March 18, 1924. 1,487,295

W. J. TROWBRIDGE

SOCKET WRENCH

Filed June 11, 1923

Fig. 1.

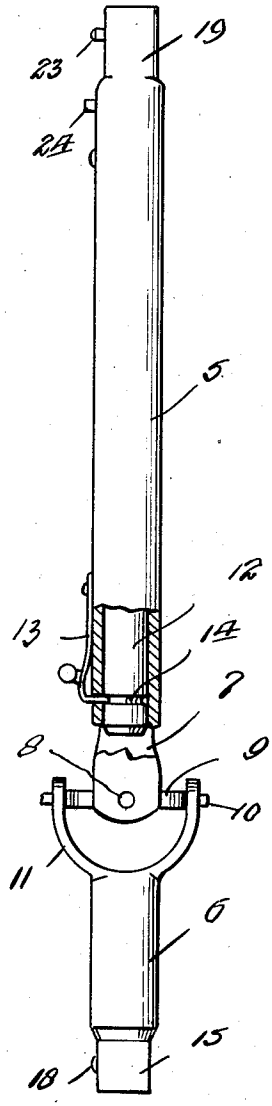


Fig. 3

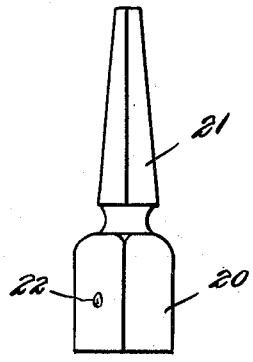


Fig. 4.

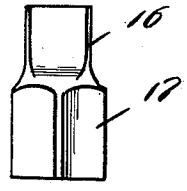
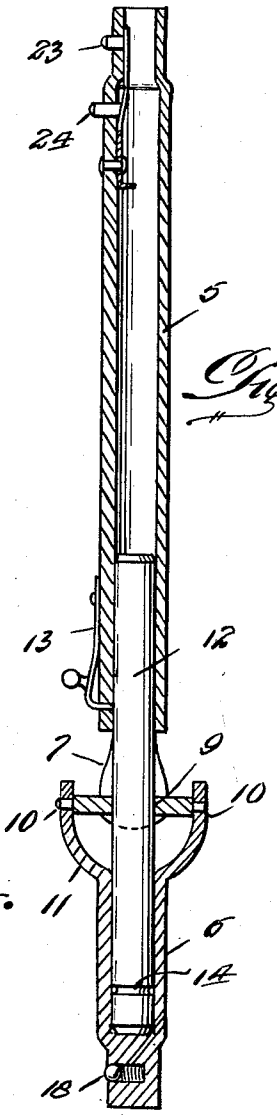


Fig. 2.



Witnesses:

F. L. Fox,

H. Berman

W. J. Trowbridge,
Inventor

By Marion & Marion

Attorney

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UNITED STATES PATENT OFFICE.

WILLIAM JENNINGS TROWBRIDGE, OF CHESTER, TEXAS.

SOCKET WRENCH.

Application filed June 11, 1923. Serial No. 644,631.

To all whom it may concern:

Be it known that I, WILLIAM J. TROWBRIDGE, a citizen of the United States, residing at Chester, in the county of Tyler and State of Texas, have invented certain new and useful Improvements in Socket Wrenches, of which the following is a specification.

In carrying out the present invention, it is my purpose to provide a highly novel form of socket wrench, wherein different sizes and shapes of socket elements may be used for applying or removing nuts of different sizes or shapes, and wherein the wrench may be employed for removing nuts from points that are otherwise inaccessible, the shank of this wrench comprising a pair of sections that are joined together by a universal joint, whereby the same may be extended at an angle to the nut being removed or applied, and rotated for thereby applying or removing the same.

The primary object of the invention is the provision of such a wrench that is comparatively simple of construction, and one that is well adapted for the purposes intended.

A still further object of the invention is to provide a wrench wherein the said sections of the shank may be rigidly joined together, whenever it is found desirable.

The nature and advantages of the invention will be better understood when the following detailed description is read in connection with the accompanying drawing, the invention residing in the construction, combination, and arrangement of parts as claimed.

In the drawing forming part of this application, like numerals of reference indicate similar parts in the several views, and wherein:

Figure 1 is a side elevation, partly in cross section of my improved wrench, the sections thereof being joined together, through the medium of a universal joint for providing a universal movement therebetween.

Figure 2 is a detail vertical cross section of the wrench, the sections thereof being shown as rigidly secured together.

Figure 3 is an elevation of a socket element that is formed with a bracing bit receiving shank, this element adapted for positioning over the upper end of the wrench, whereby the same may be rotated through the medium of a desirable form of bracing bit, and

Figure 4 is an elevation of the form of socket element employed in conjunction with this invention.

With particular reference to the drawing, my improved wrench comprises an upper elongated tubular element 5, and a lower tubular element 6 of considerably lesser length than the element 5. The opposite ends of the tubular element 5 are open, and formed upon the lower open end of this element and at diametrically opposite sides thereof are outwardly extending pendent legs 7, each of which is formed with an opening for the reception of laterally directed pins 8, that are formed upon opposite sides of a disk 9. This disk 9 is further provided with other outwardly directed pins 10 that engage through openings in the outwardly and upwardly extending legs 11 formed upon the upper open end of the lower tubular element 6.

The specific connection between the elements 5 and 6 will afford a universal movement between the elements, whereby the element 6 may be rotated by the rotation of the element 5, even though the same be extended at right angles to the element 6, for thereby permitting the positioning and removal of nuts upon bolts at inaccessible points. As a means for providing a rigid connection between the tubular elements 5 and 6, a rod 12 is slidably positioned within the tubular element 5, and is normally maintained therein by a spring clip 13, that is provided with an inwardly provided lower end that extends through a slot in the tubular element 5, and is adapted for engagement within a circumferential groove 14 of the rod. The said disk 9 is provided with a central opening 9′, whereby when the spring clip 13 is raised, the rod 12 will engage through the opening and position in the tubular member 6 as clearly shown in Figure 2.

The lower end of the tubular element 6 is closed and is formed with a square-shaped extension 15 for engagement within the square-shaped upper socket 16 of a socket element 17, it being understood in this connection, that any number of these socket elements may be employed in conjunction with the wrench, whereby nuts of different sizes and shapes may be applied or removed. For maintaining the socket element upon

the squared end 15 of the tubular element 6, this squared element is provided with a spring pressed ball 18 for obvious purposes. The upper end of the tubular element 5 is formed with an extension 19, and is adapted for receiving the socket element 20, Figure 3, this socket element being formed with a shank 21 for receiving a desirable form of bracing bit, whereby the wrench may be rotated. This extension may also receive the ratchet lever arm, such as used in standard socket wrench sets. The socket element 20 is provided with an opening 22 for the reception of a spring pressed pin 23, which affords a means for securing said socket element to the upper squared end 19 of the tubular member 5. A pin 24 projects outwardly of the tubular element 5, and affords a means for forcing the spring and consequently the pin 23 inwardly, whereby the socket 20 may be removed.

In view of the above description, it will at once be apparent that I have provided a highly novel form of socket wrench, and one that will answer all of the purposes above ascribed, and even though I have herein set forth the most practical embodiment of the invention, it is nevertheless to be understood that minor changes may be made therein, without departing from the spirit and scope of the invention as claimed.

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

In a wrench of the class described, a shank portion comprising a pair of hollow sections, one of said sections adapted to have positioned thereon socket elements, the other of said sections adapted to have secured thereto a desirable form of operating handle, a universal joint connection between said sections, a rod positioned within one of said sections, means for maintaining said rod in said section, said rod adapted for engagement between both of said sections for providing a rigid connection between the sections.

In testimony whereof I affix my signature.

WILLIAM JENNINGS TROWBRIDGE.