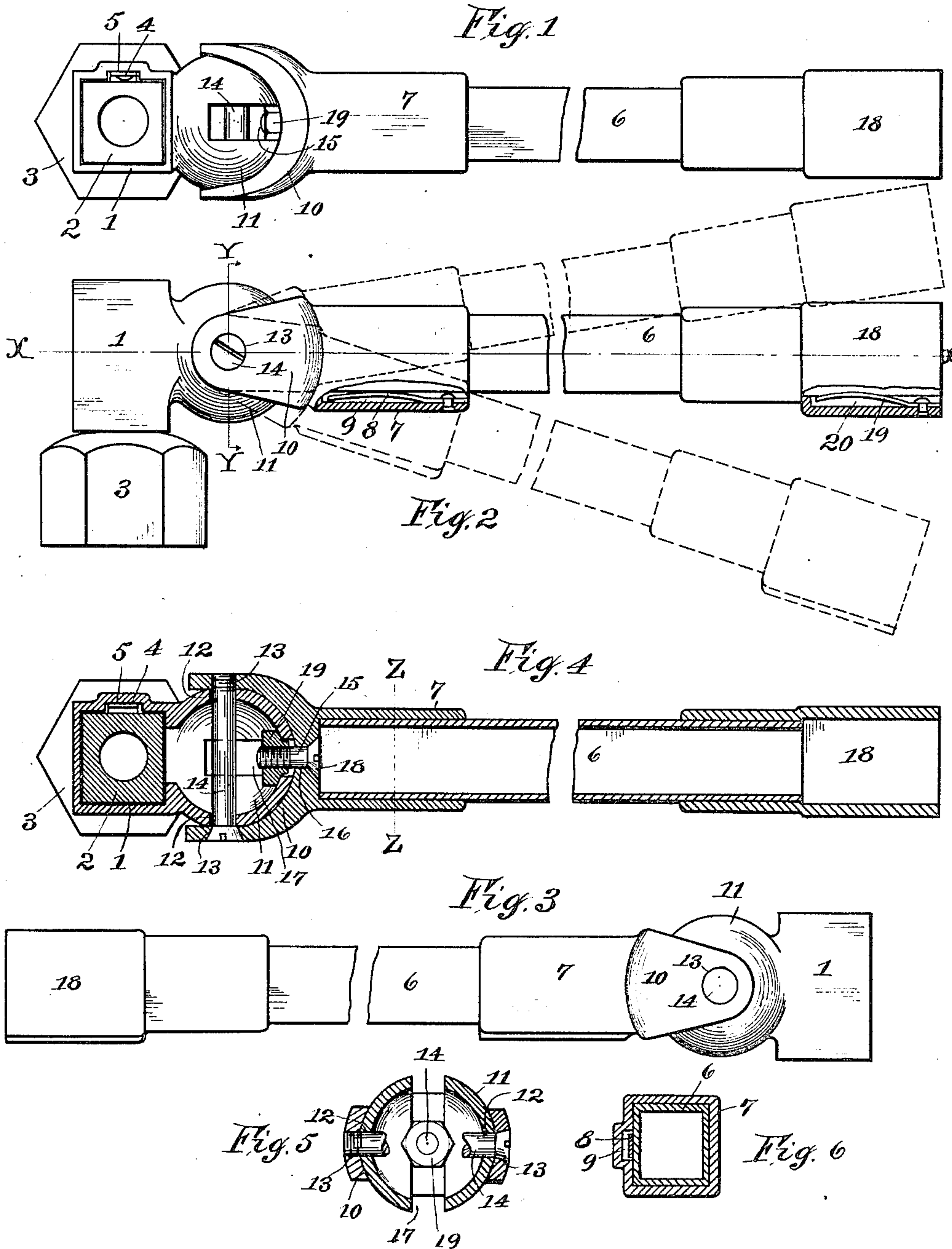


952,435.

Patented Mar. 15, 1910.

2 SHEETS—SHEET 1.



WITNESSES:  
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SOCKET WRENCH.

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952,435.

Patented Mar. 15, 1910.

2 SHEETS—SHEET 2.

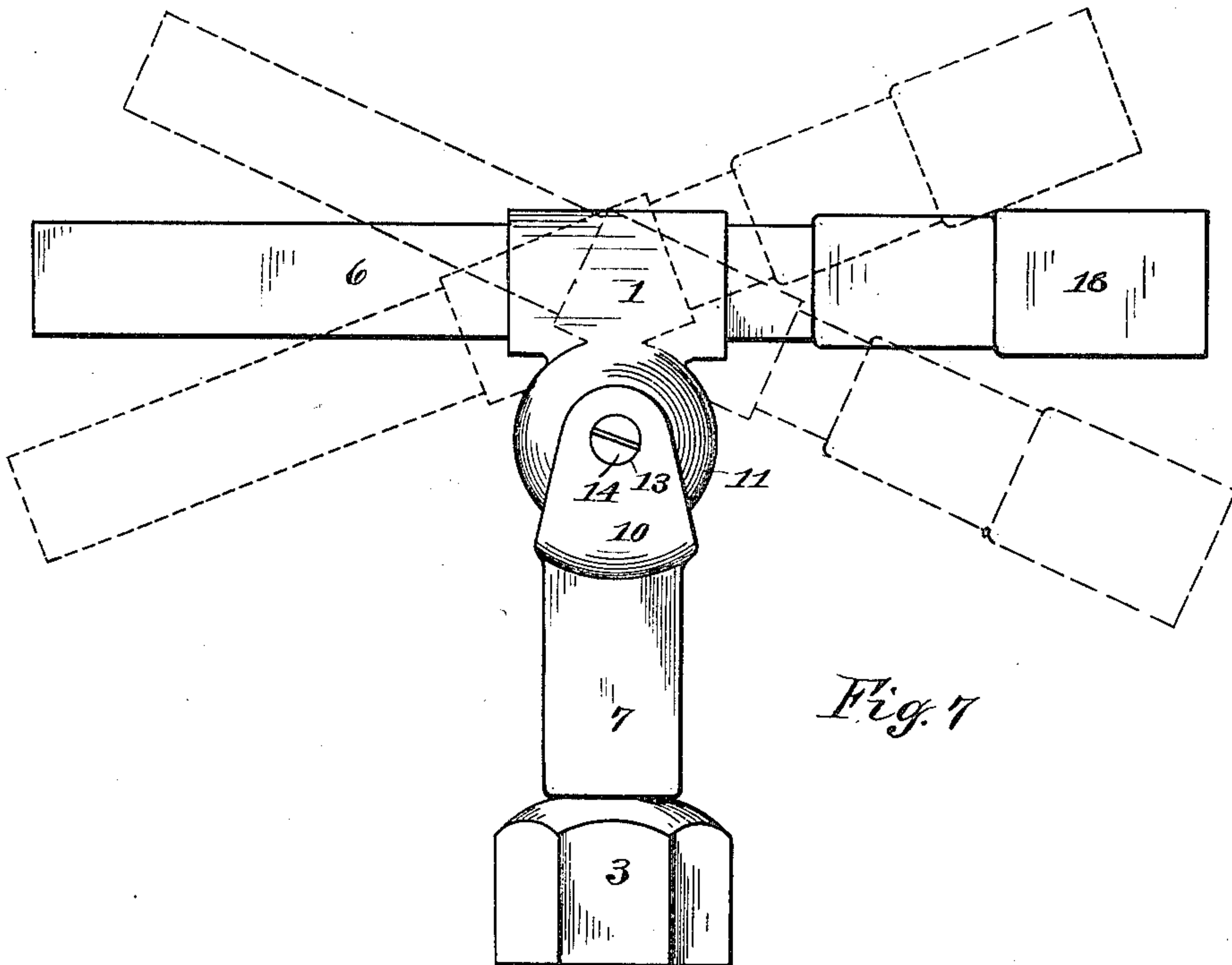


Fig. 7

Fig. 8

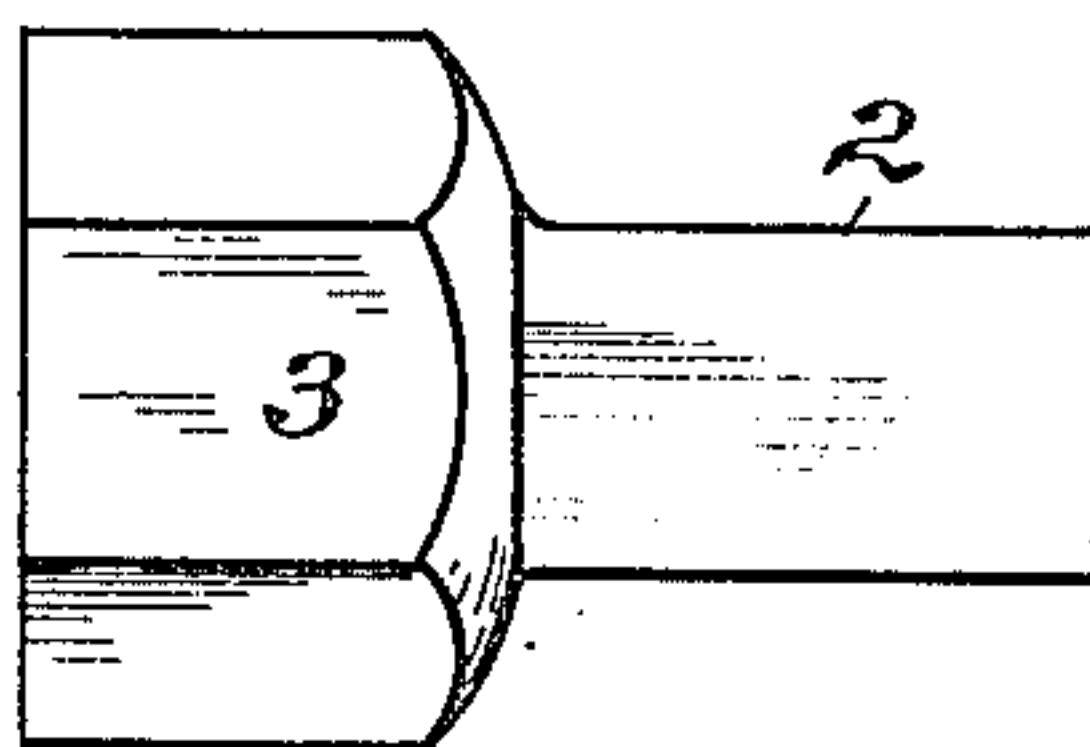
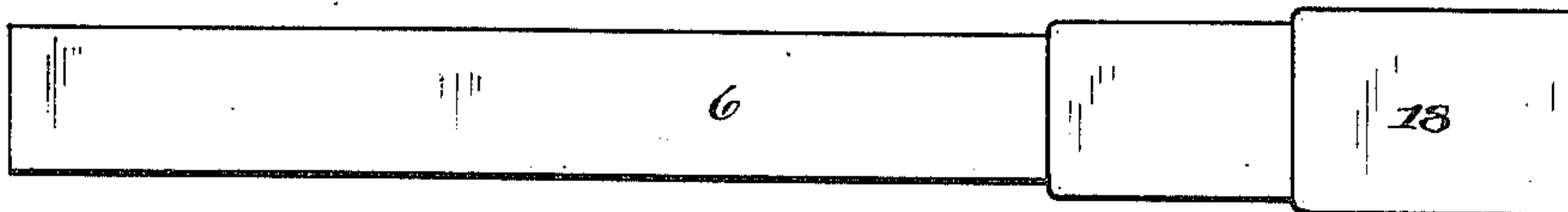


Fig. 9

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# UNITED STATES PATENT OFFICE.

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## SOCKET-WRENCH.

952,435.

Specification of Letters Patent. Patented Mar. 15, 1910.

Application filed March 20, 1909. Serial No. 484,613.

*To all whom it may concern:*

Be it known that I, CHARLES MILLER, a citizen of the United States, and resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Socket-Wrenches, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of socket-wrenches embodying a holder adapted to receive a stem provided with a socket designed to be applied to a nut or other similar shaped object required to be turned, said stem being detachable so as to permit the use of stems having different sized sockets, and the holder having a handle or bar connected to it for turning the same.

One of the objects of the present invention is to provide a wrench of the aforesaid character which will permit the handle to be set at different angles in relation to the holder in order that the handle may clear obstacles which might otherwise tend to interfere with its operation in some instances.

Another object of the invention is to produce a wrench having interchangeable parts whereby its efficiency will be increased.

Other objects of the invention will be apparent from the novel arrangement and combination of the component parts of the socket-wrench hereinafter fully described and set forth in the claims.

In the accompanying drawings Figure 1 is a plan view of the socket-wrench constructed in accordance with my invention; Fig. 2 is a side view showing by dotted lines the adaptability of the handle to be swung to various positions; Fig. 3 shows the side of the wrench viewed reverse to Fig. 2; Fig. 4 is a longitudinal section on the line  $x-x$  in Fig. 2; Fig. 5 is a transverse section on the line  $y-y$  in Fig. 2; Fig. 6 is a transverse section on the line  $z-z$  in Fig. 4; Fig. 7 is a side view of the wrench showing parts interchanged; Fig. 8 is a detached side view of the operating handle or bar; and Fig. 9 is a detached side view of the stem which is formed with the nut-socket.

Like characters of reference indicate like parts in the several views of the drawings.

My improved wrench comprises a holder —1— which consists of a cast-metal sleeve preferably formed square in cross-section

and adapted to receive a removable stem —2— formed with the well known socket —3— designed to be applied to a nut or similar shaped object required to be turned. This stem may be retained in the holder —1— by any suitable means, but preferably by an elongated spring-plate —4— secured in a longitudinal channel —5— provided in the holder, said plate being designed to secure the stem by frictional engagement therewith.

This wrench also comprises a handle —6— which essentially has a pivotal connection with the holder —1—. Said handle is hollow and is formed square in cross-section and may be composed of steel or any other metal and is provided on its attaching end with a cast-metal sleeve —7— of corresponding shape in cross section, said handle being held detachably in the sleeve by frictional engagement with a spring-plate —8— suitably secured in a longitudinal channel —9— within the sleeve as shown in Figs. 2 and 6. This sleeve is formed with a socket —10— which receives a ball —11— formed integral with the holder or sleeve —1—. Said ball is hollow and is provided with oppositely disposed openings —12— which are slightly elongated and coincide with circular apertures —13— provided at opposite sides of the socket —10—, through which openings and apertures passes a pivot pin —14— whereby the aforesaid handle may be swung into various angles in relation to the holder —1—. This pin is preferably of the form of a screw, therefore one of the apertures —13— is correspondingly threaded and the other aperture provided with a countersink for the reception of the screw-head as clearly illustrated in Fig. 4. The aforesaid apertures —12— are elongated for the purpose of allowing the ball —11— to be drawn into frictional contact with the socket —10— so as to retain the handle in the desired position. To effect this result I provide a bolt —15— which passes through a central opening —16— in the socket, and through a coinciding slot —17— in the ball, said bolt being formed with a screw-head —18— seated in a countersink of the opening. A nut —19— on the protruding end of the bolt is formed with a convex inner face to conform to the inner surface of the ball. It is obvious that by tightening the said nut the



ball will be firmly drawn into the socket for the purpose stated. The aforesaid slot —17— in the ball accommodates the bolt to permit the said ball to turn in its socket incident to the swinging of the handle as indicated. It will be observed that by providing the two members —1—7— of the same internal dimensions, the stem —2— and handle —6— may be interchangeably applied thereto as shown in Fig. 7. This interchangeability of parts permits more extended use of the wrench.

I prefer to provide the free end of the handle —6— with a permanently attached sleeve —18— having a friction-plate —19— secured in an internal longitudinal channel —20— in said sleeve as shown in Figs. 2 and 4. By providing this sleeve —18— an additional section may be applied to the handle if required.

What I claim as my invention is:—

1. A wrench of the class specified comprising a holder having a detachable nut-socket member, and an operating handle pivotally and detachably connected to said holder, said nut-socket member and handle being interchangeable in their attachments as set forth.

2. A wrench of the class specified comprising a holder provided with a detachable nut-socket member and formed with a hollow slotted ball, an operating handle provided with a socket member receiving said ball and having a loose pivotal connection therewith, and the socket member provided with an opening coinciding with the slot in the ball, and a bolt passing through the opening and slot and provided with means

shaped to conform to the interior of the ball for the purpose set forth.

3. A wrench of the class specified comprising a holder consisting of a sleeve for a nut-socket member, and formed with a hollow slotted ball, a handle provided on one end with a detachable sleeve formed with a socket receiving said ball, and means passing through the socket and into the ball for retaining said ball and socket in frictional connection as set forth.

4. A socket-wrench comprising a holder, a nut-socket member secured removably in the holder, a handle, a pivotal coupling for the handle and holder, said handle being detachable, and the nut-socket member and handle interchangeable in their connections as set forth and shown.

5. A socket-wrench comprising a holder formed with a hollow ball provided with oppositely disposed apertures, a nut-socket member formed with a stem secured detachably in said holder, a handle provided with a socket having apertures coinciding with the apertures of the ball, a pivot-pin fitted to the apertures of the socket and passing loosely through the apertures of the ball, whereby the handle is permitted to swing to different angles in relation to the aforesaid holder, and means for drawing said ball and its socket into frictional contact to sustain the handle in the required position as set forth.

CHARLES MILLER.

Witnesses:

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M. LAASS.