

W. A. WHITNEY.
RATCHET WRENCH.
APPLICATION FILED FEB. 17, 1912.

1,050,583.

Patented Jan. 14, 1913.
2 SHEETS—SHEET 1.

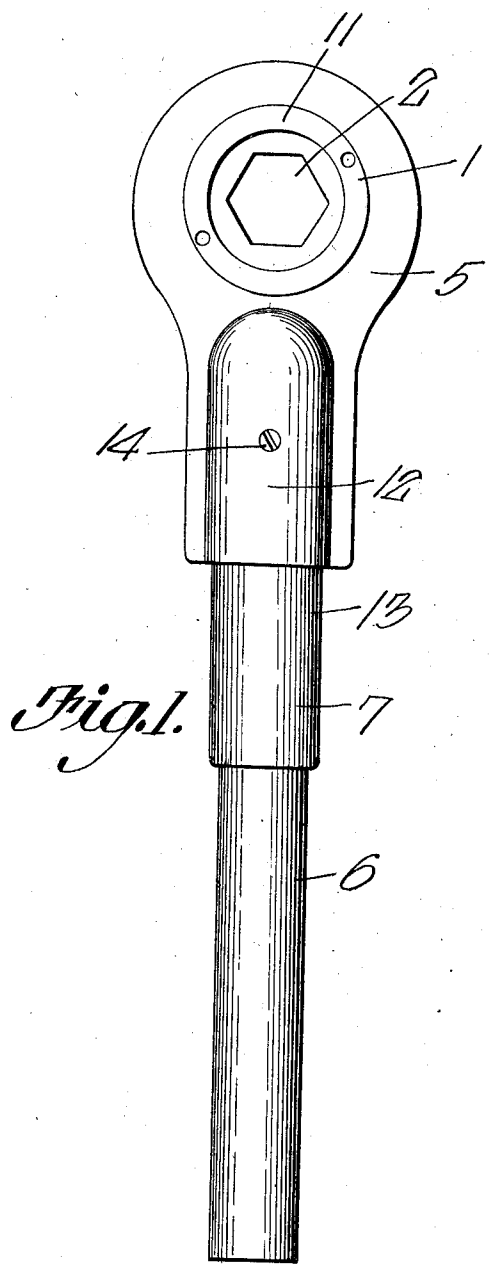


Fig. 1.

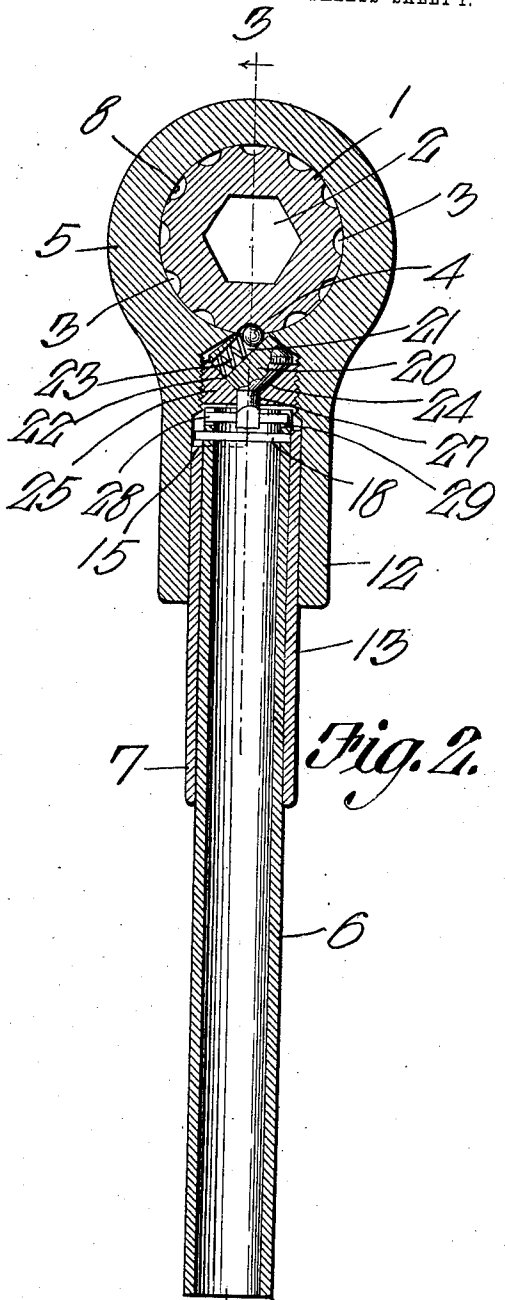


Fig. 2.

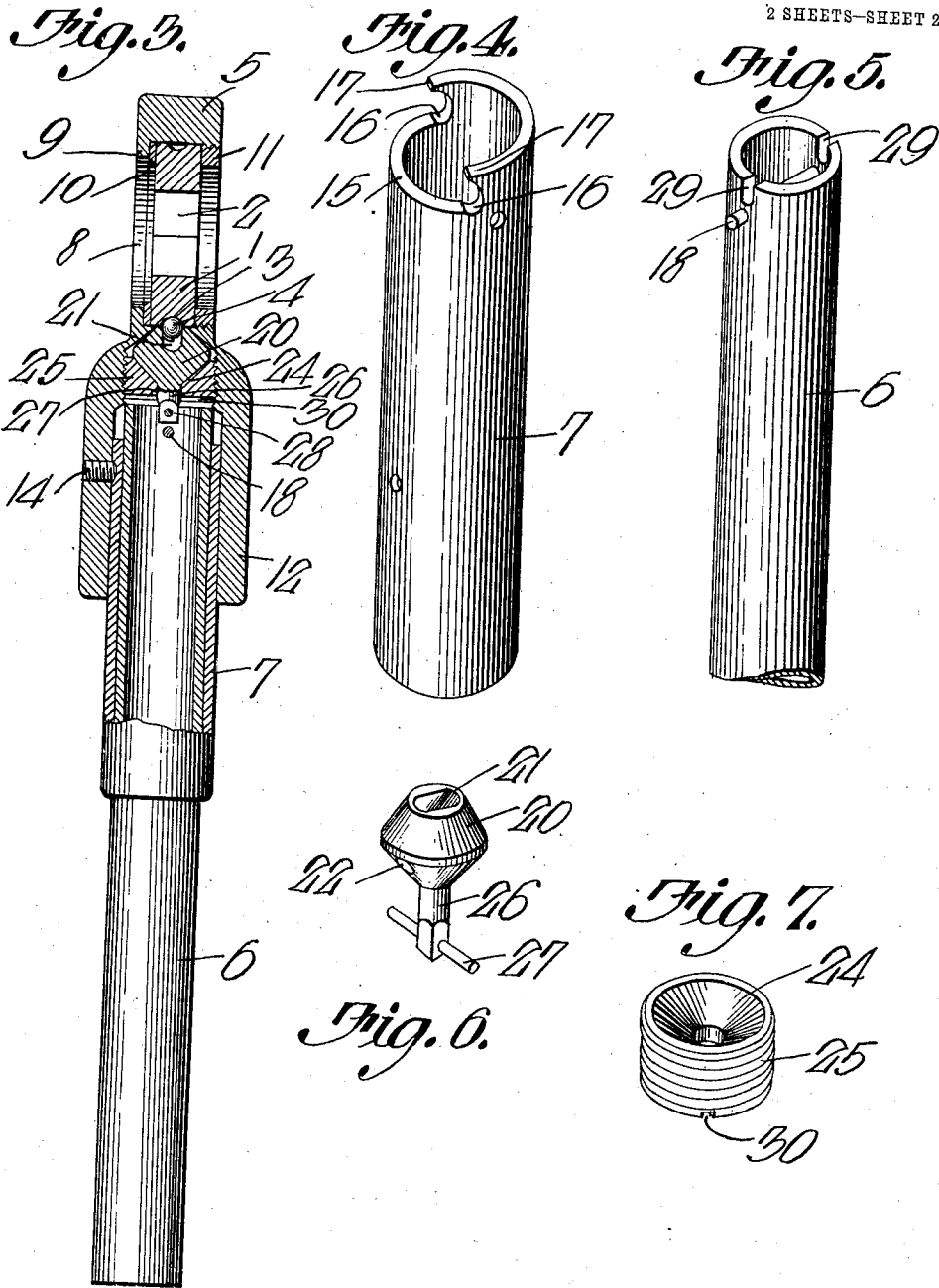
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UNITED STATES PATENT OFFICE.

WILLIAM A. WHITNEY, OF ROCKFORD, ILLINOIS, ASSIGNOR TO WHITNEY METAL TOOL COMPANY.

RATCHET-WRENCH.

1,050,583.

Specification of Letters Patent.

Patented Jan. 14, 1913.

Application filed February 17, 1912. Serial No. 678,252.

To all whom it may concern:

Be it known that I, WILLIAM A. WHITNEY, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented new and useful Ratchet-Wrenches, of which the following is a specification.

This invention relates to wrenches of that type known as ball or ratchet wrenches.

Ratchet wrenches have heretofore been constructed with a rotary head having ratchet teeth and a handle having ratchet members engaging said teeth. Ball members have heretofore been constructed with a rotary head having a smooth periphery and a handle having a plurality of balls therein, one ball being intended to lock the head against rotation in one direction, and the other ball being intended to lock the rotary head against rotation in the other direction, means being provided for holding one of the balls in inoperative position.

Ratchet wrenches are open to the objection that the pawl member of the ratchet is liable to break or wear out. Ball wrenches are open to the objection that the rotary head sometimes slips, although otherwise the ball wrench is stronger than the ratchet wrench.

The object of the present invention is to combine the advantages of the ratchet and ball wrenches, that is, to provide a wrench which has the strength of a ball wrench and the positive action of a ratchet wrench.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawing forming a part of this specification:—Figure 1 is a side elevation of a wrench constructed in accordance with the present invention; Fig. 2 is a longitudinal sectional view through

the construction illustrated in Fig. 1; Fig. 3 is a section on the line 3—3 of Fig. 2; Fig. 4 is a perspective view of the sleeve for holding the hand piece in position; Fig. 5 is a perspective view of the hand piece; Fig. 6 is a perspective view of the rotary cage member for holding the single ball; Fig. 7 is a perspective view of the cage holder.

Like reference numerals indicate corresponding parts throughout the several figures of the drawing.

The wrench of the present invention comprises a rotary head 1 having therein a nut opening 2. The head 1 is provided around its periphery with a plurality of semi-circular recesses or sockets 3 intended to be engaged by the ball 4. The rotary head 1 is mounted in a handle made up of a head frame 5, a hand piece 6 and a hand-piece retaining sleeve 7.

As shown in Fig. 3, the frame 5 has a circular opening 8 cut therethrough and formed with an annular flange 9, against which bears a wear ring or washer 10. The rotary head 1 is placed against the washer 10 and is held thereagainst by a threaded ring 11 screwed into the frame 5.

The frame 5 is provided with an integral socket member 12 into which is fitted a tubular sleeve 7. The sleeve 7 is held in the socket member 12 by means of the set screw 14, shown in Fig. 3. The function of the sleeve 7 is to hold the hand piece 6 in the socket member 12 and yet permit a half rotation of said hand piece. For accomplishing this result, the upper end of the sleeve 7 is fashioned as shown in Fig. 4; that is to say, said sleeve is cut away as indicated at 15, the cut away portion 15 terminating at the end thereof in downwardly extending circular depressions 16 and in overhanging lip portions 17. The hand piece 6 at its upper end, as shown in Fig. 5, is provided with a laterally extending pin 18, which, when the hand piece 6 is assembled inside the sleeve 13, engages the upper edge of the cut away portion 15 and thus prevents the hand piece 6 from being

displaced downwardly. The hand piece 6 can be given a half rotation, any further rotation thereof being prevented by the pin 18 striking against one end or the other of the cut away portion 15, and thus limiting the movement of the hand piece 6. Moreover, when the pin 18 drops down into the depressions 16, at one end or the other of the cut away portion 15, the hand piece 6 is thereby held against rotation until the pin 18 is raised and thus moved out of the depressions 16.

The function of the rotatable handle 6 is to alter the relation of the ball 4 and its cage 20, shown in Fig. 6, with respect to the rotary head 1, so as to operate said head in one direction or the other. When the hand piece 6 is turned so that the pin 18 is at one end of the cut away portion 15, the rotary head 1 will be operated in one direction. When the pin 18 is at the opposite end of the cut away portion 15, the rotary head will be rotated in the opposite direction. The means for accomplishing this result consists of the rotary cage 20 which, as shown in Fig. 6, is preferably formed with upper and lower conical portions. Extending diagonally through the cage 20 is a circular bore 21, the lower end of which is indicated by the numeral 22. The ball 4 is mounted in the diagonal bore 21 and is normally impelled upward by a coiled spring 23. The cage 20 is mounted for rotation in a conical recess 24 in a cage holder 25, shown in Fig. 7. The cage holder 25 is exteriorly threaded and is screwed into the upper end of the socket member 12, so as to hold the cage 20 securely in position, and yet permit its free rotation. The cage 20 is provided with a downwardly extending stem 26 which projects through an opening 27 formed in the cage holder 25, and is provided at its lower end with a cross piece 28, the ends of which are engaged by short longitudinal slots 29 formed in the upper end of the hand piece 6, as shown clearly in Fig. 5. The cage holder 25, as shown best in Fig. 3, is formed in its lower surface with a transverse groove 30 adapted to receive a screw-driver for screwing it in place. The wrench is disassembled by removing the set screw 14 in Fig. 3. This releases the sleeve 7 and said sleeve, together with the hand piece 6, can then be removed from the socket member 22. A screw-driver is then inserted into the groove 30 of the cage holder 25 so as to screw the same out of the socket member 12 and thus release the ball 4 and spring 23.

Constructed as described, the operation of the device is as follows: With the parts arranged as shown in Fig. 2, if it be supposed that the rotary head 1 is engaged by the nut, the hand piece 6 can be freely moved to-

ward the right, the ball 4 being forced a slight distance down the bore 21. When the hand piece 6 is moved to the left in Fig. 2, the ball 4 immediately jams in one of the depressions 3 and against the lower surface of the diagonal bore 21, thus causing the rotary head 1 to be moved to the left with the hand piece. When it is desired to operate the rotary head in the opposite direction, the hand piece 6 is given a half turn so as to reverse the position of the diagonal bore 21.

It is found in practice that the wrench of the present invention has all of the strength of a ball wrench combined with the non-slipping qualities of a ratchet wrench.

What is claimed as new is:

1. A wrench having a handle, a rotary head having ball depressions in the periphery thereof, and a ball adjustable in the handle for rotating the head in two directions.
2. A wrench having a handle, a ball passage therein, a ball in the passage, means for reversing the passage to cause the ball to rotate the ratchet head in different directions, and a head arranged to be engaged by the ball.
3. A wrench comprising a handle, a ball therein, a ball passage, means for reversing the ball passage to cause the ball to rotate the ratchet head in different directions, and a head having ball depressions therein arranged to be engaged by the ball.
4. A wrench comprising a handle made up of a frame and a hand piece, the hand piece being rotatable relatively to the frame, a ball cage rotatable with the hand piece, and having a ball therein, and a head rotatable in the frame and adapted to be engaged by the ball.
5. A wrench having a handle made up of a frame and a hand piece, the hand piece being rotatable in the frame, means for locking the hand piece in the frame and limiting its rotation, a ball cage detachably connected with the hand piece and rotatable therewith, a ball in said cage, and a head rotatable in said frame and adapted to be engaged by said ball.
6. A wrench comprising a handle made up of a frame having a socket member, a sleeve locked in said socket member and having a cut away upper end formed with depressions at the ends of the cut away portion, and a hand piece rotatable in said sleeve and having a laterally extending pin projecting into the cut away portion thereof, said hand piece being formed at its upper end with longitudinal slots, a cage holder screwed into said socket member and having a conical depression therein, a conical cage mounted for rotary movement in said depression, said cage having a diagonally extending ball passage, and a downwardly

extending stem provided with a cross piece
engaging the slots in said hand piece, a ball
in said ball passage, a spring mounted be-
hind said ball, and a rotary head mounted in
5 said frame and having a plurality of ball
depressions in the periphery thereof.

In testimony that I claim the foregoing

as my own, I have hereto affixed my signa-
ture in the presence of two witnesses.

WILLIAM A. WHITNEY.

Witnesses:

STANTON A. HYER,
ROBERT F. MARSHALL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."