June 24, 1924. 1,498,712

P. YORK

UNIVERSAL JOINT WRENCH

Filed June 9, 1921

Fig. 1

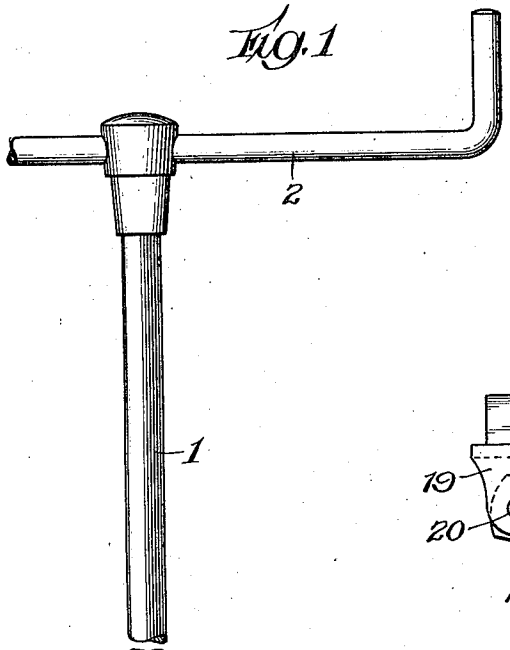


Fig. 6

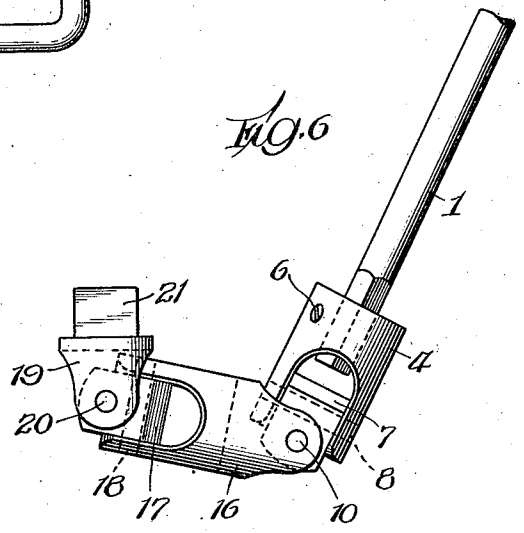


Fig. 2

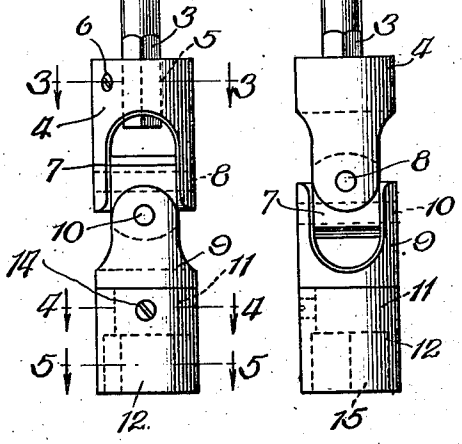


Fig. 7

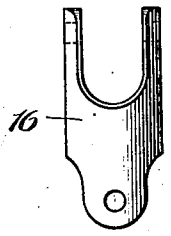


Fig. 8

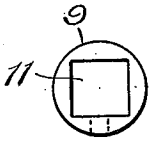


Fig. 9

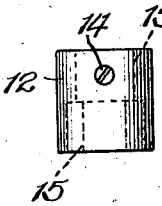


Fig. 10

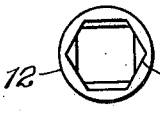


Fig. 3

Fig. 4

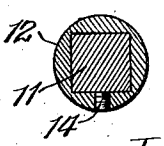
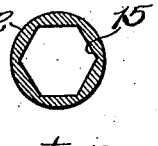


Fig. 5



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UNITED STATES PATENT OFFICE.

PERCY YORK, OF DULUTH, MINNESOTA.

UNIVERSAL-JOINT WRENCH.

Application filed June 9, 1921. Serial No. 476,346.

To all whom it may concern:

Be it known that I, PERCY YORK, a citizen of the Dominion of Canada, and a resident of Duluth, county of St. Louis, State of Minnesota, have invented a certain new and useful Improvement in Universal-Joint Wrenches, of which the following is a specification.

This invention relates to wrenches of the kind in which a universal joint is employed to permit rotation of the handle of the wrench about an axis extending at an angle to the axis of the nut or bolt to be turned, thus adapting the wrench for use in situations where an ordinary wrench could not be employed, or in places where it would be inconvenient and difficult to use an ordinary wrench.

Generally stated the object of the invention is to provide a novel and improved wrench of the foregoing general character in which the construction is such that a single universal joint assembly and a double universal joint assembly are adapted to be used interchangeably on one and the same rod or handle and in which a plurality of sockets are adapted to be used interchangeably on either the single universal joint assembly or the double universal joint assembly in order to adapt the wrench for use in various situations and in connection with bolts and nuts of different sizes.

It is also an object to provide certain details and features of construction and combinations tending to increase the general efficiency and the desirability of a universal joint wrench of this particular character.

To these and other useful ends the invention consists in matters hereinafter set forth and claimed and shown in the accompanying drawings in which—

Figure 1 is a side elevation of a wrench involving the principles of the invention, showing portions of the handle broken away for convenience in illustration.

Figure 2 is a similar view of another side of the universal joint assembly of said wrench, showing the greater portion of the handle broken away or omitted.

Figure 3 is a cross section on line 3—3 in Figure 1.

Figure 4 is a cross section on line 4—4 in Figure 1.

Figure 5 is a cross section on line 5—5 in Figure 1.

Figure 6 is a side elevation of the double universal joint assembly.

Figure 7 is a detail view of one of the parts of said double universal joint assembly.

Figure 8 is an end view of one of the parts of said assembly.

Figure 9 is a side elevation of one of the sockets of the wrench.

Figure 10 is an end view of said socket.

As thus illustrated, the invention comprises a rod 1 of any suitable or desired length having a transverse handle 2 at one end and a polygonal portion 3 at its other end. The single universal joint assembly shown in Figures 1 and 2 comprises a fork 4 having a socket 5 for the said squared portion 3 of the rod. A screw 6 is inserted through the side of said fork to engage the portion 3, whereby the rod is detachable from the universal joint assembly. The block 7 is inserted between the prongs of said fork and is held in place by a pivot pin 8, and another fork 9 is connected to this block by a similar pin 10, the two pins 8 and 10 being quite close together and at right angles to each other, whereby the two forks 4 and 9 and the block 7 constitute a single universal joint. The fork 9 has a short polygonal shank or end portion 11, and the socket 12 has a square bore portion 13 to fit said shank. A set screw 14 is inserted through the side of the socket to engage the shank 11, so that the socket is removable from the universal joint. Said socket has a hexagonal bore portion 15 to engage a nut or bolt head. A plurality of sockets is employed, having hexagonal cavities or bore portions of different sizes (for convenience only one socket is shown) whereby the wrench can be used in connection with bolts or nuts of different sizes.

In Figure 6 it will be seen that the fork 4 and the block 7 are the same as those previously described, but it will be seen that the second fork 16 is bifurcated at each end, instead of being bifurcated at one end only, like the fork 9 previously described, and with this construction the fork 16 receives a second block 17 which is secured thereto by a pivot pin 18 inserted therein. A third fork 19 is secured to the block by a pivot pin 20, the two pins 18 and 20 being quite close together and disposed at right angles to each other. With this con-

struction a double universal joint assembly is provided, so that the rod 1 of the wrench may extend more nearly parallel with the axis of the bolt or nut to be turned. The fork 19 has a square shank or engaging portion 21 to fit any one of the different sockets, such as the socket 9 previously described, whereby these sockets can be used interchangeably on either the single universal joint assembly or the double universal joint assembly, and whereby the two assemblies are adapted to be used interchangeably on one and the same rod 1 or other handle.

It will be seen that the opposite ends of the complete universal joint assembly are flat and coextensive with the full cross-sectional area of the cylindrical forks or body portions of the joints, and that one flat end has a socket in the center thereof for the end of the rod 1, while the other flat end has a larger socket therein to engage a nut or bolt head, assuming the removable socket piece to be a part of the complete assembly. Of course, when the removable socket is disconnected, then this end of the universal joint assembly terminates in a short square shank which fits any of the different socket pieces, in the manner explained.

As shown in Figures 1 and 2 the universal joint structure comprising the parts 4, 9 and 12 is cylindrical and is flat at each end and each end is of the maximum diameter of the cylindrical structure. One flat end has the socket 5 for the handle rod, and the other flat end has the socket 15 for the nut or bolt head.

What I claim as my invention is:

1. In a wrench, a cylindrical universal joint structure having flat transverse ends each of the full transverse or maximum cross-sectional area of the cylindrical structure, having transverse pivots the ends of which are flush with the cylindrical surface, so that the structure is substantially cylindrical for its full length, a polygonal socket in the center of one flat end to receive a handle rod, and a socket in the other flat end to receive a nut or the head of a bolt.

2. A structure as specified in claim 1, together with means including a set screw inserted transversely through one cylindric side of the joint to removably secure the handle rod in place.

3. In a wrench, the combination of a handle rod having a polygonal end portion, a cylindrical universal joint having one end provided with a socket for said polygonal end of the rod, a set screw inserted through the cylindrical side of the joint to engage said rod, the other end of the joint having a short polygonal shank, a socket piece removably fitting said shank, said socket piece being cylindrical and having flat ends, the joint with said piece thereon being substantially cylindrical for its full length, having transverse pivots the ends of which are flush with the cylindrical surface, and a set screw inserted through the side of said socket piece to engage said shank, substantially as shown and described.

4. In a wrench, the combination of a rod, a universal joint secured to said rod, a hollow interchangeable socket piece formed to receive a nut or bolt head and removably secured to said universal joint, so that a plurality of sockets of different sizes can be used one at a time and interchangeably in combination with and on the end of said universal joint, whereby the wrench is inoperative to turn a bolt or nut without a removable socket piece on the end thereof, and means to removably secure the socket in place, so that the socket must be removed to permit use of another socket, in combination with another universal joint adapted to be used interchangeably with said first mentioned universal joint, on the same rod, and said sockets being adapted to interchangeably fit the end of either universal joint.

PERCY YORK.