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J. SAYER

SOCKET WRENCH

Filed April 18, 1922

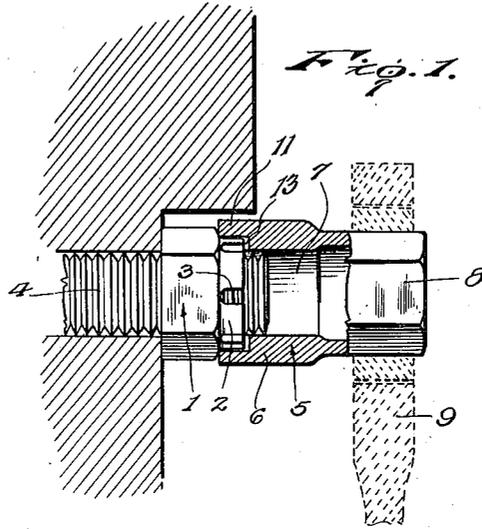


Fig. 2.

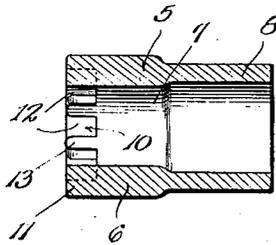


Fig. 3.

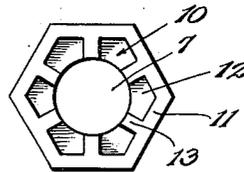
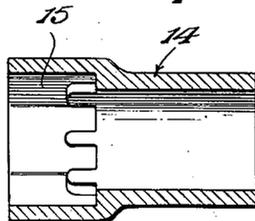


Fig. 4.



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# UNITED STATES PATENT OFFICE.

JOHN SAYER, OF STONE LAKE, WISCONSIN.

## SOCKET WRENCH.

Application filed April 18, 1922. Serial No. 555,191.

*To all whom it may concern:*

Be it known that I, JOHN SAYER, a subject of the King of Great Britain, residing at Stone Lake, in the county of Sawyer and State of Wisconsin, have invented certain new and useful Improvements in Socket Wrenches, of which the following is a specification.

This invention relates to improvements in socket wrenches and more particularly to the socket members of wrenches of this type, the primary object of the invention being to provide a socket so formed as to specifically adapt it for application to castellated nuts and to insure of a firm and secure engagement of the socket member with the nut in threading the latter onto and from its bolt. It frequently happens that these nuts, which are generally employed on automobiles and similar mechanical structures, are located so close to a projecting part as to render it impracticable to fit a socket wrench over the nut in a manner to secure a firm hold, the projecting part frequently lying so close to the sides of the nut as to offer an obstruction to the side of the socket member. Under these conditions a wrench of some other type must be employed and the operation of loosening or tightening the nut is rendered tedious and difficult. The present invention however contemplates taking advantage of the presence of the cotter pin grooves which are formed in the face or end of a nut of this type, by so forming the socket member of the wrench as to adapt it to coact with the walls of these grooves in securing a hold upon the nut.

In the accompanying drawings:

Figure 1 is a longitudinal sectional view through a wrench socket member embodying the invention applied to a castellated nut which is shown in elevation;

Figure 2 is a similar sectional view through the socket member removed from the nut;

Figure 3 is an end elevation of the socket member; and

Figure 4 is a view similar to Figure 2 illustrating a modified form of the invention.

Figure 1 of the drawings illustrates in a general way the application of the principles of the invention and in this figure the numeral 1 indicates a castellated nut of the usual form provided with the usual cylindrical extension at one end indicated by the

numeral 2 in which are formed the diametric grooves or notches 3 which receive the usual cotter pin passed through the bolt 4 onto which the nut is threaded. The body portion of such a nut is of the usual polygonal form adapting it for the application thereto of wrenches of various types. Frequently such nuts are employed in places more or less inaccessible and so close to projecting parts as to preclude the possibility of fitting the socket member of a wrench of the type mentioned over the body portion of the nut in such a manner as to engage the faces thereof. Under these conditions it becomes necessary to employ a wrench of some other type although the location of the nut might indicate the necessity of using a socket ratchet wrench because of the close confines of the space in which the nut is located. As previously stated it is therefore the object of the present invention to provide a socket member for a ratchet wrench of the type mentioned which may be employed under these conditions to obtain a firm hold upon the nut in tightening and loosening it.

The socket member above referred to, and in that embodiment illustrated in Figures 1, 2 and 3 of the drawings, is indicated in general by the numeral 5 and the same comprises the usual body 6 having an axial opening or bore 7 extending therethrough. At one end the body is exteriorly of polygonal form as indicated by the numeral 8 to adapt it for application to the ratchet head of the wrench which is conventionally illustrated in dotted lines in Figure 1 and indicated by the numeral 9. The body 6 at its other end may be of any desired exterior contour but the bore 7 is preferably enlarged so as to form a well defined socket 10 having a bounding or side wall 11 and a bottom wall 12. This socket may be of greater or less depth but preferably of a depth to accommodate the usual extension 2 of the nut, and it may be of the polygonal contour illustrated in Figure 3 of the drawings or of a contour to more closely fit the said nut extension. In any event a number of lugs 13 are cast or otherwise provided within the socket 10 and extend radially inwardly from the wall 11 and preferably the entire depth of the socket, terminating at their inner ends at the wall of the bore 7. These lugs 13 are so arranged that their disposition will correspond to the disposition of the grooves or notches 3 and as a conse-

5 quence when the socket member is applied  
 at its end to the extension 2 of the nut, the  
 lugs 13 will seat in the notches 3 and a firm  
 purchase is thus obtained although the  
 10 socket member does not fit completely over  
 the nut as is ordinarily the case. By form-  
 ing the socket member in the manner above  
 described, it is adapted for application to  
 nuts which are located so close to projecting  
 15 parts as to preclude the application of  
 socket members of the ordinary type and  
 therefore by the use of this socket member  
 I am enabled to employ a ratchet wrench  
 under conditions where otherwise it would  
 20 be necessary to resort to the use of other  
 types of wrenches not well adapted to the  
 particular work.

25 Figure 4 of the drawings illustrates a  
 slight modification of the invention and in  
 this form the socket member which is indi-  
 cated in general by the numeral 14 is formed  
 with a socket 15 corresponding to the socket  
 12 in every respect except that it is of suf-  
 ficient depth to adapt it to receive not only  
 30 the projecting part 2 of the nut but also the  
 body portion thereof. Of course where it  
 is possible to employ a socket member of this  
 type, an even more secure purchase may be  
 obtained upon the nut as the walls of the  
 socket 15 will engage the faces of the nut  
 at the same time the lugs 13 are in engage-  
 ment in the notches in the nut extension.  
 As before stated, the lugs 13 terminate at  
 their inner ends at the wall of the bore or

opening 7 so that their inner end edges are 35  
 flush with the said wall whereby the open-  
 ing will be adapted, at the initial applica-  
 tion of the socket, to receive the bolt onto  
 which the nut is threaded and thus center 40  
 the socket and permit of its rotation about  
 the axis of the bolt until the lugs have been  
 brought to position opposite the notches in  
 the nut.

Having thus described the invention, what  
 is claimed as new is: 45

A wrench socket comprising a body pro-  
 vided with an opening extending longitudi-  
 nally therein and enlarged in diameter at  
 one end of the body to provide a socket to 50  
 accommodate the notched extension of a  
 castellated nut, and lugs formed radially  
 within the said socket and extending across  
 the bottom wall thereof to engage in said  
 notches, the inner edges of said lugs being 55  
 flush with the wall of the opening in the  
 body whereby the said opening will be  
 adapted, at the initial application of the  
 socket, to receive the bolt onto which the  
 nut is threaded and thus center the socket 60  
 and permit of its rotation about the axis  
 of the bolt until the lugs have been brought  
 opposite the notches in the nut.

In testimony whereof I affix my signature.

JOHN SAYER. [L. S.]

Witnesses:

GEO. H. STUBBINS,  
 SIDNEY G. MASON.