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W. J. O'NEILL

RATCHET WRENCH

Filed June 5, 1926

Fig. 1.

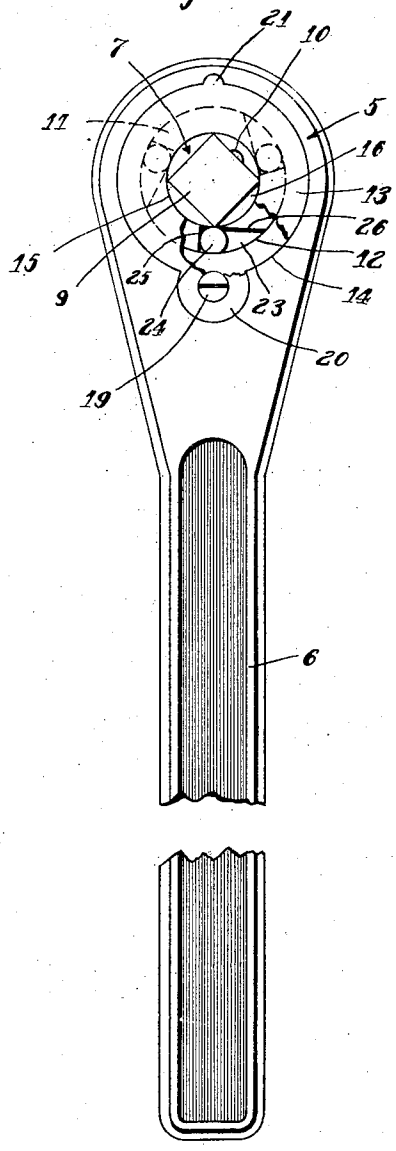
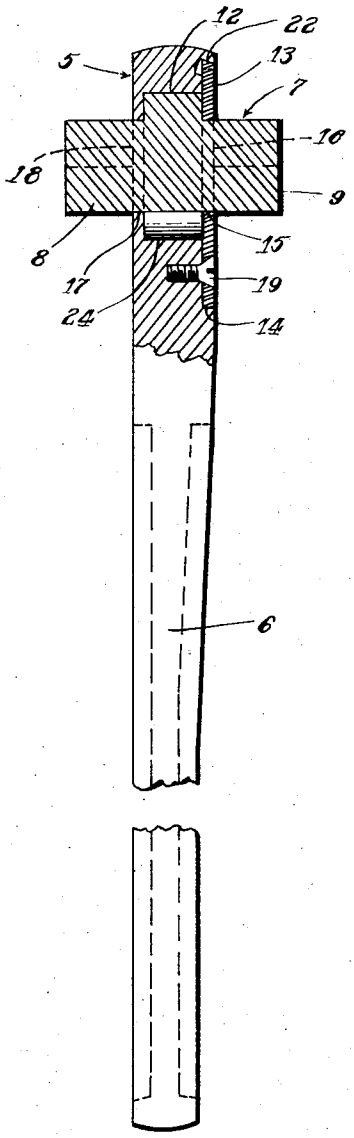


Fig. 2.



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RATCHET WRENCH.

Application filed June 5, 1926. Serial No. 113,867.

This invention relates to wrenches of the ratchet type.

The principal object is to provide an extremely strong and durable tool of the kind referred to which is, moreover, very simple in construction and economical to manufacture, the tool embodying a roller clutch drive in place of a pawl and ratchet drive or other equivalents, to afford the desired increased strength, durability, simplicity and economy of manufacture.

Another object is to provide a tool of this kind having shank portions projecting therefrom in opposite directions for alternative use in the turning of the work in either direction, the roller clutch in this case affording a drive in either direction without the instrumentality of complicated and expensive forms of mechanisms which are otherwise required in other forms of ratchet wrenches.

The invention is illustrated in the accompanying drawing, wherein—

Fig. 1 is a face view of a wrench made in accordance with my invention, a portion of the plate thereof being broken away to disclose the parts therebeneath and other parts being shown in dotted lines for the purposes of clear illustration; and

Fig. 2 is a side view of Fig. 1 with the head end of the wrench appearing in longitudinal section.

The wrench comprises a forged body 5 providing a handle 6 and a head end for the reception of the head 7. The latter is provided with opposed shank or post portions 8 and 9 suitably faceted and provided with spring pressed balls 10 projecting from the facets thereof to hold socket pieces thereon in a manner well understood in the art. So far as the operation of the wrench is concerned it is, of course, immaterial as to what form of tool elements are mounted upon or otherwise operated by the head 7, it being obvious that by suitable modification of the tool the same may be adapted for the turning of drills, taps, reamers, dies and the like. The head 7 has a cylindrical portion 11 bearing in a cylindrical socket 12 provided in the body 5. The socket 12 opens from one side of the handle as shown and is closed by a plate 13 fitting in a depression 14 provided in the side of the handle whereby to lie flush with the surface of the handle and present a neat and workmanlike appearance. The plate 13 serves to retain the head 7 in place by confining the cylindrical portion 11 thereof in the socket 12. The plate 13 has a circular opening 15 therein to receive a cylindrical portion 16 provided at the base of the shank 9 so that the plate provides a bearing for the shank 9. Another opening 17 is provided in the body 5 at the base of the socket 12 for the reception of the cylindrical portion 18 of the shank 8. The plate 13 is retained in position by a screw 19 passing through an opening in a lug 20 provided on the plate 13. Diametrically opposite from the lug 20 is a small semi-circular nib 21, the edges of which are beveled, as indicated in Fig. 2, to retain the plate in position when the nib is engaged in the recess 22 drilled at an angle into the handle 6. In this way a single screw serves to hold the plate 13 in position and the matter of assembling the wrench is, of course, simplified.

The periphery of the cylindrical portion 11 of the head 7 is relieved or cut away to provide a plurality of notches 23 for the reception of rollers or pins 24. The one side 25 of the notch 23 is made approximately parallel to the radius of the head 7 and the other side 26 is made substantially at right angles thereto and is thus in converging relation to the adjacent side wall of the socket 12. The wall of the socket 12 and the sides 26 of the notches 23 provide cooperating wedging driving surfaces for the rollers 24 whereby when the handle 6 is turned counter clockwise in relation to the head 7 as the parts are viewed in Fig. 1, the rollers 24 jam and turn the head 7 with the handle. If, however, the handle 6 is turned in a clockwise direction with relation to the head 7 the roller clutch described overruns and the head 7 is not turned with the handle. Assume, for example, that the shank 8 bears a socket engaged with a nut or other piece of work to be turned it will then be obvious that the wrench will progress the nut in a counter clockwise direction by successive oscillations of the handle 6. In the case of a nut having a right hand thread it is obvious that such operation will loosen the same. If then the socket is removed from the shank 8 and placed on the shank 9 and the operation just referred to repeated, the nut will then be progressed in a clockwise direction and in the case of a nut having a right hand thread the same would, of course, be tightened.

It is found that the roller clutch releases and engages practically as quickly. The wrench can, therefore, be operated to good advantage in a cramped space where only a short handle stroke is possible. This is, of course, of great importance and is one feature of advantage, among others, which the tool of the present invention has over the ordinary pawl and ratchet type of wrench where the handle stroke was necessarily fixed by the particular spacing of the teeth of the ratchet. Aside from this advantage the wrench of the present invention is much stronger and more durable than wrenches of the ratchet type heretofore available. In the ordinary wrench the ratchet discs and pawls had to be replaced frequently due to the friction on the teeth. In this case, however, the rollers or pins take the brunt of the work and are of a particularly highly resistant steel. In the event they crack or wear out it is a matter of very little expense and trouble to remove the cover plate and replace these parts, thus making the old wrench as good as new. It will be clear that less parts are used and these are simpler in form than have been used in the past. The initial cost is, therefore, much less and upkeep expense is reduced to a minimum.

It is believed that the foregoing description conveys a clear understanding of the invention and of its purposes and advantages so that any one skilled in the art to which the invention relates will appreciate the possible applications thereof.

I claim:

1. In a tool of the character described, a handle having a socket opening from one side of the handle and provided with a concentric opening through the handle at the base of said socket, said opening being of reduced diameter, a tool element having an enlarged ratchet portion fitting in said socket either to rotate therein or to be turned with said handle, said ratchet portion having cooperating ratchet elements in said socket, said tool element having a reduced shank portion extending through the aforesaid opening to have connection with the work, said shank portion being cylindrical adjacent the enlarged ratchet portion and bearing closely within the aforesaid opening, another reduced shank portion extending from the opposite sides of said enlarged ratchet portion of said tool element on the other side of said handle and arranged for connection with the work, said shank portion being likewise cylindrical adjacent the enlarged ratchet portion to provide a bearing surface, and a retaining plate for said tool element and the ratchet elements disposed therewith in the handle socket, said plate providing an opening to receive the bearing portion on the last mentioned shank portion of said tool element and having means whereby the same is fastened onto the handle.

2. In a tool of the character described, a handle having a socket therein opening from one side of the handle, a tool element having an enlarged ratchet portion fitting in said socket either to rotate therein or to be turned with the handle, said ratchet portion having cooperating ratchet elements disposed therewith in said socket, said tool element having a reduced shank portion extending from the enlarged ratchet portion for connection with the work, and a plate for closing said socket to retain the ratchet portion and its cooperating ratchet elements, said plate having an opening for passing the plate over the reduced shank portion, a holding nib provided on said plate at one side thereof, the outer edge of said nib being beveled, said handle having a recess for the reception of said nib, the side wall of said recess being inclined to conform approximately to the bevel of said nib whereby to hold the plate in position on said handle, and a perforated lug provided on said plate on the diametrically opposite side from the nib and having a fastening screw passing through the opening therein for securing the plate to the handle.

In witness of the foregoing I affix my signature.

WILLIAM J. O'NEILL.