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WRENCHES

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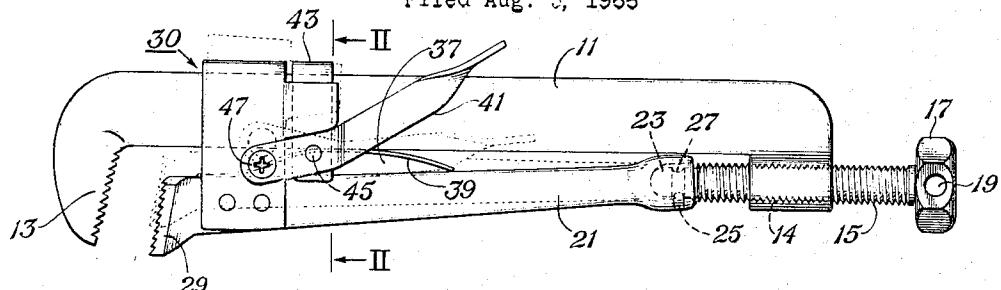


Fig. 1

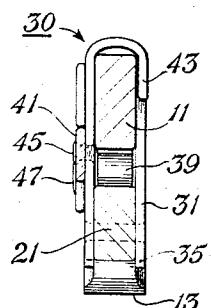


Fig. 2

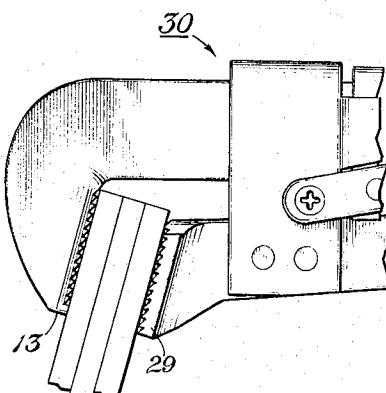


Fig. 3

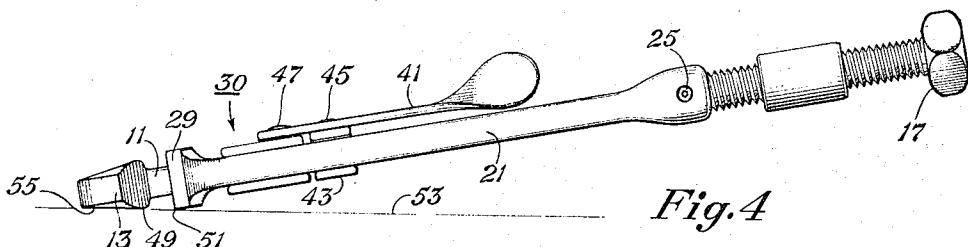


Fig. 4

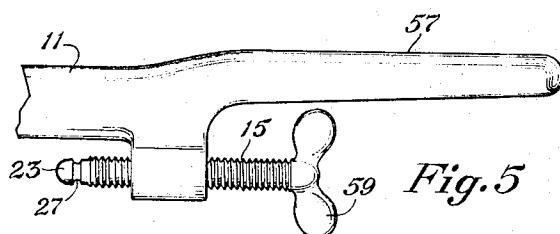


Fig. 5

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1

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## ABSTRACT OF THE DISCLOSURE

A wrench having a body supporting an upper jaw on one end and a substantially parallel, axially movable fastener on its other end. One end of an arm, which extends along the substantial length of the body, is pivotally secured to the fastener, and its other end supports a lower jaw. A carriage is secured to the jaw end of the arm and to the wrench body in a manner to permit transverse and reciprocable arm movement. A biasing spring urges the arm and lower jaw outward from the body, and a trigger mechanism is used to urge the body and arm together. The teeth of the jaw are formed on a surface disposed at an obtuse angle relative to the body, and the body, and the width of the upper jaw is less than that of the lower jaw.

My invention relates in general to wrenches, and in particular to a form of wrench that has improved operational and gripping characteristics.

It is accordingly the general object of my invention to provide an improved wrench.

Another object of my invention is to provide a wrench with superior gripping capabilities that may be released from the workpiece with convenient trigger means.

Another object of my invention is to provide a wrench with an improved gripping and release means actuated by a trigger which may be thumb operated without need for movement of the hand from the usual position.

Another object of my invention is to provide a wrench with a ratchet action that provides easier use with polygon shaped workpieces.

Another object of my invention is to provide a wrench with a jaw configuration that enables the edges of both jaws to lie flush against a plane when the handle end of the wrench is raised slightly from the plane.

These and other objects are effected by my invention as will be apparent from the following description taken in accordance with the accompanying drawing, forming a part of this application, in which:

FIG. 1 is a side elevational view of a wrench constructed in accordance with the principles of my invention;

FIG. 2 is a sectional view as seen looking along the lines II—II of FIG. 1;

FIG. 3 is a fragmentary side elevational view showing the jaws of the wrench of FIGS. 1 and 2 while gripping a workpiece;

FIG. 4 is a front elevational view of the wrench of FIG. 1; and

FIG. 5 is a fragmentary side elevational view showing a modified form of the wrench of FIG. 1.

The numeral 11 designates an elongated wrench body which has a jaw 13 formed on one end thereof and a threaded aperture 14 formed on the opposite or handle end thereof. The longitudinal axis of the threaded aperture 14 and the handle portion of the body 11 are substantially parallel, as may be seen in FIG. 1. A threaded fastener member 15 is rotatably secured in the threaded aperture 14, having one end portion 17 which in FIG. 1 is octagon in cross section with an aperture 19 extending transversely therethrough. The opposite end portion of the threaded fastener member 15 is pivotally secured to

2

one end region of an arm 21 by a hemispherical portion 23 which extends into a mating socket formed in the end of arm 21. A set screw 25 extends through a part of the arm 21 and into an annular groove 27 formed 5 slightly toward the midregion of the threaded fastener member from the hemispherical portion 23 thereof. Thus, the arm 21 has one end region thereof pivotally secured to the threaded fastener member 15, which is also used to move the arm member reciprocally with respect to the wrench body 11.

Carriage means 30 secures the end of arm 21 having jaw 29 thereon to the wrench body 11 and permits the above-mentioned reciprocal movement and also a predetermined amount of transverse movement with respect 15 to the longitudinal axis of said body. As shown in FIG. 2, the carriage means 30 in this instance comprises a U-shaped bracket 31 having its closed end portion extending around the edge of the wrench body 11 and with the open end 35 thereof secured to arm 21 by suitable 20 means such as welding. A space 37 may be normally seen between the body 11 and the arm 21.

Biasing means 39, which in this instance is a leaf spring, is secured between the body 11 and the arm 21 and to the body 11 to urge the jaw 29 of the arm transversely 25 away from wrench body. A trigger 41 is pivotally mounted to said wrench body by means of another bracket 43 and a pivot pin 45 and to the carriage means 30 by a pivot pin 47. One end portion of the trigger extends toward the handle end of the wrench body to enable 30 convenient movement with the thumb in a downward direction to urge the jaw 29 of arm 21 transversely toward the wrench body 11.

As shown in FIG. 4, the jaw 13 associated with wrench body 11 is narrower than the jaw 29 associated with arm 35 21 and hence the side edges 49, 51 of these jaws both may engage the plane 53 when the handle of the wrench body is raised slightly from the plane. Also, the head of the wrench is tapered as indicated by the numeral 55 to enable the edges 49, 51 of the jaws to lie flush with the 40 plane 53.

The jaws 13, 29 of the wrench are arranged to be essentially parallel with respect to each other when in working and gripping relation with each other, and the wrench if constructed in the manner thus far described 45 tends to eliminate the problems encountered with wrenches which have loosely fitting jaws.

As shown in FIG. 5, wrench body 11 may have a long extension 57 thereon to increase leverage, and also, the threaded fastener 15 may have a winged nut 59 to enable 50 more convenient hand operation.

In operation the wrench may be held in one hand while the other hand rotates the threaded fastener member 15 until the jaws 13 and 29 of the wrench body 11 and the arm 21 engage or almost engage a selected workpiece. Then the trigger 41 is depressed with the thumb, which moves the jaw 29 of arm 21 toward the jaw 13 of body 11, thus securely engaging the workpiece. When downward pressure is applied to the handle so that the wrench rotates in a clockwise direction (as viewed in FIG. 1), arm 21 tends to rotate toward body 11 and causes the jaws 13, 29 to more securely grip the workpiece. Nevertheless, the workpiece may be conveniently released by stopping the clockwise rotation of the wrench and moving it slightly in a counterclockwise direction.

It should be apparent from the foregoing that I have provided an invention having significant advantages. My wrench enables a gripping action which far exceeds those of the more conventional wrenches and at the same time may be conveniently operated. The use of an arm which contains one of the jaws of the wrench and which is reciprocally and at the same time pivotally mounted to the body of the wrench enables outstanding gripping

action and convenient use. The use of a threaded fastener member at the end of the arm to drive the arm in its reciprocal movement enables convenient adjustment of the jaws, while the use of the trigger mechanism provides increased gripping capabilities. The jaws need not be set exactly on the workpiece, for the trigger may be used to accomplish the final engagement. Also, the use of the trigger may be used to instantaneously increase the distance between the jaws, a convenient feature when it is desired to ratchet the jaws from face to face on polygon shaped bolt heads. As shown in FIG. 3, my wrench has a vice-like gripping capability which is effected by use of the threaded fastener to move the arm in a direction to forcefully urge the jaws together.

While I have shown my invention in only one of its forms, it should be apparent to those skilled in the art that it is not so limited but is susceptible of various changes and modifications without departing from the spirit thereof.

I claim:

1. A wrench comprising an elongated wrench body having a jaw formed on one end and a threaded aperture formed on the opposite handle end, with said aperture and said body being substantially parallel; a threaded fastener member rotatably carried by said threaded aperture; carriage means secured to said body for reciprocal movement and for transverse movement with respect to the longitudinal axis of said body; an arm member extending along the substantial length of said body and having one end region secured to said carriage means, with said end region having a jaw rigidly formed thereon to oppose the jaw of said wrench body and with the opposite end region of said arm being pivotally and rotatably secured to one end of said fastener member; biasing means mounted between said body and said arm to urge the jaw thereof transversely away from said wrench body.

2. The wrench defined by claim 1 wherein a trigger is pivotally mounted to said wrench body and said arm at respective pivot points, with one end portion extending toward the handle end of said wrench body for movement by the user to urge the jaw of said arm toward said wrench body and the jaw thereof.

3. The wrench defined by claim 1 wherein the jaw of said wrench body is narrower in width than the jaw of said arm to enable edges of both jaws to lie flush with

a plane when the handle end of said wrench body is raised slightly from the plane.

4. The invention defined by claim 1 wherein said jaws have teeth formed on surfaces extending at an obtuse angle measured from the handle end of the body, with the jaw of said arm adapted to move toward the jaw of said body when the arm pivots toward the body.

5. A wrench comprising an elongated wrench body having a jaw formed on one end and a threaded aperture formed on the opposite handle end, with said aperture and said body being substantially parallel; a threaded fastener member rotatably carried by said threaded aperture; carriage means secured to said body for reciprocal movement and for transverse movement with respect to the longitudinal axis of said body; an arm member having one end region secured to said carriage means, with said end region having a jaw rigidly formed thereon to oppose the jaw of said wrench body and with the opposite end region of said arm being pivotally and rotatably secured to one end of said fastener member; biasing means mounted between said body and said arm to urge the jaw thereof transversely away from said wrench body; and a trigger pivotally mounted to said wrench body and said arm and respective pivot points, with one end portion extending toward the handle end of said wrench body for movement by the user to urge the jaw of said arm toward said wrench body and the jaw thereof.

6. The wrench defined by claim 5 wherein the jaw of said wrench body is narrower in width than the jaw of said arm to enable edges of both jaws to lie flush with a plane when the handle end of said wrench body is raised slightly from the plane.

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