting also into said groove. The groove is formed so that in cross section it has the shape of an arc of a circle of the same size as the ball 16 and the bore of the hole 15. The hole is bored so that the barrel does not cut open the full diameter of the hole; and the diameter of the barrel 12 at the bottom of the groove 14, being the smallest diameter of the barrel at the place occupied by the groove, is such that it projects a little into the bore of hole 15. This forms a contracting throat into which the ball is yieldingly pressed by a spring 17 seated against a screw plug 18. The hole 15, in which the ball is set, is substantially in the plane of the groove 14, and is approximately perpendicular to the direction of the axis of the barrel 12. When the ball is in place it constitutes a tenon locking the barrel against motion in the direction of its axis, thus preventing it from slipping out of the hole in head 10 in which it is journaled.

The present invention relates to means for locking and unlocking the barrel. This is accomplished by providing a plunger 19 set in the head or stock substantially in line with the axis of the hole 15, and arranged with one of its ends 20 in position to engage the ball 16 and with the other end 21 projecting from the tool.

This may be constructed cheaply by continuing the hole 15 with a smaller bore straight through the stock, and the plunger may be a simple pin having an enlarged head 20 which prevents it from falling out, all the parts being assembled from the end 18. It is contemplated that a tool may be provided with a series of barrels 12 containing different sized sockets or such other tool faces as may be desired.

In ordinary operation, when the handle 11 is turned to the right (Fig. 3) the barrel will be turned in the same direction, because the ball 16 becomes wedged between the barrel and the under wall of hole 15; but when the handle is turned toward the left the ball does not become thus wedged and movement of the handle does not turn the barrel. Upon moving the handle to the right again spring 15 forces the ball into frictional contact with the barrel, where it becomes wedged again; and it is not possible, by the operation of these parts alone, to turn the handle to the right without turning the barrel also. The plunger 19, however, makes it possible to turn the handle freely to the right. The projecting part 21 is located in a place which may conveniently be reached by the thumb or finger of the operator, and by pushing the plunger inward the head 21 engages ball 16, and by this means the ball may be conveniently moved a very short distance out of frictional contact, so that the barrel is freely rotatable with respect to the handle in either direction; and by pushing the plunger further the ball may be moved entirely out of the groove 14, in which case the entire barrel 12 may be slipped out of the head 10 and reversed in position, or a different barrel substituted, having a different tool face.

The applications of this device are many. It is a common characteristic of simple ratchet wrenches that they operate in one direction only, and are generally non-reversible. The present invention provides means for making a simple, reversible wrench without sacrificing the element of strength which characterizes the simple construction. By merely turning the handle over and reversing the barrel the rotatory direction in which the movement of the handle is effective at the wrench socket is reversed. This is accomplished by a single movement of the hand while the plunger is held depressed; or a different barrel may be inserted with equal ease. The ball acts like a latch, snapping into the groove when the barrel is properly placed.

I claim:

1. The combination, with a stock, a barrel journaled therein and a rolling member between them, of a plunger set loosely in the stock and arranged to retract the rolling member.

2. The combination, with a stock, a barrel journaled therein, these parts having cooperating grooves intersect-

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ing nearly tangentially, and a rolling member in the grooves, of means forcing the member yieldingly toward their intersection, and means to eject the rolling member from one of the grooves.

5 3. The combination, with a stock, a barrel rotatable and movable endwise therein, having an annular groove, there being a hole in the stock intersecting said groove nearly tangentially and a ball in the hole, of means forcing the ball yieldingly toward the intersection, and a plunger set

loosely in the stock in line of said hole, one end engaging the ball and the other end projecting externally. 10

In testimony whereof I hereto affix my signature, in presence of two witnesses, at Boston this sixth day of March, 1907.

Witnesses:

M. E. MURPHY,
EVERETT E. KENT.

SOLOMON A. CAMPBELL.