

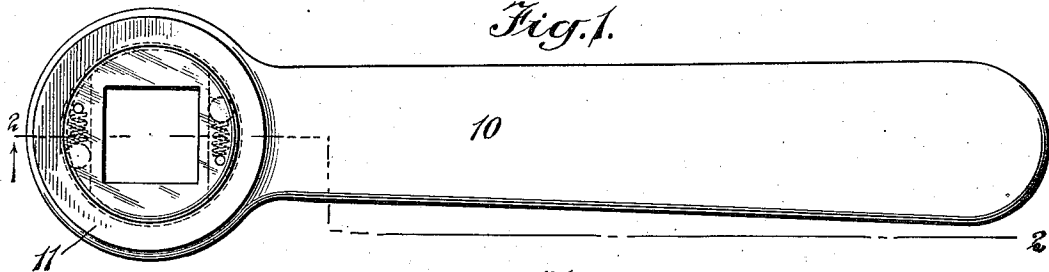
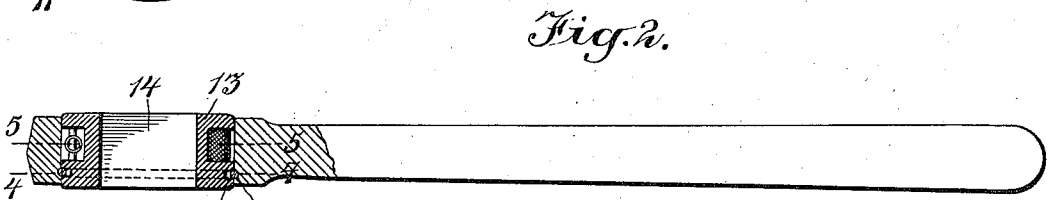
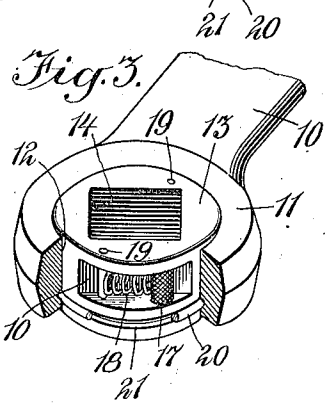
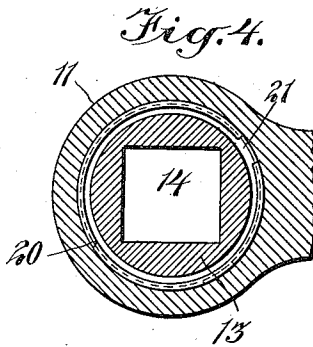
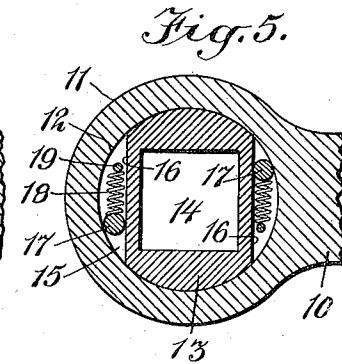
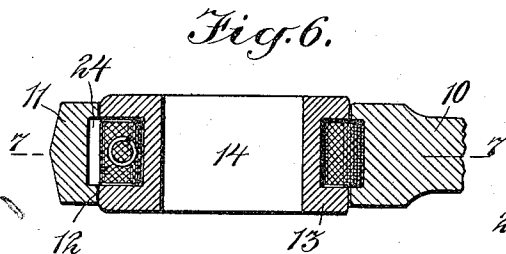
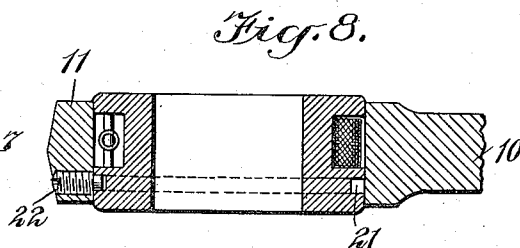
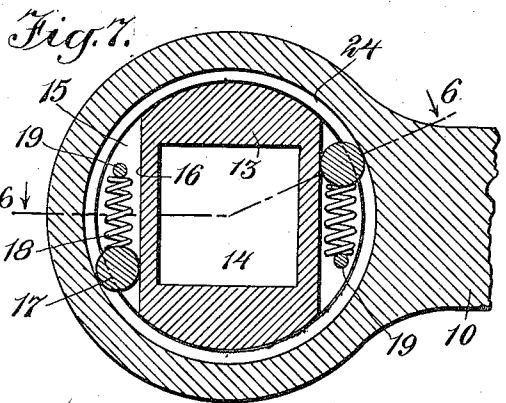
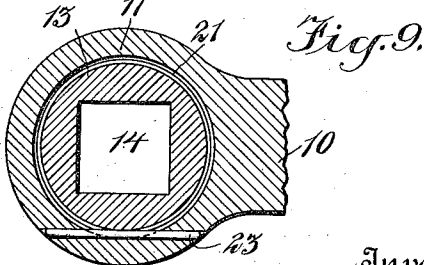
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WRENCH.

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1,242,201.

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WRENCH.

1,242,201.

Specification of Letters Patent.

Patented Oct. 9, 1917.

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To all whom it may concern:

Be it known that I, CHARLES G. KELLER, a citizen of the United States, and a resident of Poughkeepsie, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to certain improvements in wrenches of that type in which the handle is provided with a separate socket head which may be gripped and turned by the handle upon a movement of the latter in one direction and permitted to remain at rest when the handle is moved in the reverse direction.

The main objects of my invention are to provide a wrench of this character which has the size, appearance, thickness and weight of the common one-piece socket wrench, which is compact in form, and which presents symmetrical faces at opposite ends of a single socket of uniform bore.

In my improved construction, the socket may be placed over the nut, tool or other part to be turned with either face down and may be easily lifted off, rotated about the axis of the handle through 180° and replaced, one face being down for turning the part in one direction and the other face being down for turning it in the reverse direction.

The head is of approximately the same thickness as the adjacent encircling portion of the handle and the parallel faces are thus substantially flush with the parallel faces of said handle portion so that the thickness of the wrench is reduced to the minimum. The portion of the head which directly receives the part to be turned is entirely encircled and reinforced by the handle so that the external diameter of the head need not be very much larger than the socket and the minimum amount of metal necessary for the desired strength may be employed.

In the accompanying drawings, I have illustrated certain embodiments of my invention and it will be evident that various other forms may be designed within the spirit of my invention without departing from the scope of the appended claims. In these drawings, to which reference is to be had and in which similar reference characters indicate corresponding parts in the several views,

Figure 1 is a face view of a wrench constructed in accordance with my invention, certain of the operating parts being shown in dotted lines;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view with a portion of the head encircling part broken away;

Figs. 4 and 5 are transverse sections on the lines 4—4 and 5—5, respectively, of Fig. 2;

Fig. 6 is a longitudinal section similar to a portion of Fig. 2, but showing a slightly different construction, said section being taken on the line 6—6 of Fig. 7;

Fig. 7 is a section on the line 7—7 of Fig. 6.

Fig. 8 is a section similar to Figs. 2 and 6 but showing a different form of retaining means; and

Fig. 9 is a section similar to Fig. 4, but showing a still further form of retaining means.

In the specific construction shown in Figs. 1 to 5, inclusive, my improved wrench includes a handle member 10 terminating at one end in a collar or socket receiving part 11. This part may be of approximately the same thickness as the body of the handle, or may, as shown, be slightly thicker. This socket encircling portion has a cylindrical aperture extending therethrough and presenting an inner cylindrical face 12.

Within this circular aperture is a head 13 of a length substantially equal to the thickness of the part 11 and presenting opposed, substantially parallel faces which are approximately flush with the opposed faces of the head receiving part 11. In actual practice, the head is made slightly thicker than the part 11 as is illustrated. The head has a socket 14 extending therethrough from one face to the other and of substantially uniform size so that the wrench may be placed over a nut, tool or other part with either face down and with said part extending into either end of the socket.

In the periphery of the head 13, I provide one or more recesses 15 which are preferably formed by machining out a segment shaped portion of the head between, and spaced from, the ends of the head so as to leave the end faces circular in form and to make the inner surface 16 of the recess a chord of the circle. The opposed walls of the recess are thus formed by the straight surface 16 and the cylindrical surface 12.

Within each recess, I place a roller 17 of a length substantially equal to the height of the recess and of a diameter slightly less than the maximum depth of the recess at the center of the latter. Each roller may be of hardened, tempered steel and, to permit it to more effectively grip the converging recess walls, it is preferably knurled or roughened. For insuring the proper retention of each roller in the desired end of its recess, each recess is provided with a small coil spring seating against the roller and against any suitable stop as, for instance, a pin 19.

Any desired number of these recesses and the corresponding rollers may be employed, although I find that two at diametrically opposite points are amply sufficient to give the desired effect. It will be noted that the recesses and their rollers and springs are entirely concealed from view within the head receiving part 11 which also acts to hold the springs and rollers in place. Any tendency of the handle to turn clockwise from the position shown in Fig. 5 and while the socket head is stationary, will move the rollers against the springs and permit the free turning of the handle. A movement of the handle in the opposite direction will wedge the rollers between the converging walls at the ends of their recesses and prevent any further movement of the handle in that direction without a corresponding and equivalent movement of the head itself.

The head is shown as having a socket or hole, square in cross section, although it will be evident that the shape of this socket will vary with the character of the tool, nut or other part for which the wrench is designed. It is only essential that the socket, for ordinary purposes, be non-circular in cross section so as to prevent a relative rotation of the head and the part to be turned.

As an important feature of my invention, I make the head of a thickness only approximately the same as the thickness of the head receiving part of the handle. For holding the head in place within the part 11, preventing the endwise movement of the head in respect to the head receiving part, and permitting the free relative rotation of the head and handle in one direction, various forms of retaining means may be employed. In Figs. 2, 3 and 4, I have shown the peripheral surface of the head 13 and the inner cylindrical surface 12 of the head receiving part 11 provided with opposed similar grooves. One of these grooves, preferably the groove 21, in the periphery of the head 13 is of a depth at least equal to its width and may entirely receive a spring ring 20. After the ring has been placed in this groove and the rollers 17 and springs 18 have been placed in proper positions in their recesses, the head 13 may be moved

endwise into the head receiving part 11 until the spring ring 20 comes opposite to the groove in the cylindrical surface 12. The ring will then expand outwardly into the last mentioned groove and will occupy a position partly within the latter groove and lie partly within each member so as to positively prevent any further endwise movement of the head 13 in either direction but permit a free rotation. This retaining means permanently connects the parts and does not permit of a separation of them after they have once been assembled. Thus, the purchaser cannot tamper with the mechanism or take the tool apart. In some constructions it may be desirable to facilitate the separation of the parts, in which case a different form of retaining means may be employed.

As shown in Fig. 8, the head receiving member 11, instead of having a groove in its cylindrical surface, has a radially extending, threaded aperture to receive a threaded pin 22. This may be screwed in until its inner end enters a groove 21 and with the outer end of the pin flush or slightly below the outer surface of the part receiving the pin. This pin serves the same purpose as the spring ring 20 above described or may be readily removed when it is desired to separate the parts.

In Fig. 9, I have shown a further form of retaining means which may be removed to permit separation of the parts. This form shown in Fig. 9 has the advantage of slightly less cost as no threading of any parts is necessary. This retaining means is in the form of a pin 23 disposed in a hole running approximately tangential to, but slightly intersecting, the cylindrical inner surface 12 of the head receiving part. The hole is so positioned that when the head 13 is in proper position, the pin may be driven in and have its central portion lie within the groove 21 of the head. This pin fits friction-tight and is of such length that in case it should begin to work loose, its projecting end will be immediately noticed and the pin may be driven back into place.

A still further form of retaining means is shown in Figs. 6 and 7. In this form, the rollers serve not only to prevent relative rotation of the head and handle in one direction, but also serve to prevent the relative axial movement of the parts. This construction differs from that shown in Figs. 1 to 5, inclusive, merely in that its groove 24 in the cylindrical surface 12 is centrally disposed in respect to the opposite parallel faces and is of a length substantially equal to the length of the rollers instead of being of narrower width and between the rollers and one end surface.

In assembling the parts, the rollers and springs are placed in the recesses and the

rollers forced toward the center portions of their recesses and against the action of their respective springs so that the rollers do not project beyond the periphery of the head.

5 The head is then moved axially into the head receiving part and when it is properly centered the rollers may move outwardly into the groove 24 and thus project across the thin cylindrical space between the two concentric members and positively prevent relative axial movement. In this form, the parts can not be separated after once being assembled if the head fit closely within the annular part 11, but if there is a slight amount of free play, a pair of thin sheet metal strips or tools may be inserted into the thin crack between the parts and used to force the rollers back against their springs until they are entirely within their respective recesses and an endwise movement of the head is possible.

It will be noted that my improved device is symmetrical and compact and that the minimum amount of metal and weight is employed for the required size and strength of the wrench. The ratchet rollers may be of cylindrical or ball type, although preferably the former, and operate in only one direction, but the wrench being symmetrical and having the single socket opening extending all the way through, may have either end of the socket placed over the nut, tool or other part and the latter may be rotated in either direction, depending upon which side up the wrench is placed.

The wrench is comparatively inexpensive to manufacture as all of the surfaces are either cylindrical ones which may be brought to the desired measurement in a lathe, or are straight ones, such as the inner surface 16 of the recesses, and these may be readily machined.

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

1. A socket wrench including a handle member having a cylindrical opening therethrough terminating at opposed faces, a cylindrical socket member of uniform diameter throughout its length disposed within said opening and having opposed parallel end faces approximately flush with the faces of said handle member, an annular groove in the periphery thereof adjacent to one face, and a non-circular socket extending axially through said socket member from one face to the other, a portion of the periphery of said socket member between and spaced from the end faces thereof and at one side of said annular groove being cut away to form a recess having a face converging toward the cylindrical inner face of said opening, a roller in said recess, means tending to hold said roller against said converging faces, and a member for

holding said socket member against axial movement, said member being carried by said handle member intermediate of the faces thereof and projecting into said annular groove.

2. A socket wrench, including a handle member, a socket head of substantially the same thickness, said head being formed of a single piece of metal, circular in cross-section at each end and disposed within a cylindrical aperture in said handle member, the periphery thereof intermediate of its ends having a recess, a roller within said recess and serving to prevent relative rotary movement of the handle and head in one direction and permit relative rotary movement in the opposite direction, and a member carried by said handle member intermediate of the opposed faces of the latter and engaging with the periphery of said head intermediate of one end of the latter and said recess to prevent the endwise movement of said head out of the aperture in the handle member.

3. A socket wrench, including a handle having an aperture therethrough cylindrical in form and of uniform cross section throughout its length, a head within said aperture and of cylindrical form and uniform cross section throughout its length, with its periphery having an annular groove and a recess therein, a roller within said recess for preventing relative rotation of said head and said handle in one direction, and a member carried by said handle member and extending into said annular groove to prevent relative endwise movement of said head and handle.

4. A wrench including a handle member having a one-piece collar integral therewith at one end thereof, a one-way-rotatable socket member encircled by said collar and of a length substantially equal to the thickness of said collar and having its periphery cylindrical and of uniform radius throughout its length with two diametrically opposite recesses therein, spaced from the ends of said socket member to leave unbroken cylindrical end portions of said socket member for bearing engagement with the end portions of the interior of said collar and forming integral end walls for said recesses, said recesses having parallel inner surfaces each along a chord of the circle of said periphery and two rollers at diametrically opposite points intermediate said parallel surfaces and the inner surface of said collar for preventing relative rotation of said socket member and collar in one direction.

5. A wrench including a handle member having a continuous integral collar at one end thereof, a socket member encircled by said collar and formed of a single piece of metal, said socket member having its end portions presenting unbroken cylindrical

surfaces for bearing engagement with the inner cylindrical surface of said collar and said socket member having recesses in its periphery and rollers within said recesses
5 engaging with the inner periphery of said collar and concealed from view and held against endwise movement by the unbroken

cylindrical, integral end portions of said socket member.

Signed at Poughkeepsie, in the county of 10 Dutchess and State of New York, this 10th day of April, A. D. 1917.

CHARLES G. KELLER.