

Oct. 9, 1951

J. S. DODGE ET AL
REVERSIBLE RATCHET WRENCH

2,570,779

Filed Oct. 26, 1949

2 Sheets-Sheet 1

Fig. 1.

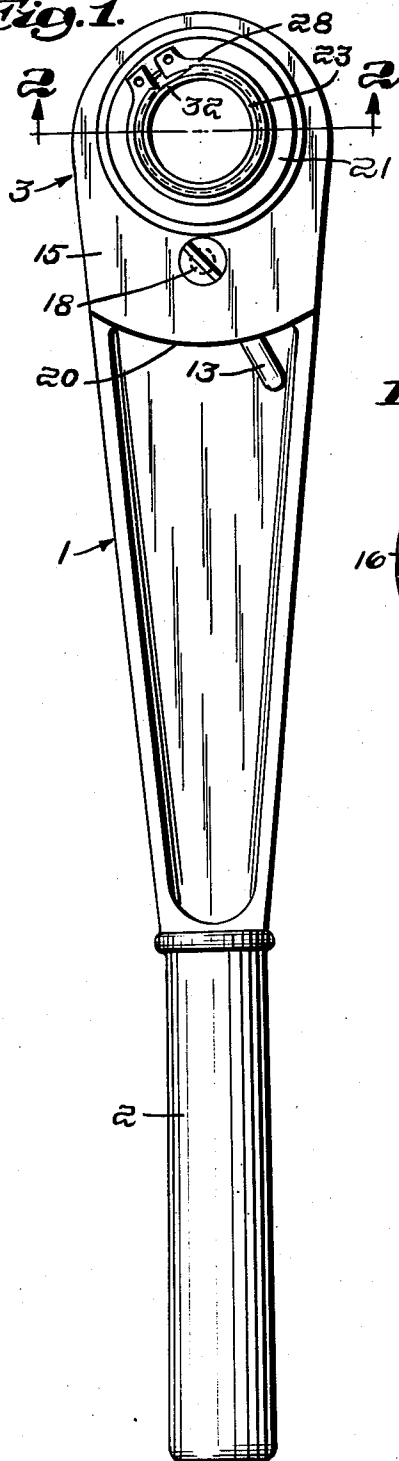


Fig. 2.

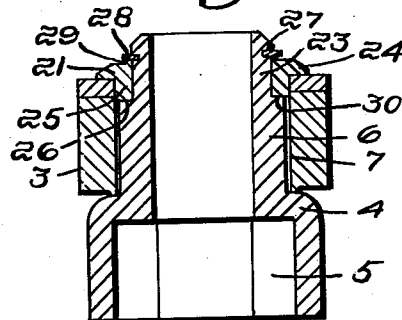


Fig. 3.

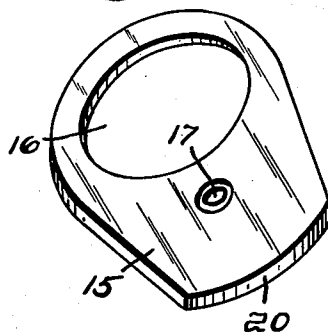


Fig. 4.

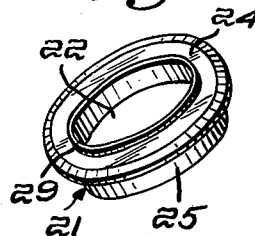
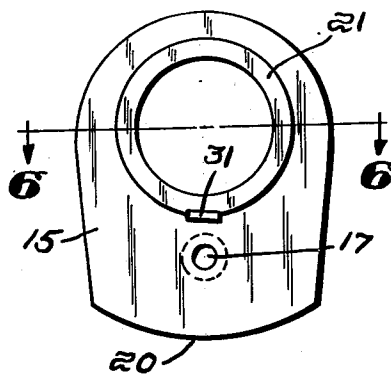


Fig. 5.



Inventors:
John S. Dodge,
Dominic Campanile
by *Harold Smith Tennant*
Attorneys

Oct. 9, 1951

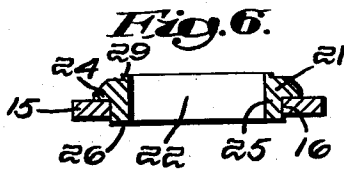
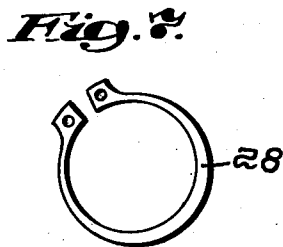
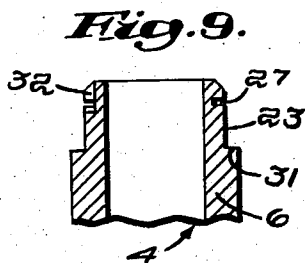
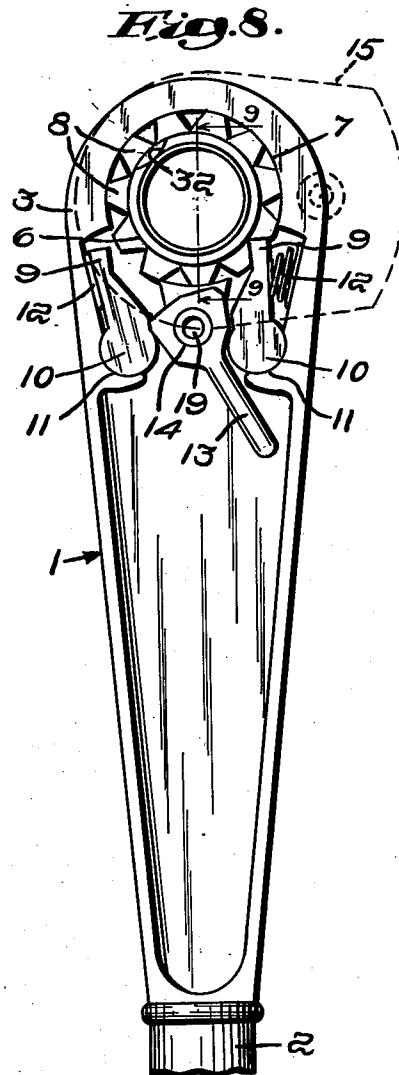
J. S. DODGE ET AL

2,570,779

REVERSIBLE RATCHET WRENCH

Filed Oct. 26, 1949

2 Sheets-Sheet 2



Inventors:
John S. Dodge,
Dominic Campanile,
By *Heard Smith & Tennant*
Attorneys

UNITED STATES PATENT OFFICE

2,570,779

REVERSIBLE RATCHET WRENCH

John S. Dodge and Dominic Campanile, Worcester, Mass., assignors to Lowell Wrench Company, Worcester, Mass., a corporation of Massachusetts

Application October 26, 1949, Serial No. 123,726

1 Claim. (Cl. 81—62)

1

This invention relates to reversible ratchet wrenches and especially to a reversible ratchet wrench of the type shown in U. S. Patent No. 1,798,194, dated March 31, 1931.

The wrench illustrated in said patent is provided with a body member presenting at one end a handle portion of which the wrench is manipulated and at the other end with a socket-receiving head in which is mounted both a rotatable socket member and pawls by which the socket member can be turned in either direction, said pawls being controlled as to their operation by a shipper lever.

In the device illustrated in said patent the socket member is removably retained in the head by means of a retaining collar which is mounted on the projecting end of the socket member and is held in position thereon by a set screw.

Wrenches of this type are sometimes subjected to rather severe usage and it sometimes happens that during such use the set screw holding the retaining collar in place becomes loosened so that the collar will fall off from the wrench thus rendering the wrench unusable.

It is one of the objects of the present invention to provide a novel and simple means for effectively holding the socket member in the head which does not require the use of a set screw or other part which may become loose and thereby lost, and which will continue to be operative and effective so long as the wrench is used.

Another object of the invention is to provide a novel construction according to which the socket-receiving head presents a larger and better all-steel bearing for the socket member thereby prolonging the useful life of the wrench.

In ratchet wrenches of this type the pawls by which the socket member is operated are located in a chamber with which the head is provided, and a cap plate is used for closing the open side of the chamber and thus retaining the pawls in place. In the wrench illustrated in said Patent No. 1,798,194, this cap plate is held in position by a single screw and experience has shown that said screw sometimes becomes loosened and lost. If this happens the cap plate is likely to drop off from the head, in which case there is nothing to retain the pawls in position and they are likely to become displaced.

A further object of our invention is to provide a novel cap plate construction which eliminates any possibility that the cap plate may become separated from the head even though the retaining screw for the cap plate is lost, said cap plate thus being operative to retain the pawls in the pawl-receiving chamber even though the retaining screw for the cap plate is not present.

Other objects of the invention are to improve

2

ratchet wrenches of this type in the various particulars that will be more fully hereinafter set forth and then pointed out in the appended claim.

In the drawings,

Fig. 1 is a plan view of a ratchet wrench embodying our invention;

Fig. 2 is a section on the line 2—2, Fig. 1;

Fig. 3 is a perspective view of the cap plate by itself;

Fig. 4 is a perspective view of the collar member which is assembled with the cap plate to provide a very efficient bearing for the socket member;

Fig. 5 is an under side view of the assembled cap plate and collar;

Fig. 6 is a section on the line 6—6, Fig. 5;

Fig. 7 is a view of the split spring locking ring by which the socket member is retained in the head;

Fig. 8 is a view of the wrench with the cap plate and split locking ring removed; and

Fig. 9 is a fragmentary section through the upper end of the socket member on the line 9—9, Fig. 8.

In the drawings 1 indicates the body portion of our improved wrench which is formed at one end 2 with the handle by which the wrench is manipulated and at the other end with a socket-receiving head portion 3 in which is rotatably mounted the socket member 4, the latter being provided with the usual flat sided socket 5 to receive the nut or the head of the bolt to be turned.

The socket member 4 is formed with a central body portion 6 which extends through and is received in an opening 7 with which the head is provided, the body portion 6 of the socket member being formed with teeth 8 that cooperate with the pawls 9 that are pivotally mounted on the head portion as illustrated in said patent, each pawl being provided with a rounded end 10 that is received in a correspondingly shaped socket 11 with which the body of the wrench is provided. Each pawl is acted on by a spring 12 and the pawls are controlled by a shipper lever 13 pivotally mounted on a post or bearing member 14 with which the head is provided. The shipper is so constructed that when it is swung into the position shown in Fig. 8, the left hand pawl 9 will be thrown into inoperative position and the right hand pawl will be permitted to swing into operative position in engagement with one of the teeth 8 by means of its spring 12. When the shipper is swung to the left in Fig. 8, the right hand pawl will be forced back against the spring into inoperative position and the left hand pawl will move forward under the influence of its spring into its operative position. The parts thus far described are all similar to the

corresponding parts in the above-mentioned Patent No. 1,798,194. The pawls 9 are retained in their proper positions in the head by means of a cap plate 15, and in the present invention this cap plate has an exterior contour similar to that of the head 3 and is formed with an opening 16 through which the body portion 6 of the socket member extends. Said cap plate is provided with a screw-receiving opening 17 to receive a retaining screw 18 which is screw threaded into a screw threaded opening 19 formed in the post or projection 14 on which the shipper lever 13 is pivotally mounted. The dimension of the cap plate in the direction of the length of the wrench is such that the shipper lever 13 projects beyond the edge 20 of the cap plate and is thus exposed for manual manipulation.

Associated with the cap plate 15 is a bearing collar 21 provided with an opening 22 through which the socket member extends, said socket member being formed at its end with a portion 23 of reduced diameter which fits the opening 22 in the collar. The body portion of the collar has an exterior diameter to snugly fit the opening 16 in the cap plate 15, and in fact said collar and cap member are press fitted together so that when the collar has been forced into the opening 16, the assembled collar and cap plate become practically an integral structure. The collar 21 is provided with a peripheral flange 24 which overlies the top of the cap plate 15 and the portion of the collar beneath the flange 24 is slightly longer than the thickness of the cap plate 15 so that when the collar and cap plate are assembled as shown in Fig. 6, the lower end portion 26 of the collar projects below the under face of the cap plate.

When the assembled cap plate and collar are in turn assembled with the head, the extended portion 26 of the collar sets into the upper end of the opening 7 in the head and thereby assists in retaining the cap plate in position on the head.

The socket member 4 extends slightly above the collar 21 and the extended portion is provided with an annular groove 27 to receive a split locking ring 28 by which the socket member is retained in its operative position in the head. The collar 21 is shown as having an annular lip 29 which extends slightly above the flange 24 and on which the split spring locking ring 28 rests when it is occupying the groove 27.

When the parts are assembled as shown in Figs. 1 and 2 the shoulder 30, which results from forming on the socket member the portion 23 of reduced diameter, engages the under face of the collar and the lip 29 on the collar engages the under side of the split spring locking ring 28. The socket member is thus securely and effectively retained in position in the head without the use of any screws or other parts which may become loosened or lost. Furthermore the collar provides a long and sturdy bearing for the upper end of the socket member, all of which contributes to lengthen the useful life of the wrench. In addition it is proposed to make the collar of steel which adds another element extending the useful life of the implement.

It will be observed that since the cap plate 15 and the collar are press fitted together and thus form in effect an integral structure, and since the lip 29 of the collar engages the under side of the split spring locking ring, the latter constitutes means for holding the cap plate in position against the side face of the head por-

tion 3 of the wrench. Said cap plate is normally held in the position shown in Fig. 1 by the screw 18.

If it should be that the attaching screw 18 becomes loosened and lost, the cap plate 15 will still be retained on the wrench against the side face of the head by means of the split spring ring 28, and while with the screw 18 absent there would be nothing to hold the cap plate from turning about the projecting portion of the socket member, yet if said cap plate should swing into the dotted line position Fig. 8, or any other improper position, it would still overlie a sufficient portion of each of the pawls 9 and the shipper lever 13 to retain them in operative position so that the wrench would continue to be usable with the retaining screw 18 missing.

If desired the portion 26 of the collar that projects below the cap plate 15 may be peened or swaged over at one place as shown at 31 thereby to add to the security with which the collar and cap plate are held in their assembled relation and to prevent the collar from rotating in the cap plate.

It is proposed to provide the upper end of the socket member with a notch or cutaway portion 32 to assist in removing the split spring ring 28 if and when it is desired to remove the socket member from the head of the wrench. This notch 32 is of sufficient depth to permit a screw driver or other similar implement to be introduced inside of the split ring 28 at one of the ends thereof as shown in Fig. 1 for the purpose of expanding the ring sufficiently to remove it from the groove 27.

We claim:

In a ratchet wrench of the type presenting a head having a socket-receiving opening there-through to receive a rotatable toothed socket member, and also having a pawl-receiving chamber in one side face thereof to receive pivotally mounted pawls for actuating said socket member, the combination with a toothed socket member rotatably mounted in said opening and having an end portion projecting beyond said side face of the head, of a cap plate for closing the pawl-receiving chamber in said head, said cap plate having an opening therethrough located entirely within and spaced from the periphery thereof, through which opening the projecting end of the toothed socket member extends, an annular collar fitting said opening and surrounding the socket member, said collar providing a bearing for the socket member, the projecting end of the socket member having a circumferential groove located immediately beyond the collar, and a split spring ring removably received in said groove and by its engagement with the collar serving both to hold the toothed socket member in the head and to prevent the separation of the cap plate from the head.

JOHN S. DODGE.
DOMINIC CAMPANILE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
582,481	Nolan	May 11, 1897
1,752,865	Thorpe et al.	Apr. 1, 1930
1,798,194	Dodge	Mar. 31, 1931
2,510,377	Carr	June 6, 1950