

(No Model.)

E. E. MASTERS.
REVERSIBLE SOCKET WRENCH.

No. 536,754.

Patented Apr. 2, 1895.

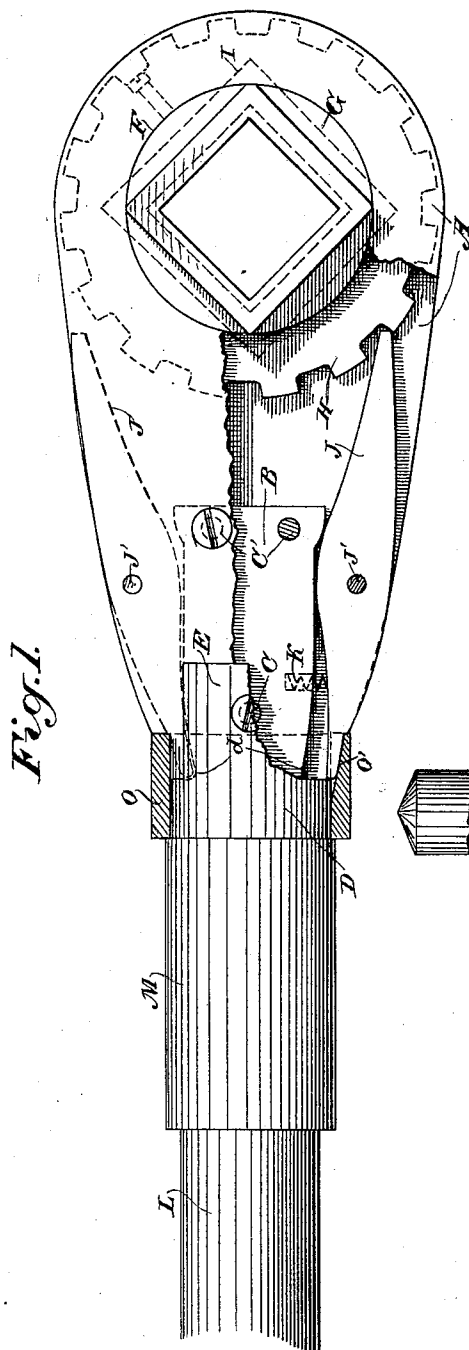


Fig. 1.

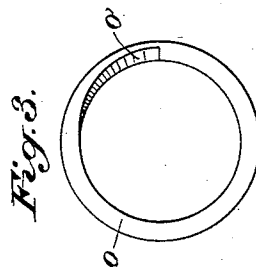


Fig. 3.

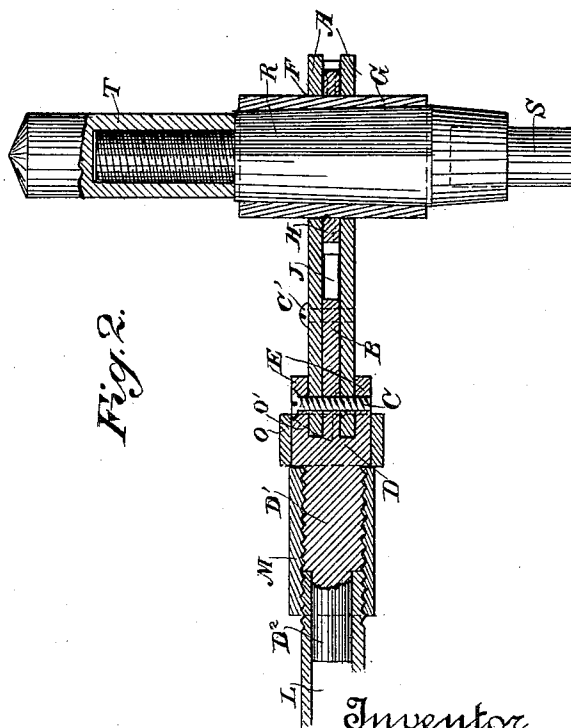


Fig. 2.

Witnesses,
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UNITED STATES PATENT OFFICE.

EGBERT E. MASTERS, OF SACRAMENTO, CALIFORNIA.

REVERSIBLE SOCKET-WRENCH.

SPECIFICATION forming part of Letters Patent No. 536,754, dated April 2, 1895.

Application filed November 30, 1894. Serial No. 530,478. (No model.)

To all whom it may concern:

Be it known that I, EGBERT E. MASTERS, a citizen of the United States, residing in Sacramento, county of Sacramento, State of California, have invented an Improvement in Reversible Socket-Wrenches; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device which is adapted to be used as a wrench for turning nuts, drills, screw-drivers, or other articles or tools in either direction.

It consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a plan view of my device. Fig. 2 is a longitudinal section of the same. Fig. 3 is a view of the cam ring.

The object of my invention is to provide a tool which is adapted to fit and turn nuts or bolts having various sized or shaped exterior, or a socket which is adapted to receive a drill, screw-driver, countersink or other tool, with a means for advancing the tool independent of the socket.

It also consists in the mechanism whereby the direction of rotation of the socket and tool may be reversed at will, and a means for uniting the handle to the head and forming a compound joint at that point.

The head of this tool is formed of two plates A A. These plates are bolted, riveted, or otherwise secured to a flat central tongue B which extends between them from the shank D, of which it forms a part. Exterior to the plates A are extensions E of the shank which clasp the outside of the plates, and by means of a bolt or bolts C, these are strongly secured together, and this, in conjunction with the bolts or screws C' extending through the front portion of the tongue B and through the plates A, makes a union strong enough to resist any ordinary power that may be applied to the tool, while rendering it easy to separate the parts and obtain access to the interior whenever desired. Through the front rounded portion of the plates A are made the holes F, having the same axis, and through these holes extends a hollow socket G, the outside of which is made cylindrical at the point where it passes through the holes, so that it

is easily turnable therein. A ratchet wheel H is fixed to this socket between the plates A so as to turn with it. The socket is made hollow having a rectangular opening extending through it, preferably tapered from one end to the other, and the exterior of one end of this socket is also made rectangular so as to fit and receive a supplemental rectangular socket I which may be applied to it when it is to be used for turning nuts of larger size than the openings at either end of the main socket. Upon each side of the head, between the two plates A, are fulcrumed pawls J, the outer ends of which are adapted to engage the teeth of the ratchet wheel H. The inner ends of these pawls rest upon spiral springs K which serve to force the inner ends outward, and the outer ends into engagement with the teeth of the ratchet, the pawls being pivoted at each side as shown at J'.

The shank D, to which the plates A are secured, is channeled or chambered upon each side, or has sockets formed, as shown at d, into which the inner ends of the pawls extend, so that when any pressure is brought upon either pawl, as in turning any nut or other article which has considerable resistance, the ends of the pawl will abut against the shoulders of the chambers, and thus relieve the fulcrum pins J' of the strain which would otherwise be brought upon them. By this construction the whole cross section of the pawl is available to resist the strain brought upon it in turning a nut or other difficult piece of work.

The shank D has a screw-threaded extension D', and this is turned down to a smaller diameter without screw threads as shown at D².

The handle L is made of steel or other tubing, and has screw-threads cut upon its exterior, corresponding to the threads upon the part D' of the shank, and the interior of the tube is of a size to just receive the extension D² of the shank.

M is a stout sleeve screw-threaded on the interior to fit the threads upon the part D' and the handle L, so that when screwed up closely against the shoulder of D and extending out upon the handle L, it forms a strong compound joint by reason of the extension of the part D² into the tube L.

O is a ring or sleeve fitting and turnable upon the shank D. That portion of the interior of this sleeve adjacent to the plates A, against the rear of which it abuts, has formed in it a cam-shaped slot O'.

The inner ends of the two pawls J project upon each side so as to be of slightly larger diameter than the shank D or the interior of the ring or sleeve O, and when the latter is slipped upon the shank it presses these inner ends of the pawls inwardly against the action of their springs, so that the outer ends are thrown out of engagement with the ratchet wheel H, and the latter is thus free to be turned in either direction.

When it is desired to engage either of the pawls with the teeth of the wheel H, the ring O is turned around until the cam-shaped slot arrives over the inner end of the pawl upon the side toward which it is desired to turn the socket, and the spring, acting upon the pawl, forces it out into this cam-shaped slot, thus allowing the other end of the pawl to fall into engagement with the ratchet while the opposite pawl still remains out of engagement. Under these conditions, when the handle is oscillated back and forth around the socket, the pawl will move over the teeth of the ratchet, when moving in one direction, and will engage them when moving in the other direction, thus forcing the socket to turn in the direction in which the pawl engages the ratchet teeth. If it is desired to reverse the operation, it is only necessary to turn the ring around in the same direction until the inner end of the opposite pawl falls into the cam-shaped notch when it will engage the ratchet, and the pawl previously engaged will be disengaged therefrom. The same movement of the handle will then reverse the movement of the ratchet and the socket piece.

If it is desired to use the device for turning nuts or polygonally headed bolts, the socket will fit the nut to be turned, either at one end or the other, or by the use of the supplemental socket piece, previously described.

If it is desired to use the socket to operate a drill, screw-driver, wrench, or other tool, I employ a shank R which fits within the rectangular socket G, having one end chambered and adapted to receive any of the various tools S which it is desired to use, and which may be secured thereto by set screw or otherwise, and the other end may be screw-threaded to fit a correspondingly threaded socket piece T, the end of which is adapted to rest against any suitable support, so that as the socket G is turned, as previously described, it will turn the tool which is held by it, and either advanced or retracted, as may be desired, by the action of the screw-threaded socket which acts as a feeding device.

When used for turning nuts upon bolts, this device is exceedingly convenient, because if the bolt projects to a considerable distance through the nut, it extends out through the open opposite end of the socket piece, as far

as necessary, and does not interfere with the tightening up and setting of the nut in its proper place.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A socket wrench consisting of the head plates having holes bored through them in line, a hollow socket having a cylindrical exterior turnable in the holes of the head piece and having a ratchet wheel fixed to it between the head plates with teeth adapted to be engaged to turn in either direction, a shank adapted to receive a handle by which the head is turned, said shank having a flattened central portion extending between and bolted to the head plates, with sockets in the shank at its junction with the central portion, pawls pivoted between the head plates having the outer ends adapted to engage the teeth of the ratchet upon the opposite sides and springs by which the inner ends are separated from each other, the inner ends of said pawls abutting against the end walls of the sockets at the base of the central flattened portion of the shank whereby end pressure caused by their engagement with the ratchet is resisted by the chambers of the shank.

2. A reversible socket wrench, consisting of a head formed of plates having holes through the end, a socket having a cylindrical exterior turnable in said holes and a rectangular hole made through it, a ratchet wheel fixed to said socket between the plates, pawls pivoted upon each side between the plates with the outer ends adapted to engage the teeth of the ratchet, and springs by which the inner ends are normally separated, a shank having a flattened central portion extending between the head plates, and exterior extensions embracing the inner ends of said plates, and having in its junction with the central portion, chambers into which the inner ends of the pawls extend, a ring or sleeve surrounding the shank, and loosely turnable in one direction thereon, said sleeve having a cam-shaped slot in its inner side into which either of the pawls will fall when coincident therewith, while the other pawl is pressed down so as to disengage its outer end from the ratchet.

3. A reversible socket wrench consisting of head plates through which the hollow socket extends, having a ratchet fixed to and turnable with it between the plates, and pawls pivoted between the plates upon each side, adapted to engage the ratchet teeth upon opposite sides, the cylindrical shank having a flattened central portion extending between the head plates, and extensions projecting outside of said plates, said interior and exterior portions of the shank being bolted or secured to the plates as herein described.

4. A socket wrench consisting of head plates, a shank having an extension between said plates bolted thereto and exterior extensions outside the plates to which they are

also bolted, a hollow socket turnable in holes made in the opposite ends of the head plates having a ratchet wheel fixed to it between the plates, pawls pivoted between the opposite
5 sides of the plates having the outer ends adapted to engage the teeth of the ratchet upon opposite sides, and the inner ends entering chambers in the shank to which the head plates are secured whereby an abutment
10 is formed to resist the thrust upon the pawls, springs by which the inner ends of the pawls are normally forced outward to throw the outer ends into engagement with the ratchet wheel, a collar or ring loosely turnable about
15 the cylindrical shank, and acting to normally draw the inner ends of the pawls together so as to disengage their outer ends from the ratchet wheel, said sleeve having a cam-shaped slot made inside of it, into which slot
20 the inner end of either of the pawls will fall when the slot is brought into position coincident with said pawl thereby allowing the outer end of the pawl to engage the ratchet while the other pawl is retained out of engagement
25 therewith.

5. A socket wrench consisting of head plates, a hollow socket turnable in holes in said plates having a ratchet fixed thereto between the plates, and pawls pivoted to the plates to engage the ratchet, with mechanism
30 whereby either of the pawls may be engaged and the other one disengaged, a shank having at one end a plate extending between the head plates and exterior extensions clasp-
35 ing the outside of said plates, bolts or rivets by which both are secured through the head plates, screw-threads formed upon the opposite end of the shank and a reduced extension beyond the screw-threads adapted to enter the hollow pipe which forms the handle,
40 and a screw-threaded sleeve fitting the shank and corresponding threads upon the tubular handle whereby the whole is locked together.

In witness whereof I have hereunto set my hand.

EGBERT E. MASTERS.

Witnesses:

S. H. NOURSE,
H. F. ASCHECK.