United States Patent [19]

Siebert

[11] **3,867,855**

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[54] LEVER ACTUATED RATCHET WRENCH

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[52] **U.S. Cl.** **81/63.1**

[51] **Int. Cl.** **B25b 13/46**

[58] **Field of Search** 81/62, 58.1, 63.1

[56] **References Cited**

UNITED STATES PATENTS

2,508,568 5/1950 Ellison 81/62

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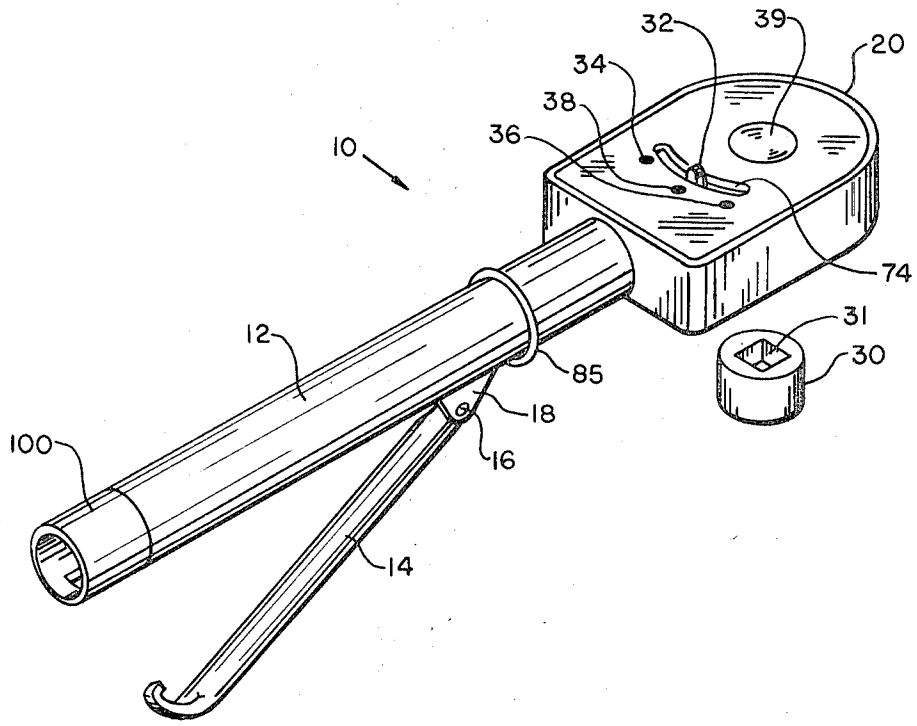
Attorney, Agent, or Firm—Burton, Crandell & Polumbus

[57] **ABSTRACT**

A lever actuated ratchet wrench is disclosed herein and includes a handle, a ratchet component housing, a ratchet gear mounted within the housing for substantially 360 degree rotation in either of two opposite directions, and a lever connectable with the ratchet gear and movable between a first point and a second point for rotating the latter. A ratchet gear rotation control arrangement is operably positioned between the lever and ratchet gear and, in response to the movement of the lever from the first said point to the second point, alternatively rotates the latter in either of the two opposite directions depending upon the position of the rotation control arrangement. In addition, the rotation control arrangement is provided with another position so that the ratchet gear is prevented from rotating when the lever is actuated and, alternatively, allowed to freely rotate in either direction when the lever is maintained in its unactuated position.

18 Claims, 10 Drawing Figures



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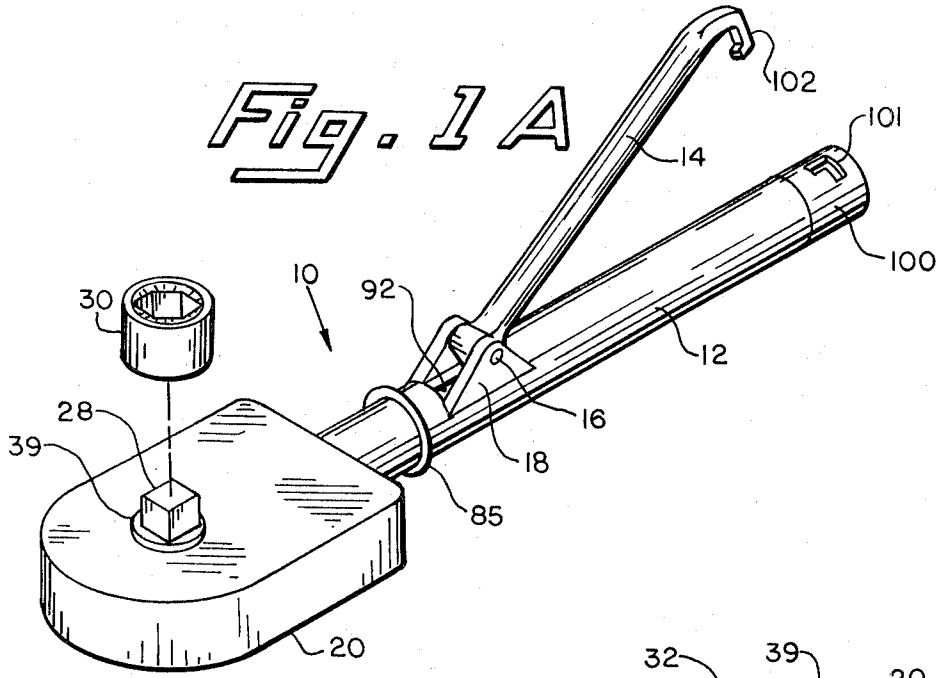
SHEET 1 OF 4

Fig. 1A



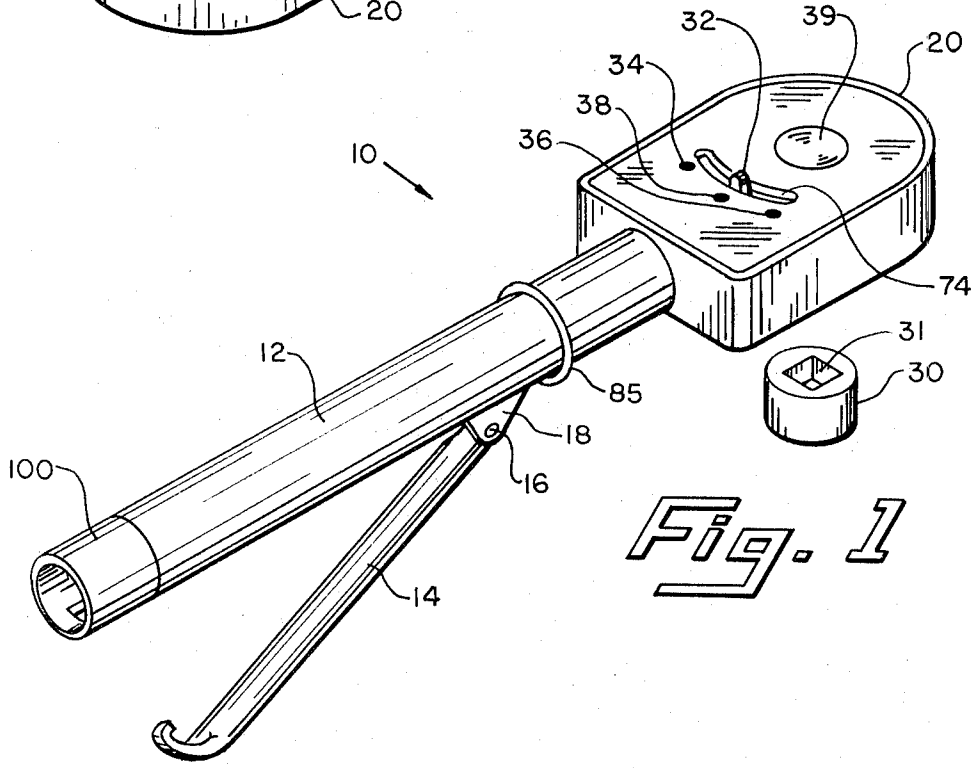


Fig. 1

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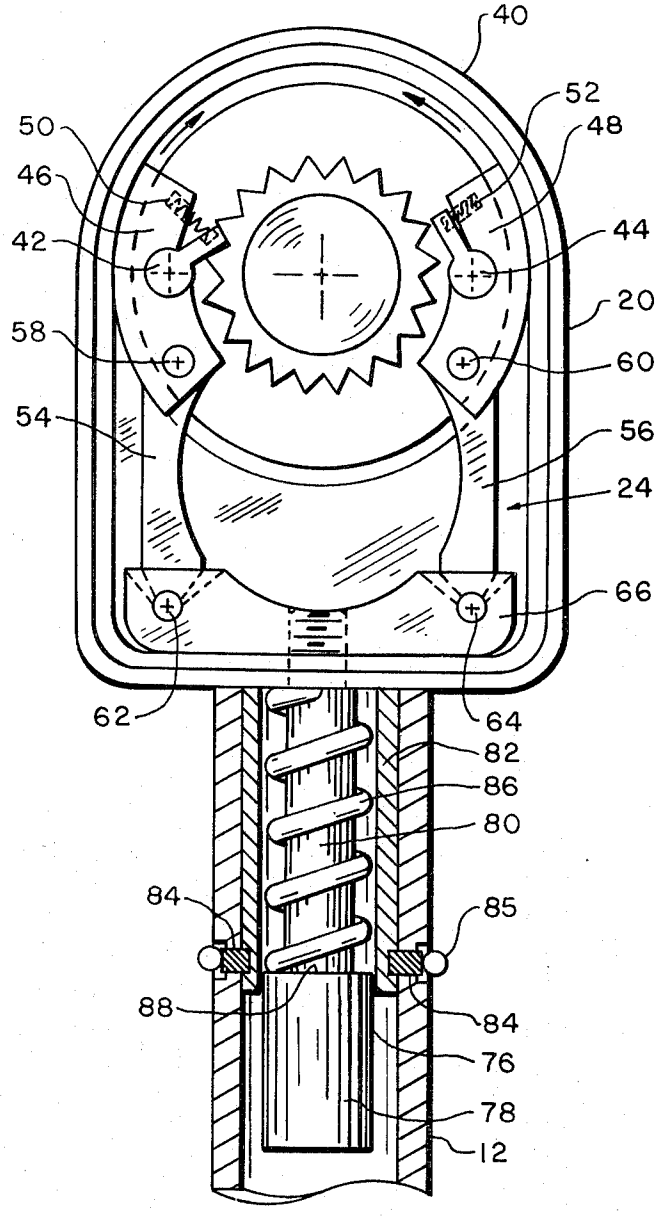

Fig. 2

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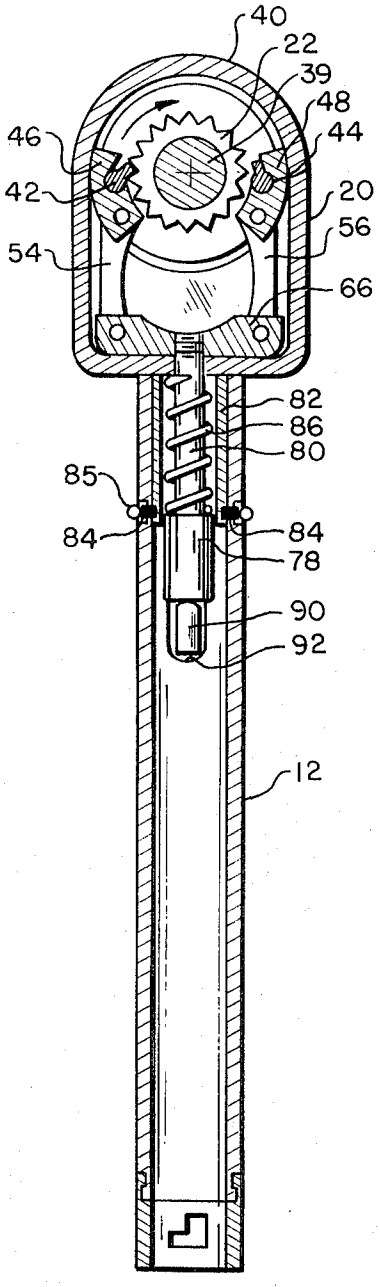

Fig. 3

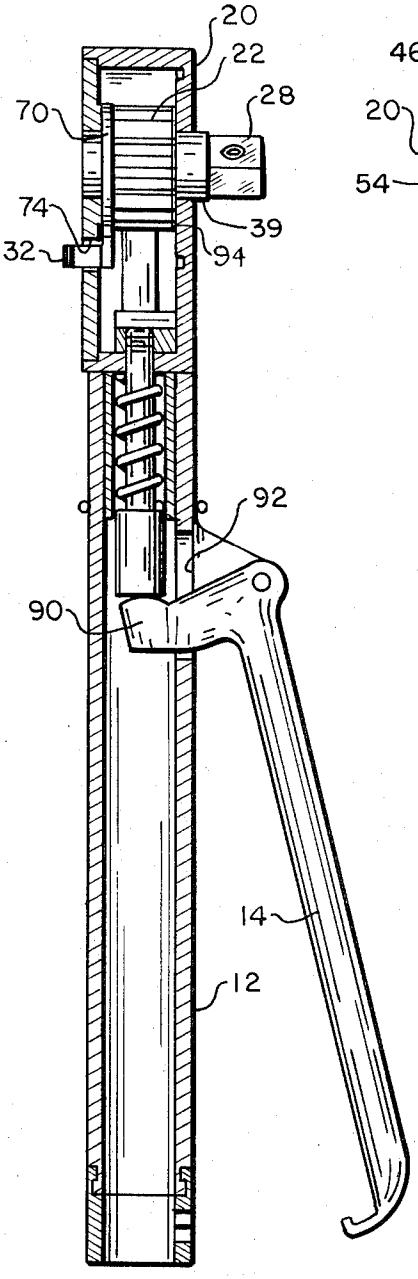

Fig. 4

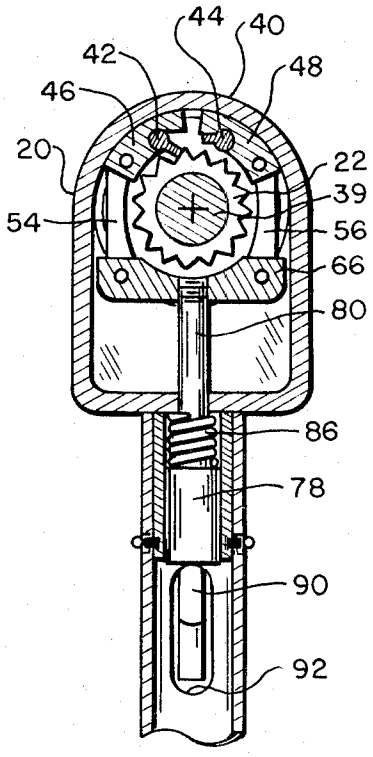

Fig. 5

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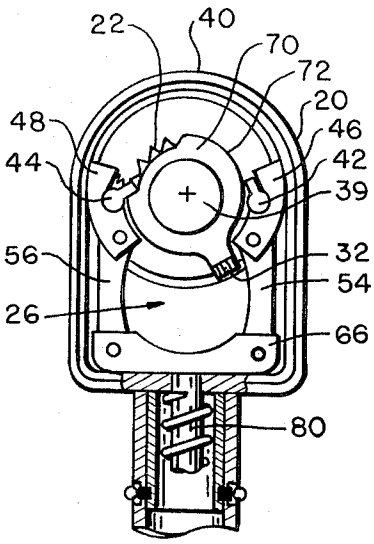

Fig. 6

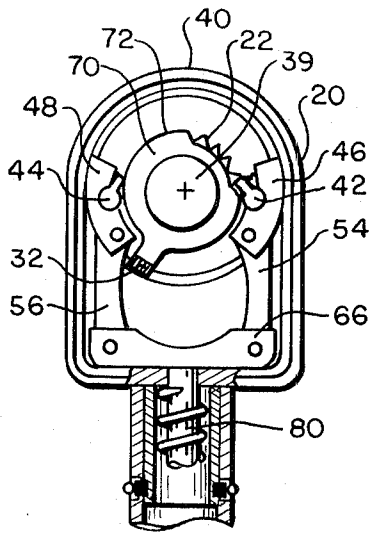

Fig. 7

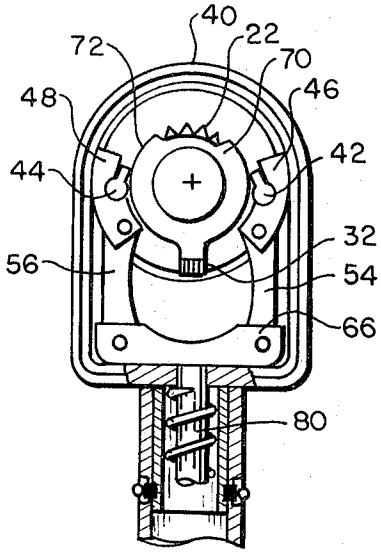

Fig. 8

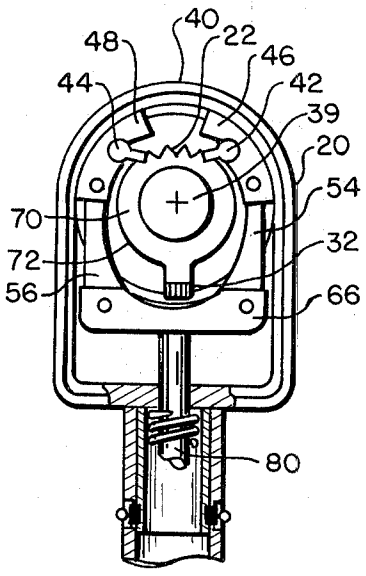

Fig. 9

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LEVER ACTUATED RATCHET WRENCH

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to wrench assemblies and more particularly to lever actuated ratchet-type wrench assemblies.

2. Description of the Prior Art

Today, there are many diverse types of wrenches readily available to both the amateur as well as the professional mechanic. For example, there is the all-purpose standard adjustable jaw or open-end type wrench which is adapted to grip a bolt or other such work piece and turn the latter by manual rotation of the handle. This type of wrench is quite satisfactory where there is sufficient working space for both initial positioning and maneuverability. However, where space is at a minimum a more sophisticated wrench assembly is required. Accordingly, more complicated ratchet-type wrench assemblies designed for a particular application or applications have been developed.

One typical family of ratchet-type wrench assemblies disclosed by the prior art includes a lever or other suitable squeeze action mechanism for rotating a ratchet gear. While many of these assemblies are suitable for a particular intended application, i.e., the particular application for which they were specifically designed, few have been found adaptable for a variety of applications. For example, some of the ratchet-type wrench assemblies utilizing lever action to rotate a ratchet gear limit the gear to either clockwise or counterclockwise rotation in response to actuation of the lever. While this may be satisfactory in, for example, tightening a bolt (where rotation is clockwise) it would be useless in loosening the same bolt. Furthermore, many of these types of assemblies cannot be converted into standard wrenches or ratchet wrenches which are manually rotated by the handle. On the other hand, those that can be converted require difficult manipulation in making the conversion and/or require complex maneuverability in actually tightening or loosening a bolt or other such fastening means.

In addition to the foregoing problems in adaptability, many of the lever-actuated ratchet wrenches available are unduly restricted in the manner in which they can be positioned relative to a bolt or other fastening means. For example, movement of the lever relative to the bolt engaging means of the wrench is at best a limited movement. Accordingly, in many applications, after the wrench is engaged with the bolt, if it can at all be positioned for engagement, the lever is inaccessable for gripping or squeezing action. In other words, working clearance for many applications must be at a maximum.

Therefore, while there are many types of ratchet wrench assemblies and particularly lever actuated assemblies, most lack the versatility, reliability and maneuverability necessary in a variety of operations. Some of these wrenches are shown in U.S. Pat. Nos. 1,913,669, 2,726,563, 3,175,434, and 3,286,560.

SUMMARY OF THE INVENTION

The wrench assembly of the present invention, which assembly provides a heretofore unavailable improvement over previous wrench assemblies and particularly lever actuated wrench assemblies, includes a plurality of components which cooperate to perform a variety of wrench operations in an uncomplicated manner and with minimal manipulation of the wrench assembly. Specifically, an object of the present invention is to provide a new and improved wrench assembly which is easily adaptable for use in many applications.

Another object of the present invention is to provide a new and improved wrench assembly which requires minimal maneuverability space for most applications.

Yet another object of the present invention is to provide a new and improved wrench assembly which is easily manipulated for converting from one application to another.

Still another object of the present invention is to provide a new and improved wrench assembly which performs several wrench related operations and yet which is uncomplicated in design and economical to manufacture.

Yet another object of the present invention is to provide a wrench assembly wherein the handle or gripping portion thereof can be rotated 360° in either of two opposite directions relative to the nut or bolt engaging end of the assembly, thereby providing greater accessability to an otherwise poorly located workpiece.

A further object of the present invention is to provide a new and improved ratchet type wrench assembly which can be easily converted to a standard wrench and back to the ratchet-type wrench.

Yet a further object of the present invention is to provide a ratchet-type wrench assembly of the last-mentioned type which, when in its standard wrench position, is adapted to grip and turn a workpiece and yet which includes ahandle capable of rotating in alternate opposite direction relative to the workpiece without disengaging the latter from the wrench assembly.

Still a further object of the present invention is to provide a new and improved lever actuated ratchet wrench which provides increased rotational movement of a ratchet gear in response to a single actuation of the lever and which provides an increased availability in torque in response to a single actuation.

Yet a further object of the present invention is to provide a lever actuated ratchet wrench of the last-mentioned type wherein the lever mechanism is movable relative to the workpiece engaging means for providing a comfortable gripping position.

Still a further object of the present invention is to provide a lever actuated ratchet wrench of the last-mentioned type wherein the workpiece can be alternatively rotated in opposite directions in response to the same type of squeezing action of the lever mechanism.

Yet a further object of the present invention is to provide a lever actuated ratchet wrench of the last-mentioned type wherein the lever mechanism when held in one position allows the ratchet gear to rotate freely in opposite directions and when held in a second position prevents the ratchet gear from rotating at all.

Another object of this invention is to provide a lever-actuated ratchet wrench having a friction providing means (such as a wave or spring washer) for partially inhibiting the rotation of the ratchet gear of said wrench thereby preventing unresponsive rotation of the ratchet gear upon retraction of the pawl.

These and other objects and features of the present invention will become apparent from the following descriptions:

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 is a perspective front view of the wrench assembly constructed in accordance with the present invention;

FIG. 1A is a perspective back view of the wrench assembly of FIG. 1;

FIG. 2 is a front sectional view showing a portion of the assembly of FIGS. 1 and 1A;

FIG. 3 is a front sectional view of the assembly of FIGS. 1 and 2 with the assembly in a first operating position;

FIG. 4 is a side sectional view of the assembly of FIGS. 1 and 2;

FIG. 5 is a front sectional view of a part of the assembly of FIGS. 1 and 2 with the assembly in a second operating position; and

FIGS. 6 and 9 are respective front sectional views of a part of the assembly of FIGS. 1 and 2 with the assembly in various other operating positions.

DETAILED DESCRIPTION

In accordance with the present invention, a versatile lever actuated ratchet wrench is provided for driving a variety of different size fastener sockets in a number of different ways so as to easily adapt to the specific required application. This is accomplished by utilizing a ratchet gear positioned within an encasement or housing and mounted for 360° rotation in either the clockwise or counterclockwise direction. The ratchet gear is rotated in response to the squeezing action of a lever positioned in gripping relationship with the wrench's handle and accordingly drives a socket plug adapted to receive any one of the different size sockets.

A ratchet gear rotation control assembly including a pair of pawls removably engageable with the ratchet gear and a three-position rotation selector arrangement including a cam mechanism adapted to selectably disengage one or both of the pawls from the ratchet gear are operably positioned between the ratchet gear and lever. In this manner, when the rotation selector arrangement is in a first position, the cam mechanism disengages one of the pawls from the ratchet gear so that the latter may rotate in, for example, a clockwise direction in response to actuation of the lever. On the other hand, when the selector arrangement is in a second position, the cam mechanism disengages the other pawl (the first pawl now being in engagement with the ratchet gear), thereby allowing the ratchet gear and socket plug to rotate in, for example, a counterclockwise direction in response to the same lever movement. Accordingly, a fastening device such as a bolt or nut can be either tightened or loosened without changing the position of the wrench or the manner in which the lever is actuated.

When the rotation selector arrangement is in a third position, and with the lever unactuated, the cam mechanism disengages both of the pawls from the ratchet gear allowing the latter to freely rotate in either direction. However, when the lever is actuated, that is, squeezed against the handle, the pawls, in response thereto, simultaneously move off the cam mechanism and back into engagement with the ratchet gear for preventing the latter from rotating in either direction. Upon releasing the lever, the pawls will automatically move back onto the cam mechanism.

Accordingly, with the rotation selector arrangement in the aforedescribed third position and with the lever actuated, the lever actuated ratchet wrench of the present invention operably provides a standard manual wrench which is adapted to tighten or loosen a fastening device by merely rotating the handle. In addition, however, without further manipulation other than releasing the lever, the handle of the wrench can be rotated in either direction about the axis of the fastening device without moving the latter or disengaging the socket therefrom.

Where surrounding obstructions allow but also limit rotation of the wrench handle to, for example, 180° about the axis of the fastening device, the aforedescribed standard wrench operation may be desirable. This is made even more desirable by considering the fact that the handle, after being rotated the full 180° for driving the fastening device, can be moved back to its starting position merely by releasing the lever and rotating the handle. An important feature here is that this can be done for either tightening or loosening the fastening device without disengaging the socket plug and without readjustment to the wrench when changing from, for example, a tightening operation to a loosening operation.

As stated hereinabove, the ratchet gear is positioned and mounted within a housing or encasement for rotating a socket plug about an axis which is, in most cases, coaxial with the fastening device. This is, of course, generally true with most lever actuated ratchet wrenches of the prior art. Accordingly, the position of the lever mechanism of these prior art wrenches is, for the most part, completely dependent upon or drastically limited by the axial position of the fastening device and socket plug. Considering possible obstructions surrounding the fastening device, it is quite possible that the lever of the wrench will be in an inaccessable position after the socket plug is engaged with the fastening device or may, in fact, prevent proper positioning for engaging the latter.

However, in accordance with the present invention, the ratchet gear housing is mounted to one end of the handle for **360** degree rotation in either direction about an extension of the handle's axis, which axis is normal to the axis of the socket plub. Accordingly, plug. lever, which is connected with the handle, may be rotated and appropriately positioned at any point around the axis of the handle for providing best accessability thereto.

The foregoing features and advantages of the present invention, as well as others, will become more apparent from the following description of the drawings wherein like components are designated by like reference numerals throughout the various figures. Turning specifically to FIG. 1 and FIG. 1A, a lever actuated ratchet wrench, constructed in accordance with the present invention, is illustrated and generally designated by the reference numeral **10.** The ratchet wrench includes an elongated handle **12** and lever **14** connected in gripping relationship to the handle for movement between an unactuated position, as illustrated by solid lines in FIG. **1,** and an actuated position in which lever **14** is squeezed against the handle **12.** In this regard, one end of the lever is pivotally connected near one end of the handle by a pivot pin **16** and outwardly projecting flanges **18** provided with the handle.

As illustrated in FIG. **1,** wrench **10** also includes a housing **20** which, as will be seen hereinafter, houses a ratchet gear **22** (FIG. **2**), a ratchet gear rotation control assembly **24** (FIG. **2**) and a three position rotation selector arrangement **26** (FIGS. **6** to **9**), all of which are

provided for controlling the rotation of a rectangular socket plug **28** in response to movement of lever **14**, as seen in FIG. 1A. The socket plug is adapted for insertion into a fastener socket **30** through a standard sized opening **31** adapted to lock the socket to the socket plug for rotation therewith. In this manner, sockets of various sizes can be used with the wrench of the present invention. In addition, as will become apparent hereinafter, wrench **10** can be used to operate a flexible drive cable (not shown) which, heretofore, was in many cases, very impractical.

From an operability standpoint, lever actuated ratchet wrench **10** includes a selector switch **32**, which is actually part of selector arrangement **26** and which is positioned on the back side of housing **20** and movable between three positions generally designated by the reference numerals **34, 36** and **38**. With the selector switch in position **34**, the lever may be actuated or squeezed together with handle **12** for rotating the socket plug in, for example, a clockwise direction as viewed in FIG. **1**. On the other hand, by turning the selector switch to position **36**, actuation of the lever will rotate the socket plug in, for example, a counterclockwise direction.

On the other hand, when selector switch **32** is in position **38**, actuation of lever **14** prevents the socket plug **28** from rotating in either direction and thus provides a standard wrench as stated hereinabove. However, by merely releasing the handle, which will be seen hereinafter is spring biased to its unactuated or extended position, the socket plug is free to rotate in either direction. In this manner, wrench **10** can be utilized for turning a fastening device, for example 180° (with the lever squeezed) by manually rotating the handle and moved back to the starting position without affecting movement of the fastening device merely by releasing the lever. As stated above, this can be achieved for both clockwise and counterclockwise movement without further adjustment of the wrench.

As illustrated in FIG. 1A, the axis of handle **12** is normal to the axis of socket plug **28** and socket **30** and, in most cases, would be normal to the axis of an engaged fastening device. Accordingly, the position of lever **14** is initially dependent upon the axial position of the socket **30** and fastening device which the latter engages. This initial position could, of course, be a very inconvenient one, considering the possible surrounding obstructions. However, in accordance with another feature of the present invention, handle **12** is connected with housing **20** for 360° axial rotation in either clockwise or counterclockwise direction relative to the housing, as will be seen hereinafter. In this manner, lever **14**, which rotates along with handle **12** relative to housing **20**, may be positioned at any point about the axis of the housing for providing a comfortable grip and does not depend completely for positioning upon the position of the fastening device to be worked on.

Turning now to FIG. **3**, attention is directed to ratchet gear **22**, ratchet gear rotation control assembly **24** and the manner in which the two cooperate with each other. Specifically, the ratchet gear, which has its periphery defined by inner connecting teeth, is centrally mounted in a fixed relationship about and to a shaft **39** which, in turn, is mounted to housing **20** for axial rotation in either of the clockwise or counterclockwise direction as viewed in FIG. **3**. In this regard, shaft **39** is connected at one end with socket plug **28** for imparting rotation thereto. For reasons to be discussed hereinafter, the ratchet gear is concentrically positioned within a circle which is partially defined by a curvilinear end **40** of housing **20**.

Ratchet gear rotation control assembly **24** includes two keyhole shaped pawls **42** and **44**, each of which is pivotally positioned within a cooperating socket defined by a respective pawl carrier **46** and **48**, the pawl carriers being positioned on opposite sides of the ratchet gear as illustrated in FIG. **2**. Each of the respective pawl carriers includes an aperture which houses a portion of a spring element **50** and **52**, respectively. As illustrated, the outwardly extending ends of these spring elements are attached to pawls **42** and **44** for spring biasing the latter into engaging relationship with opposite sides of ratchet gear **22**. Actually, while both of the pawls are so biased, at least one of the pawls is disengaged from the ratchet gear when the lever is in an unactuated position as will be seen hereinafter.

As illustrated in FIG. **2**, the pawl carriers **46** and **48** are respectively pivotally mounted at common ends to common ends of a pair of elongated linking elements **54** and **56** by suitable pivot pins **58** and **60**. By the same token, the otherwise free ends of linking elements **54** and **56** are pivotally connected by respective pivot pins **62** and **64** to opposite ends of a connector bar **66** which is positioned within housing **20** for movement between a first position away from ratchet gear **22**, as illustrated best in FIG. **2**, and a second position adjacent the ratchet gear, as illustrated best in FIG. **5**.

Operationally, when the connector bar **66** is moved from its rearward position to its forward position, which, as will be seen hereinafter, is achieved by actuating lever **14**, the linking elements **54** and **56** are forced forward in a substantially straight line path. This, in turn, causes pawl carriers **46** and **48** to pivot slightly about points **58** and **60** and simultaneously slidably move in arcuate paths around the inside surface of housing portion **40** and toward each other. In this regard, the sliding surfaces of the pawl carriers are preferably shaped complementary to housing portion **40**, as best illustrated in FIG. **5**, so that maximum movement around the ratchet gear **22** is achieved. In this manner, as will be seen hereinafter, one squeeze of lever **14** can cause rotation control assembly **24** to rotate ratchet gear as much as, for example, approximately 60°.

Turning to FIGS. **6** through **9**, attention is directed to rotation selector arrangement **26** which, as stated above, includes selector switch **32**. In addition thereto, arrangement **26** includes a ring-shaped cam element **70** slidably mounted concentrically about shaft **39** between ratchet gear **22** and the back inside surface of housing **20**, as illustrated best in FIG. **2**. As illustrated, slightly more than one-half of the cam element is substantially greater in diameter than the remaining portion thereof so as to define an arcuate cam surface **72** which, as will be seen below, is adapted to engage the pawls **42** and **44** for disengaging the latter from ratchet gear **22**. Selector switch **32** is connected, preferably integrally so, to this cam surface **72** at approximately the midpoint thereof and extends out of housing **20** through an arcuate slot **74** (see FIGS. **1**).

Operationally, when selector switch **32** is in position **34** and lever **14** in an unactuated position, the cam element is positioned in the manner illustrated in FIG. **7** so as to disengage pawl **44** from ratchet gear **22**. Upon moving the selector switchto position **36**, the cam ele-

ment is rotated counterclockwise as viewed in FIG. 6 for disengaging pawl 42 from the ratchet gear and simultaneously freeing pawl 44 so that it may return to its engaging position with respect to the ratchet gear. On the other hand, when the selector switch is moved to position 38, as illustrated in FIG. 8, the cam surface 72 of cam element 70 forces both of the pawls out of engagement with the ratchet gear. In this regard, it should be noted that the selector switch and ring-shaped cam element may be provided with an appropriate biasing element (not shown) for allowing the switch and cam element to effectively toggle between positions 34, 36 and 38 or it may be designed with a certain degree of friction for preventing self-movement.

Returning to FIG. 2 in conjunction with FIG. 4, attention is directed to the manner in which lever 14 moves connector bar 66 between the aforedescribed rearward and forward positions. Specifically, an elongated plunger 76 having one cylindrical end portion 78 and a radially thinner opposite end portion 80 is positioned concentrically within handle 12 so that the free end of portion 80 extends into housing 20 through a cooperating aperture provided thereby. In this regard, the inserted end of portion 80 is threaded for fastening into a cooperating threaded aperture centrally positioned through connector bar 66, as illustrated in FIG. 2. An elongated cylindrical sleeve 82 displaying an axial length substantially equal to the length of plunger portion 80 and an inner diameter slightly larger than the diameter of plunger portion 78 is positioned coaxially about plunger portion 80, as illustrated best in FIG. 2. The sleeve is held in this position by a plurality of, for example, crescent shaped keys 84 extending through the handle and into the sleeve and retained by a ring spring 85 positioned concentrically about handle 12. With the sleeve positioned in this manner, an elongated spring element 86 is positioned concentrically about plunger portion 80 between the latter and the sleeve so as to engage the housing 20 at one end and an annular shoulder 88 at its other end, the shoulder being formed by the joinder of plunger portions 78 and 80. In this manner, plunger 76 is biased in the position illustrated in FIG. 2.

As illustrated best in FIG. 4, lever 14 includes a plunger engaging portion 90 extending from the pivotally connected end of the lever into an elongated slot 92 provided through handle 12. Portion 90 is positioned in abutting engagement with the free end of plunger portion 78. In this manner, as the lever arm is squeezed or otherwise moved towards handle 12 causing compression of spring 86, plunger engaging portion 90 forces the plunger forward into sleeve 82 so that connector bar 66 is moved towards ratchet gear 22. Upon releasing the lever, the spring causes the plunger to move back to its biased position thereby causing the lever to move back to its unactuated position.

It should be noted that ends of handle 12 and sleeve 82 which are adjacent housing 20 are not fastened to the latter but are rather positioned in slidable engagement therewith. In this manner, the housing, plunger and spring element are capable of rotating 360° in either direction about the axis of handle 12. Accordingly, socket plug 28 and lever 14 can be positioned and repositioned relative to each other in the aforedescribed manner.

With lever actuated ratchet wrench 10 constructed in the aforedescribed manner, attention is now directed to its overall operation. Assuming that the lever is initially in an unactuated position, that is, away from handle 12, selector switch 32 is in position 34, and the cam element 70 is accordingly positioned as shown in FIG. 7 for disengaging pawl 44 from ratchet gear 22. At the same time, the other pawl 42 is allowed to engage the ratchet gear as illustrated best in FIG. 3. Upon squeezing lever 14, plunger 76 is driven into housing 20 causing the connector bar 66 to move towards the ratchet gear. This in turn causes linking elements 54 and 56 to move forward also, substantially in a straight line, forcing the pawl carriers in a pivoting fashion to move around the ratchet gear and toward each other, see FIG. 5. Since only the pawl 42 is engaged with the ratchet gear and since it is in biasing relationship therewith, it tends to pivot or turn within the socket provided by pawl carrier 46 as the latter moves about the ratchet gear for maintaining its engaging relationship therewith. In this manner, the ratchet gear is forced to rotate by the pawl in response to the movement of pawl carrier 46 for rotating socket plug 28 and socket 30 through shaft 39. Upon releasing the lever, spring element 86 forces the pawl carriers back to their initial positions, the pawl 44 sliding and the ratchet gear. In this regard, the ratchet gear and shaft 39 are provided with a certain degree of friction so that the ratchet gear will not tend to move back with the pawl 42. This may be achieved, for example, by placing a spring washer 94 (FIG. 4), having an abrasive surface, between the ratchet gear and front inside surface of housing 20.

With selector switch 32 in position 36 and with lever 14 in its unactuated position, cam element 70 is positioned in the manner illustrated in FIG. 6 for disengaging pawl 42 while allowing pawl 44 to freely engage the ratchet gear. In this position, operation of the wrench is similar to that described with respect to position 34 except that this time pawl 34 rotates the ratchet gear in an opposite direction.

When the selector switch is moved to position 38, i.e., the center position, and with the lever unactuated, cam element 7 is positioned so that cam surface 72 will disengage both pawls 42 and 44 as illustrated in FIG. 8. This, of course, allows the ratchet gear, socket plug and socket along with shaft 39 to freely rotate in either clockwise or counterclockwise direction. However, upon actuating lever 14, the pawl carriers are moved forward in the manner described above so that the pawls simultaneously move off of cam surface 72 and back into engagement with the ratchet gear. In this manner, the latter is prevented from rotating in either direction thereby providing standard wrench operation. In this regard, as illustrated best in FIG. 1A, the free end of handle 12 includes a handle extension 100 which is mounted for rotation thereto as shown best in FIGS. 3 and 4. The extension includes an L-shaped slot 101, one leg of which extends in the direction of the handle's axis and the other leg of which extends substantially normal thereto. On the other hand, the free end of lever 14 includes a complementary L-shaped portion 102 one leg of which extends towards the slot and the other leg of which extends towards housing 20. In this manner, L-shaped portion 102 can be inserted into the axially extending leg of slot 101 as the lever is actuated and locked to the handle extension 100 by rotating the extension slightly such that the lower leg portion 102 rests within the leg of the slot disposed normal

to the handle's longitudinal axis. Hence, lever **14** may be easily locked in its actuated position.

Although one embodiment of the present invention has been illustrated and described, it is anticipated that various changes and modifications will be apparent to those skilled in the art, and that such changes may be made without departing from the true scope of the present invention as defined by the appended claims. For example, when the wrench is used in a "confined" area but where movement of as little as one-sixteenth inch is permitted, it will be realized that, following actuation of the lever, an additional amount of torque may be applied through the wrench by pivoting the handle **12** through the limited arc through which movement occur. Thus, it has been found that the approximate amount of 100 pound inches of torque that can be transmitted (in one embodiment of a wrench constructed in accordance with this invention) through the actuation of the lever may be doubled by pivoting the handle as aforesaid.

What is claimed is:

1. A ratchet wrench assembly comprising:

a. a handle;

b. a ratchet component support connected with said handle;

c. a ratchet gear mounted to said support for substantially 360° rotation in either of two opposite directions;

d. actuating means operably connectable with said ratchet gear and movable between a first point and a second point for rotating said ratchet gear;

e. a ratchet gear rotation control assembly operably positioned between said actuating means and said ratchet gear, (i) said assembly being positionable in a first position for rotating said ratchet gear in one direction in response to the movement of said actuating means from said first point to said second point, (ii) said assembly being positionable in a second position for rotating said ratchet gear in an opposite direction in response to the movement of said ac-tuating means from said first point to said second point, and (iii) said assembly being positionable in a third position for freeing said ratchet gear for rotation in either of said opposite directions when said actuating means is at one of said first and second points; and

f. a rotation selector arrangement connected with said ratchet gear rotation control assembly for alternatively positioning said rotation control assembly in said first, second and third positions whereby said wrench assembly is adapted alternatively to rotate a work piece in opposite directions utilizing similar actuating motion and whereby the handle of said assembly may be repositioned from one point to another without effecting movement of the work piece and yet without disengaging the wrench assembly from the work piece.

2. A wrench assembly according to claim **1** wherein said ratchet gear rotation control assembly includes means for substantially completely preventing said ratchet gear from rotating when said rotation selector arrangement is in said third position and said actuating means is at the other of said first and second points, whereby said wrench assembly is adapted to rotate a work piece by manual movement of said handle.

3. A wrench assembly according to claim **1** wherein said actuating means is connected for movement with said handle and wherein said support is connected with said handle for substantially 360° rotational movement relative to said handle whereby said handle and actuating means may be advantageously positioned relative to a work piece.

4. A wrench assembly according to claim **1** wherein said ratchet gear rotation control assembly includes means for rotating said ratchet gear approximately 60° in response to the movement of said actuating means from said first point to said second point when said rotation selector arrangement is in either said first or second position.

5. A wrench assembly comprising:

a. a handle;

b. a rotation coupling member mounted for rotation in either direction upon said handle;

c. a locking assembly mounted upon said handle selectively operable to lock said coupling member against rotation in either or both directions of rotation relative to said handle or to permit free rotation of said coupling member in either direction relative to said handle.

6. The invention defined in claim **5** wherein said locking assembly comprises:

a ratchet wheel fixedly coupled to said coupling member for roJation therewith,

a pawl carrier mounted for reciprocatory movement relative to said handle between a first and a second position,

a pair of ratchet wheel engaging pawls pivotally mounted on said carrier to be located at diametrically opposite sides of said ratchet wheel when said carrier is in said first position, said pawls being biassed into engagement with said wheel,

first means for selectively disengaging either or both of said pawls from said wheel when said carrier is in said first position,

actuating means for shifting said carrier between said first position and said second position, movement of said carrier from said first position to said second position being operable

a. to drive said ratchet wheel in an increment of rotation when one of said pawls is engaged within said wheel when said carrier is in said first position or

b. to lock said wheel against rotation when neither pawl is engaged with said wheel when said carrier is in said first position.

7. A wrench assembly comprising:

a. a handle;

b. a support member connected with said handle;

c. a rotation coupling member operably connectable with a work piece for imparting rotational movement thereto, said coupling member being mounted to said support member for 360° rotation in either of two opposite directions;

d. actuating means operably connectable with said coupling member and movable between a first point and a second point for rotating said coupling member;

e. a coupling member rotation control assembly operably positioned between said actuating means and said coupling member, (i) said rotation control assembly being positionable in a first position for rotating said coupling member in one direction in response to the movement of said actuating means from said first point to said second point, (ii) said

assembly being positionable in a second position for rotating said coupling member in an oposite direction in response to the movement of said actuating means from said first point to said second point and, (iii) said assembly being positionable in a third position for freeing said coupling member for rotation in either of said opposite directions when said actuating means is at one of said first and second points; and

f. a rotation selector arrangement connected with said coupling member rotation control assembly for alternatively positioning said rotation control assembly in said first, second and third positions whereby said wrench assembly is adapted to alternatively rotate a work piece in opposite directions utilizing similar actuating motion and whereby the handle of said assembly may be repositioned from one point to another without effecting movement of the work piece and yet without disengaging the wrench assembly from the work piece.

8. A wrench assembly comprising:

a. a handle;

b. a support member connected with said handle;

c. a rotation coupling member operably connectable with a work piece for imparting rotational movement thereto, said coupling member being rotatably mounted to said support member;

d. an actuator movable between a first point and a second point relative to said handle;

e. means operably located between said actuator and said coupling member and movable between a first position for rotating said coupling member in response to the movement of said actuator from said first point to said second point and a second position for allowing said coupling member to freely rotate when said actuator is at one of said two points and for preventing said coupling member from rotating when said actuator member is at the second point; and

f. means for moving said last-mentioned means between said two positions.

9. A lever actuated wrench assembly comprising:

a. a handle;

b. a support member mounted with said handle;

c. a ratchet gear mounted to said support member for 360° rotation in either of two opposite directions;

d. a lever movable between first and second points relative to said handle;

e. a pair of pawls positioned adjacent said ratchet gear and movable in arcuate paths towards and away from each other;

f. linking means connecting said pawls with said lever for substantially simultaneously moving said pawls in said arcuate paths in response to the movement of said lever; and

g. means forcing one of said pawls into engagement with said ratchet gear, at least throughout a portion of the arcuate path when said engaged pawl is moved towards the other pawl, for rotating said ratchet gear.

10. A lever actuated wrench assembly according to claim **9** wherein said support member includes an arcuate surface portion and wherein said linking means includes two pawl carriers respectively supporting said pawls for movement in said arcuate paths, said pawl carriers being movable along the arcuate surface portion in response to the movement of said lever.

11. A lever actuated wrench assembly according to claim **10** wherein said pawls are respectively pivotally mounted to said pawl carriers and wherein said forcing means includes means for biasing said pawls in engaging relationship with said ratchet gear.

12. A lever actuated wrench assembly according to claim **11** including means for selectively disengaging one or both of said pawls from said ratchet gear when said lever is at said first point.

13. A lever actuated wrench assembly according to claim **12** wherein said last-mentioned means includes a cam member mounted to said support member for movement between a first position for disengaging one of said pawls, a second position for disengaging the other of said pawls, and a third position for simultaneously disengaging both of said pawls.

14. A lever actuated wrench assembly according to claim **13** wherein said cam member when in its third position allows reengagement of said pawls with said ratchet gear when said lever is at said second point.

15. A lever actuated wrench assembly according to claim **9** including a friction producing washer for partially inhibiting the rotation of said ratchet gear thereby preventing unresponsive rotation of said gear.

16. A lever actuated wrench assembly comprising:

a. a handle;

b. a support member mounted with said handle;

c. a ratchet gear mounted to said support member for 360° rotation in either of two opposite directions;

d. a lever movable between first and second points relative to said handle;

e. first and second pawls pivotally mounted adjacent said ratchet gear and movable between first and second positions;

f. linking means connecting said pawls with said lever for substantially simultaneously moving said pawls in response to the movement of said lever;

g. means for biasing said pawls in engaging relationship with said ratchet gear; and

h. means for selectively disengaging one or both of said pawls from said ratchet gear when said lever is at said first point, said last-mentioned means including a cam member mounted to said support member for movement between a first position for disengaging one of said pawls, a second position for disengaging the other of said pawls and a third position for simultaneously disengaging both of said pawls.

17. A lever actuated wrench assembly according to claim **16** wherein said cam member when in its third position allows reengagement of said pawls with said ratchet gear when said lever is at said second point.

18. A lever actuated wrench assembly according to claim **17** including means for locking said lever at said second point.

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