M. HARRISON.

SOCKET WRENCH.

APPLICATION FILED JAN. 20, 1919.

1,334,154. Patented Mar. 16, 1920.

Fig. 1

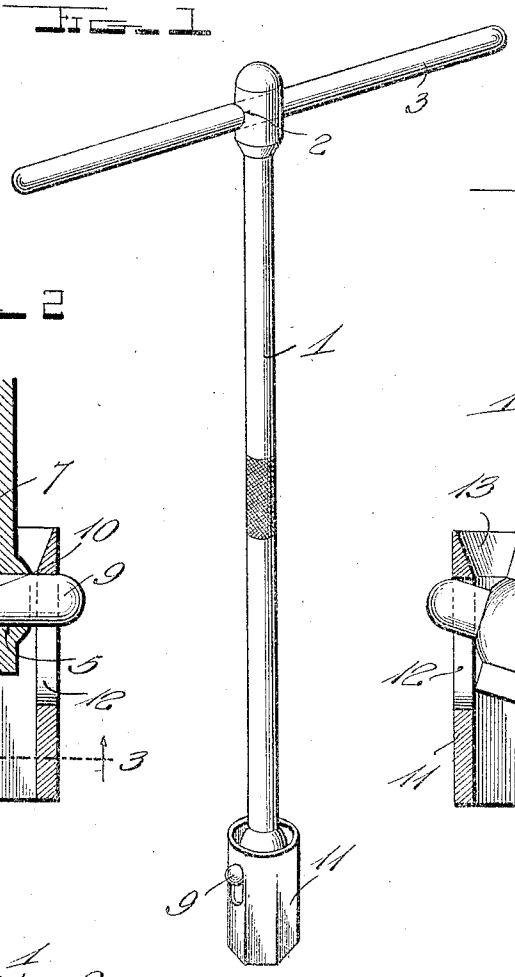


Fig. 4

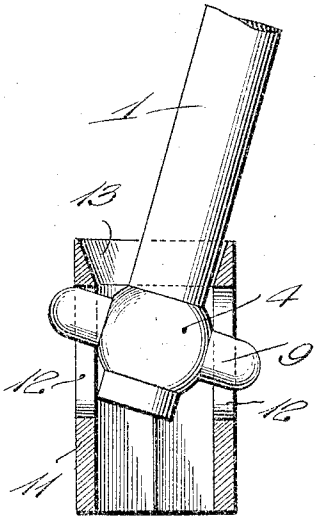
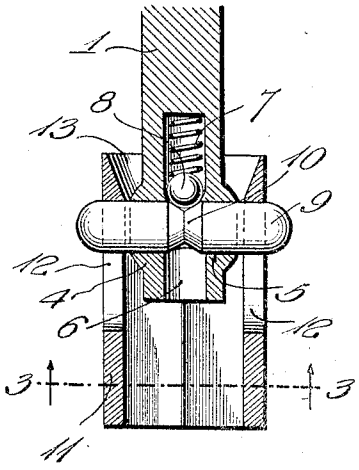


Fig. 2



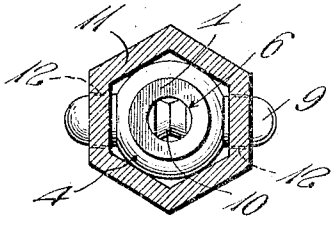


Fig. 3

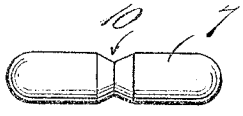


Fig. 5

Witness

Inventor

Mark Harrison

By A. B. Williamson & Co

Attorneys

UNITED STATES PATENT OFFICE.

MARK HARRISON, OF DENVER, COLORADO.

SOCKET-WRENCH.

1,334,154. Specification of Letters Patent. Patented Mar. 16, 1920.

Application filed January 20, 1919. Serial No. 272,042.

To all whom it may concern:

Be it known that I, MARK HARRISON, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Socket-Wrenches; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in socket wrenches.

One object of the invention is to provide an improved means whereby sockets of different sizes may be quickly and easily attached to and removed from the handle.

Another object is to provide a universal joint connection between the sockets and handle whereby the latter may be operated at an angle to the sockets.

A further object is to provide a wrench of this character which will be simple and inexpensive in construction, strong and durable in operation, and well adapted to the purpose for which it is designed.

With the foregoing and other objects in view the invention consists in the construction, combination and arrangement of parts herein described and claimed.

In the accompanying drawings:

Figure 1 is a perspective view of my improved wrench;

Fig. 2 is a central vertical longitudinal section of the wrench;

Fig. 3 is a cross sectional view taken on the plane indicated by the broken line 3—3 of Fig. 2;

Fig. 4 is a detail sectional view similar to Fig. 2 showing the position of the parts when the handle is operated at an angle to the socket; and

Fig. 5 is a detail side view of the cross pin by means of which the sockets are operatively and removably attached to the handle.

Referring more particularly to the drawings, 1 denotes the handle of my improved wrench which is preferably in the form of a straight metal rod of suitable size and length. One end of the handle is enlarged and has formed therein a transverse passage 2 with which is loosely and removably engaged a cross bar or hand grip 3. On the opposite end of the handle is also formed a substantially spherical enlargement or head 4 having a transverse passage 5. This enlarged end of the handle has also formed therein a longitudinal cavity 6 which extends inwardly a suitable distance from the transverse passage 5 and has seated in its inner end a coil spring 7 between which and the transverse passage 5 is a spherical detent or ball 8 a portion of which projects into the transverse passage 5 as shown. The detent 8 is held in operative position against the pressure of the spring 7 by upsetting or crimping the outer edges of the longitudinal cavity 6 where the same opens into or intersects the transverse passage 5. This upsetting of the edges of the passage 5 at the place indicated is effected by a suitable instrument inserted through the outer portion of the cavity 6 in the end of the handle.

Adapted to be inserted through the transverse passage 5 and to be removably held in position therein by the detent 8 is a cross pin 9 having therein midway between its ends an annular groove 10 which receives the detent 8. The engagement of the detent holds the cross pin 9 against casual disengagement or removal from the passage 5. The cross pin 9 is of sufficient length to permit the opposite end thereof to project a suitable distance beyond the sides of the head or enlargement 4 and the outer ends of the pin are rounded so that when the latter is pushed through the passage 5 the engagement of one of the rounded ends will force the detent 8 inwardly against the pressure of its spring until the groove 10 is opposite to the detent at which time the spring will force the detent outwardly and into yielding engagement with the groove 10 in the pin. The walls of the groove 10 are beveled so that the detent does not positively lock the pin and when sufficient pressure is applied to either end of the pin to overcome the pressure of the spring 7 the detent will be forced inwardly thus permitting the cross pin to be readily removed while at the same time the pin will be held against accidental removal in the use of the tool.

Any number of nut engaging or socket members of various sizes may be provided for use with the handle herein described, all of which are of substantially the same construction, therefore only one socket is shown in the drawing. The sockets consist of a tubular member 11, the outer portion of which is preferably of hexagonal shape for engagement to a similar shape nut, while the inner portion thereof is preferably cylindri-

cal. At diametrically opposite positions in the sides of the inner cylindrical portion of the sockets are formed alined longitudinally disposed slots 12 which when the socket is in place on the handle receive the projecting ends of the cross pin 9 which thus loosely attach the socket to the handle. The wall of the passage at the inner end of the cylindrical portion of the socket is beveled as at 13. This construction and the slots 12 in the walls of the socket with which the projecting ends of the pin 9 are loosely engaged provide for a rocking movement of the handle in all directions or a universal joint connection between the handle and the socket so that when necessary the handle may be operated at an angle to the socket.

By providing the detachable connection between the cross pin 9 and the end of the handle as herein shown and described the pin may be readily disengaged from the handle to permit quick and easy removal and replacing of the interchangeable socket members of the wrench. At the same time a strong, durable and reliable connection between these parts is provided for effecting the turning of the socket by the handle when the latter is in line with the socket or at an angle thereto.

I claim:

1. A wrench comprising a handle member having on one end an enlarged substantially cylindrical head provided with a transverse passage and having a longitudinal cavity reduced in size at its point of intersection with the inner side of the transverse passage, a spring projected spherical detent arranged in the inner end of said cavity and held in operative position therein by the reduced portion of the cavity, a socket member having therein slots, a cross pin detachably engaged with the transverse passage in said handle member and having its projecting end loosely engaged with the slots in said socket member, said cross pin having therein a beveled circumferential groove to receive said spring projected detent whereby said pin is operatively held in place.

2. A wrench comprising a handle having on one end an enlarged substantially cylindrical head provided with a transverse passage and having a longitudinal cavity, a spring projected detent arranged in the inner end of said cavity, means for operatively holding said detent in said cavity, a socket member having a central passage extending entirely therethrough and shaped at one end to engage a nut and having the inner walls of its inner end beveled or flared outwardly, said socket member also having therein oppositely disposed slots, a cross pin detachably engaged with the transverse passage in said handle member and having its projecting end loosely engaged with the slots in said socket member, said cross pin having therein a circumferential V shaped groove adapted to receive the spring projected detent in the cavity of the handle member whereby said pin is operatively held in place but may be readily removed to permit the disengagement from the socket member from the handle member.

3. A wrench comprising a handle member having in one end a transverse passage and a longitudinal cavity, a spring projected detent held in operative position in the inner end of said cavity, a socket member having therein oppositely disposed longitudinal slots, a cross pin having beveled or rounded ends and a centrally disposed circumferential V shaped groove, said pin being adapted to be removably engaged with the transverse passage in said member and to be operatively held in position by said spring projected detent, the ends of said pin engaging the slots in said socket member whereby a universal connection is formed between said socket member and handle.

In testimony whereof I have hereunto set my hand.

MARK HARRISON.