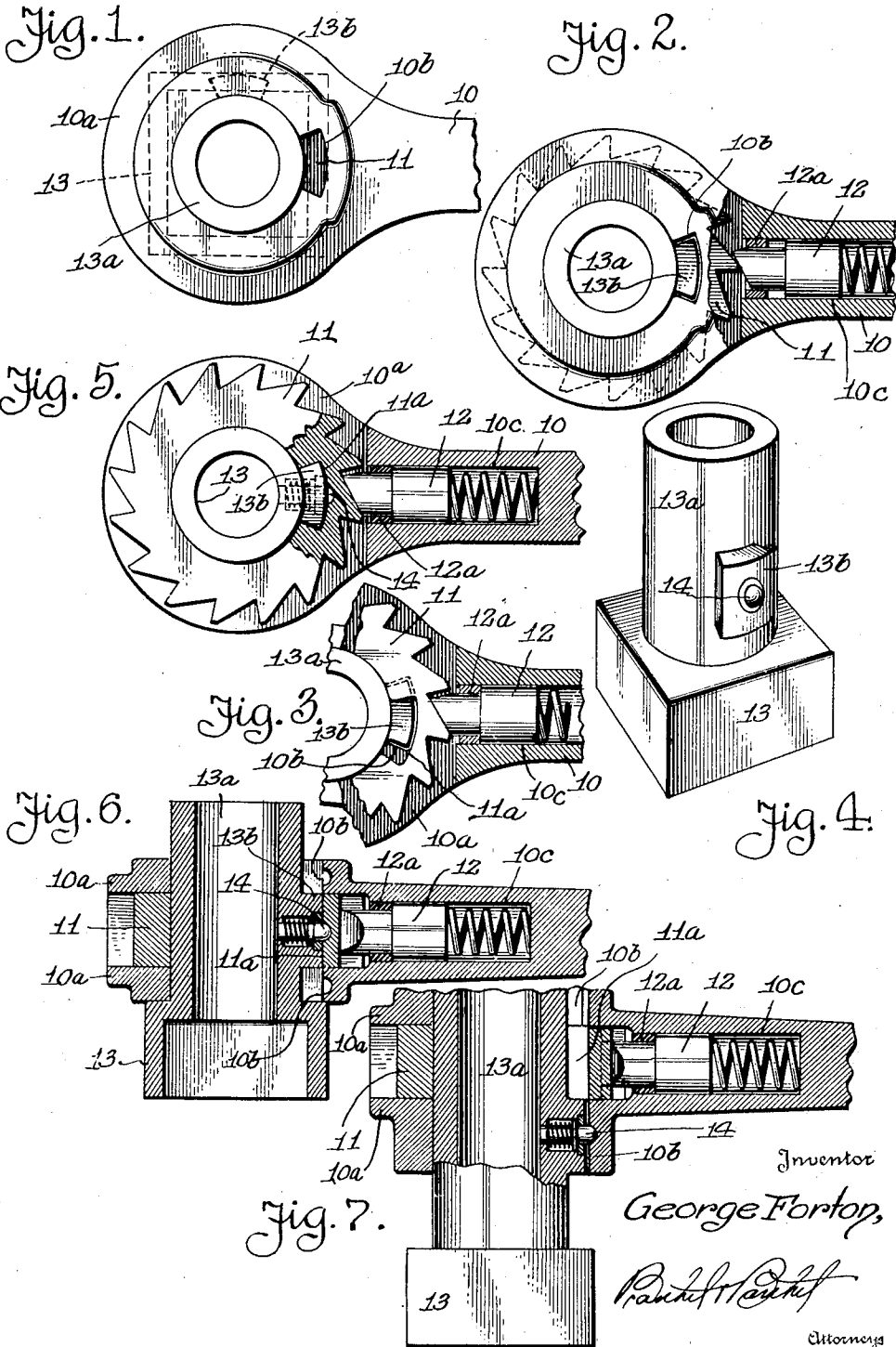


1,347,691.

Patented July 27, 1920.



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UNITED STATES PATENT OFFICE.

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WRENCH.

1,347,691.

Specification of Letters Patent.

Patented July 27, 1920.

Application filed January 13, 1920. Serial No. 351,118.

To all whom it may concern:

Be it known that I, GEORGE FORTON, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Wrenches, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in wrenches and pertains more particularly to wrenches of the socket type wherein the power is applied by the use of a handle projecting at approximate right angles to the axis of the socket.

While the invention is not limited to its use as a socket wrench, it is especially adapted for general use where the conditions require operations of this type and for this reason the invention is illustrated and described in connection with this form. For instance, one of the uses for which the present invention is particularly adapted is under conditions where the head of a bolt is located at an inconvenient position and yet must be held while the nut is being positioned on the other side; or the conditions may be such as to require the threading of the nut by rotation of the bolt with the head located at such inconvenient point; or the nut may be at an inconvenient point and it be essential that the threading action be by movement rotatively of the nut.

The present invention is designed to provide a wrench capable of meeting conditions of this type and at the same time provide a construction which is simple and efficient in operation, durable in construction, and which can be manufactured at a relatively low cost.

To these and other ends, therefore, the nature of which will be understood as the invention is hereinafter disclosed said invention consists in the improved construction and combination of parts, hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the accompanying drawings, in which several forms are illustrated and in which similar reference characters indicate similar parts in each of the views,

Figure 1 is a plan view of a simple embodiment of the present invention; a portion of the handle being omitted;

Fig. 2 is a similar view, parts being shown

in section, and parts being in a different position from that shown in Fig. 1;

Fig. 3 is a view partly in section and partly in elevation of the structure of Fig. 2 with the parts in a different position;

Fig. 4 is a detail view of a modified form of the socket portion of the wrench which may be employed;

Fig. 5 is a view partly in plan and partly in section of a modified arrangement of wrench;

Figs. 6 and 7 are views of various modifications, which may be employed.

The wrench is designed more particularly as of the ratchet type, capable of ratcheting in one direction or the other and at the same time capable of being used as a wrench held against ratchet action. This is provided, in simple form, by a handle member 10, a ratchet wheel 11, a spring pressed pawl 12 and a socket member 13, these members having relative configurations which enables the wrench to be readily assembled in the different relations and in such manner as to permit these operations to be had.

Member 10 is formed with an enlarged head of the bifurcated type the two parts being indicated at 10^a, these being spaced apart a distance to receive the ratchet member 11 which is simply entered into the space between the portions 10^a. Portions 10^a are formed with a central opening of a size to loosely fit the shank 13^a of the socket member and the ratchet wheel is provided with a similar opening, these openings being alined as the socket portion and the shank portion of the socket are passed there-through. Member 10 is provided with a recessed head 10^e into which the pawl 12 and its supporting spring is located. If desired, a suitable collar 12^a may be inserted to limit the outward movement of the pawl.

With the ratchet wheel in position to provide the alinement of its opening with the openings of portions 10^a, the shank of the socket can be readily entered, but in order to maintain the socket in its position, it is essential that means be provided for maintaining the socket against longitudinal movement sufficient to permit the ratchet to be displaced from a position where its opening is in alinement with the opening of the portion 10^a.

In the simple form of the present invention this means is in the form of a lug 13^b carried by the shank of the socket, this lug

projecting outwardly from the periphery of the shank. To permit this lug to pass to position, the portions 10^a are provided with recesses 10^b of substantially the contour of a cross section of the lug and which open to the openings of portions 10^a, the ratchet wheel being provided with a similar recess 11^a in which the lug is located when the socket is in its position for operation.

10 In this particular form, it is preferred that recess 11^a be so positioned relative to the teeth of the ratchet wheel that when the recess 11^a is in alinement with recesses 10^b, the ratchet will be angularly displaced relative to pawl 12, as shown for instance, in Fig. 2. With the parts in this position, it will be readily understood that the shank of the socket member can be passed through the alined openings of member 10 and ratchet 11, and that lug 13^b can readily pass through one of the openings 10^b into the opening 11^a, thus placing the lug in the plane of the ratchet member 11. As the lug has a length not greater than the thickness of the ratchet member, it will be readily understood that if, when the parts are thus assembled, the ratchet member be shifted angularly so as to provide for the usual tooth engagement with the pawl 12, the positioned lug 13^b will be out of alinement with either of the openings 10^b. As the normal operation of a wrench practically locates the teeth in proper relation to pawl 12, as shown, for instance, in Fig. 3, it will be readily understood that the usual ratcheting action can be had without liability of the parts being disassembled through the dropping out of the socket member from the remaining structure, since at the particular point of time when lug 13^b is in alinement with the opening 10^b, the ratchet wheel is moving and little liability is had of such dropping out, especially since the socket is in engagement with the work.

45 When it is desired to disassemble the structure, it is necessary only to shift the ratchet wheel angularly a distance sufficient to bring the lug 13^b into alinement with the proper recess 10^b, whereupon the socket can be withdrawn, this ratchet wheel movement being possible by manipulating the socket member itself.

Obviously, the presence of a recess 10^b in each of the portions 10^a, permits the socket member to be entered from either side, so that it is possible to provide the ratcheting operation in either direction, the change required being to shift the socket member from one side to the other of member 10.

60 To permit use of the wrench without ratcheting, it is necessary only to insert the shank of the socket portion a distance sufficient to enter lug 13^b into either of the openings 10^b without having shifted the ratchet member, the result being that the

advance end of the lug will rest upon the face of the ratchet wheel and thus prevent inward travel; as the socket portion is in engagement with the work at the time, it will be readily understood that in use the combination can thus be employed either for the purpose of holding the bolt head stationary or be used to rotate the head, the lug and recess 10^b providing the drive connection between member 10 and the socket. Should it be desired to shift to this position while the socket is in engagement with the ratchet wheel, it is necessary only to shift the latter until the lug is brought into alinement with the proper opening 10^b and the socket member then be withdrawn a distance sufficient to clear the ratchet member whereupon the latter will move back to position under the action of the pawl; thus setting the parts in desired relation.

Where it is desirable to provide such fixed relation at frequent intervals and to retain the socket member in such position, it may be desirable to employ means for maintaining the socket member against longitudinal movement in such position. This result can be obtained by employing a small spring detent 14 in lug 13^b, this recess being adapted to enter a complementary recess of member 10, as shown, for instance in Fig. 7. This detent is preferably not of sufficient power to provide the drive relation between handle member 10 and socket member, that being provided by lug 13^b, but is normally of such type as to maintain the socket member against longitudinal movement, especially as it is generally required only to sustain the socket member from falling out of its position.

And, if desired, the arrangement may be such that the detent 14 can be made applicable in connection with ratchet wheel 11, as shown for instance, in Fig. 6, and where this is provided, it is possible to shift the position of recess 11^a so as to permit it to be in alinement with recesses 10^b when the ratchet teeth are in position shown in Fig. 3, this being an alternative arrangement and made possible by reason of the ability of the detent to prevent the socket member from moving longitudinally.

As will be understood, the arrangement is such as to permit of the use of but few parts, each of strong and substantial configuration, readily assembled, easily shifted from one position to another to meet the various conditions, and which is capable of use under all of the conditions, which the more complicated constructions are designed to meet. Obviously, the simplicity of the structure permits of its being manufactured at a comparatively small cost, there being no necessity for material assembling operations for securing the parts fixedly together, etc., the wrench itself being designed to permit of

its being practically totally disassembled, the only portion which is not removable being the pawl structure 12, and the detent structure when the latter is used.

5 As will be understood the work engagement end of member 13 may be of any desired configuration, the socket form being simply illustrative.

While I have herein shown and described 10 different ways in which the general invention herein disclosed may be carried into effect, it will readily be understood that changes and modifications therein may be found desirable or essential in meeting the 15 exigencies of use, and I desire to be understood as reserving the rights to make any and all such changes or modifications as may be found desirable or necessary, in so far as the same may fall within the spirit and 20 scope of the invention as expressed in the accompanying claims when broadly construed.

What I claim is:—

1. A wrench comprising a handle member 25 having a bifurcated end formed with alined openings and having a configuration to produce a ratchet member space, said member carrying a pawl operative within the space, a ratchet member having an opening adapted 30 to aline with the handle member openings when in operative position, and a work-engaging member having a shank insertible into the alined openings, said shank carrying a projecting lug, said ratchet and handle 35 members having recesses complementary to said lug to permit positioning of the lug within the ratchet recess.

2. A wrench as in claim 1, characterized by means for holding the positioned work- 40 performing member against movement in the direction of its axis.

3. A wrench as in claim 1, characterized in that the work engaging member is shift- 45 able axially to permit of selective ratchet or non-ratchet operation.

4. A wrench comprising a handle member having a bifurcated end formed with alined openings and having a configuration to produce a ratchet member space, said member 50 carrying a pawl operative within the space, a ratchet member having an opening adapted to aline with the handle member openings when in operative position, and a work-engaging member having a shank insertible 55 into the alined openings, said shank carrying a projecting lug, said ratchet and handle members having recesses complementary to said lug, the recess of the ratchet member being out of alinement with a handle member recess when the ratchet member is in the 60 drive position of any of its teeth.

5. A wrench comprising a handle member having a bifurcated end formed with alined openings and having a configuration to produce a ratchet member space said member 65

carrying a pawl operative within the space, a ratchet member having an opening adapted to aline with the handle member openings when in operative position, and a work- 70 engaging member having a shank insertible into the alined openings, said shank carrying a projecting lug, said ratchet and handle members having recesses complementary to said lug, the recess of the ratchet member being out of alinement with the handle member 75 recess when the ratchet member is in the drive position of any of its teeth, movement of the ratchet and work-engaging members angularly away from drive position providing alinement of handle and ratchet member 80 recesses and permitting axial movement of the work-engaging member.

6. A wrench comprising a handle member having a bifurcated end formed with alined openings and having a configuration to produce 85 a ratchet member space, said member carrying a pawl operative within the space, a ratchet member having an opening adapted to aline with the handle member openings when in operative position, and a work- 90 engaging member having a shank insertible into the alined openings, said shank carrying a projecting lug, said ratchet and handle members having recesses complementary to said lug, either of said recesses being adapted 95 to cooperate with the lug to provide drive relation between the handle and work-engaging members.

7. A wrench comprising a handle member having a bifurcated end formed with alined 100 openings and having a configuration to produce a ratchet member space, said member carrying a pawl operative within the space, a ratchet member having an opening adapted to aline with the handle member openings 105 when in operative position, and a work-engaging member having a shank insertible into the alined openings, said shank carrying a projecting lug, said ratchet and handle members having recesses complementary to 110 said lug, either of the handle member recesses permitting access of the lug to the ratchet member recess whereby direction of ratchet action may be selected.

8. A wrench as in claim 6, characterized 115 in that the ratchet member recess is out of alinement with a handle member recess when the ratchet member is in the drive position of any of its teeth, whereby the ratchet face may form a supporting abutment for the lug 120 when the latter is cooperating with such handle member recess.

9. A wrench comprising a handle member having a bifurcated end formed with alined openings and having a configuration to produce 125 a ratchet member space, said member carrying a pawl operative within the space, a ratchet member having an opening adapted to aline with the handle member openings when in operative position, and a work-en- 130

gaging member having a shank insertible
into the alined openings, said shank carry-
ing a projecting lug, said ratchet and handle
members having recesses complementary to
5 said lug, whereby said lug may be located
in either of such recesses to provide drive
relation between the handle and work-en-
gaging members, means being provided for

holding said work-engaging member against
axial movement when in either position. 10

In testimony whereof I affix my signature
in the presence of two witnesses.

GEORGE FORTON.

Witnesses:—

ANNA M. DORR,

CHAS. W. STAUFFIGER.