Nov. 16, 1937. G. W. FIELDS 2,099,601

RATCHET WRENCH

Filed March 7, 1936

Fig. 1.

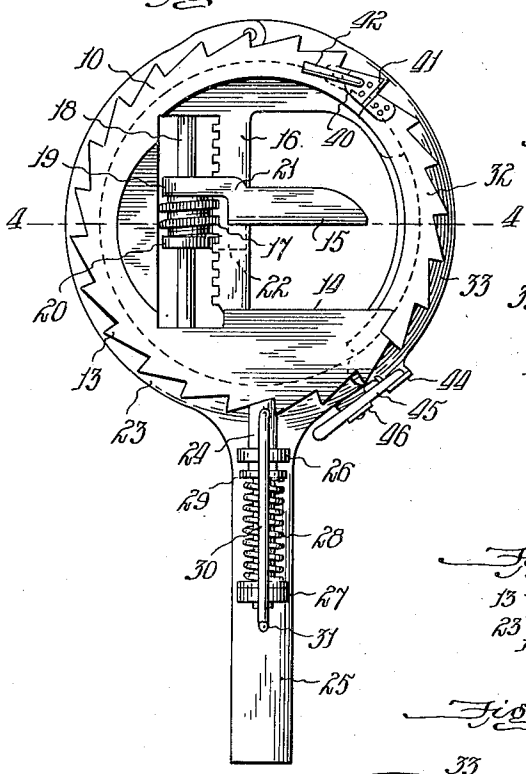


Fig. 2.

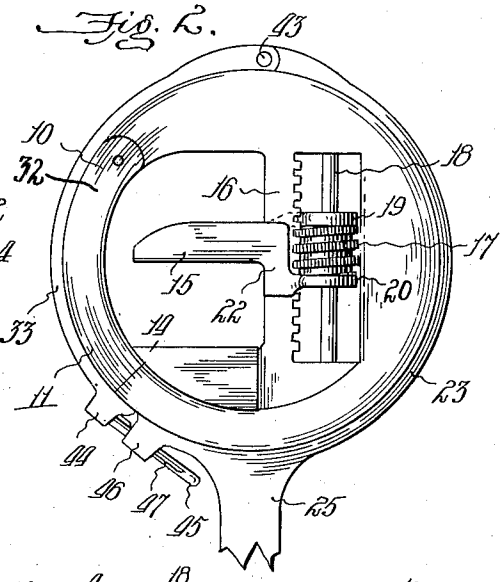


Fig. 4.

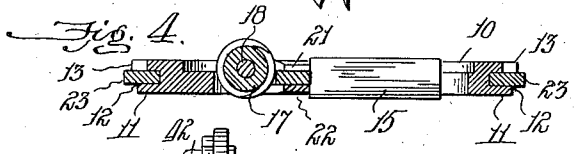


Fig. 5.

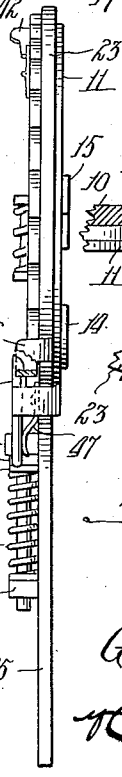


Fig. 6.

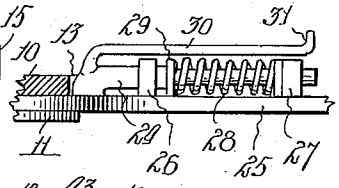


Fig. 3.

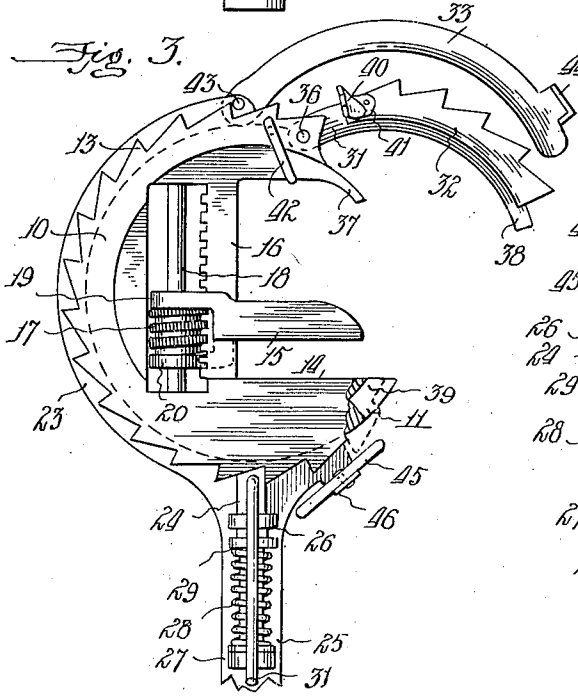
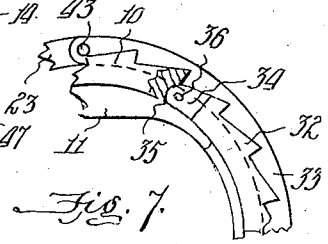


Fig. 7.



Inventor

George W. Fields.

Connee & Peall

Attorney

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RATCHET WRENCH

George W. Fields, Atlanta, Ga.

Application March 7, 1936, Serial No. 67,726

1 Claim. (Cl. 81—60)

My invention is an improvement in ratchet wrenches of that special type in which the nut engaging body portion is provided with a ratchet wheel cooperating with a spring-actuated sliding pawl carried by a ring turnable on said body portion and having a handle for manipulating the same in the operation of the wrench.

In the use of a wrench for tightening or removing a nut it sometimes happens that the nut is so located with respect to adjoining parts that it is necessary to move the wrench laterally into engagement with the nut so that the latter will enter the jaws between the outer ends thereof instead of from one side, and the principal object of my invention therefore is to provide a ratchet wrench of this general character that will permit of its being used in various situations of the nut or head of the bolt, in the present instance by providing for opening one side of the wrench in affording access to the outer ends of the jaws.

A further object of my invention is to provide a ratchet wrench of this type in which one of the jaws is adjustable to accommodate the wrench for nuts of various sizes, and in which the several parts are so constructed and arranged as to insure durability as well as facilitate operation.

With these principal objects in view my invention comprises a ratchet wheel formed integral with a sliding jaw wrench in association with a ring rotatable on the ratchet wheel and having a spring-actuated pawl engaging the ratchet teeth, a segment of both the ratchet wheel and ring being each hingedly connected at one end for outward swinging movement in permitting access to the outer ends of the jaws, together with means for securely locking the segmental portions in closed position, as hereinafter particularly described and more specifically set forth in the appended claim.

In the drawing forming a part of this specification:

Figure 1 is a front elevation of a ratchet wrench constructed in accordance with my invention.

Fig. 2 is a rear view.

Fig. 3 is a front elevation with the segmental sections at one side of the wrench swung to open position for access to the jaws.

Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 1.

Fig. 5 is an edge view of the wrench.

Fig. 6 is a detail view of the spring-actuated sliding pawl carried by the handle, and

Fig. 7 is a detail view illustrating a slight modification of the hinged connection for the segmental portion of the ratchet wheel.

In carrying out my invention the main or body portion of the wrench is in the form of a ratchet wheel 10 enlarged at one side to provide an auxiliary rim 11 (see Figs. 2 and 4) with a peripheral groove 12 therein adjoining the ratchet teeth 13, and within this ratchet wheel the gripping jaws 14 and 15 are located. The jaw 14 is an integral part of the ratchet wheel while the jaw 15 is slidable to and from the same, and for this purpose it is mounted on a rack bar 16 which may be also formed integral with the ratchet wheel. The sliding jaw is adjustable in the usual manner by means of a rotatable adjusting screw 17 mounted on a spindle 18 and interposed between members 19 and 20 also slidable on the spindle and connected to the movable jaw at opposite sides of the rack bar by short arms 21 and 22, whereby said sliding jaw 15 cooperates with the fixed jaw 14 in gripping the nut between them, and although I have shown the opposing faces of the jaws as plain for operation on a nut or other squared object it will be understood that the faces may be serrated for engaging round surfaces when it is desired to provide a pipe wrench.

For turning the ratchet wheel having the gripping jaws a flat ring 23 is rotatably mounted in the peripheral groove 12 and carries a spring-actuated sliding pawl 24 in normal engagement with the ratchet teeth, and for turning the ring it is provided with a handle 25 extending from one side of the same. As will be noted the sliding pawl is mounted on the shank of the handle in spaced bearings 26, 27, with the helical spring 28 interposed between the bearing 27 and a washer 29 at the inner end of the enlarged portion or head of the pawl, whereby the pawl will be projected into engagement with the ratchet teeth to ride over the same when the ring is turned in one direction—clockwise (Fig. 1)—and will engage the teeth when the ring is turned in the other direction—counterclockwise—for turning the ratchet wheel and nut. For manually retracting the pawl it is provided with a rod 30 extending parallel with its shank and above the bearings in which the pawl is mounted, said rod having an upturned outer end 31 for engagement of a finger in manipulating the pawl.

The ratchet wheel and ring each may be made in one piece, but this requires that in placing the wrench in engagement with the nut it must be slipped over the outer end thereof, and it is therefore an important desideratum of my invention that provision be incorporated for also engaging the nut by a lateral movement of the wrench or from either side thereof. To accom-

plish this a segmental portion, 32, of the ratchet wheel, and a segmental portion, 33, of the ring are each cut out and hinged at one end to the ratchet wheel and ring respectively so that they may be opened out, as shown in Fig. 3, the segmental portion or hinged section of the ratchet wheel being adjacent the outer ends of the jaws of the wrench and of such length as to leave an opening corresponding with the full adjustment of said jaws, while the segmental portion of the ring is slightly longer so that it will not interfere with the swinging movement of the segment 32. These segments may be locked in closed position by any suitable fastening means, such for instance as shown in the accompanying drawing and hereinafter particularly described.

For connecting the segment 32 to the ratchet wheel it is reduced at its inner end to form an ear 34 seated in a recess 35 in the ratchet wheel and pivotally connected thereto by means of a pivot pin 36, it being noted by reference to Fig. 3 that a portion, 37, of the ratchet wheel is extended in the arc of a circle to limit the inward movement of said segment, and that the outer end of the segment is also reduced in thickness, as at 38, to seat in a corresponding recess 39 in the ratchet wheel at one side of the opening formed by the segment. Although the segment 33 of the turnable ring will hold the segment 32 in closed position when said segment of the ring is locked in closed position, as hereinafter described, I may employ a metal piece 40 to fill in the gap between the inner enlarged end of the segment and the adjoining portion of the ratchet wheel, said metal piece being connected by hinge 41 and when in locked position, as shown in Fig. 1, it is held in place by a turn-button 42 pivoted to the ratchet wheel.

The segment 33 of the turnable ring is pivotally connected to the main part of the ring by pin 43, and for locking it in closed position it is provided at its outer end with an upturned metal extension 44 with which engages a spring-actuated catch 45 on the adjoining portion of the ring, said catch being pivoted to an upturned extension 46 of the ring. As shown in Fig. 5 the catch is actuated to engage the upturned extension on the segmental portion of the ring by means of a flat spring 47 secured to the extension 46 and bearing against the under side of the catch near the outer end thereof, and for convenience in operating said catch it is located near the inner end of the handle.

In using the wrench it will be obvious, by reference to the accompanying drawing, that in first adjusting the wrench to fit the nut to be turned the sliding jaw 15 is adjusted on the rack bar to or from the fixed jaw 14 by turning the milled adjusting screw 17, and when the situation of the nut is such as to permit the wrench to be passed over the end thereof the segments of the ratchet wheel and ring are in locked position for turning the ring in operating the wrench in the usual manner of ratchet wrenches—the spring-actuated pawl escaping over the ratchet teeth when the ring is turned in one direction and engaging the teeth when the ring is turned in the other direction for turning the nut. As hereinbefore explained the wrench may be adapted for use as a pipe wrench by simply serrating the opposing faces of the jaws, and in this case it is of course desirable that one side of the wrench be opened so that it can be passed over the pipe. In this instance and when the nut is so located as to require that the wrench be engaged therewith by a lateral movement the segmental portions of the ratchet wheel and ring are swung to open position, as shown in Fig. 3, it being necessary only to depress the catch 45 to disengage it from the upturned metal piece 44, and when the segment of the ratchet wheel is held in closed position by the hinged metal piece 40 this metal piece is swung open as shown in Fig. 3 after releasing the turn-button. It will be seen, therefore, that my improved form of ratchet wrench is well adapted for use in manipulating nuts or engaging the ends of bolts under various conditions, and that the particular construction and arrangement of parts constituting the wrench provide a very desirable structure as well as an implement of this general character to facilitate operation on a nut, pipe, or other object it is desired to turn, and though I have hereinafter specifically stated the claim on which I wish to base patent protection it will be understood that modifications or changes may be made within the spirit and scope of said claim.

I claim:—

A ratchet wrench comprising a ratchet wheel with a fixed jaw and an adjustable jaw for engaging the object to be turned and having a peripheral groove alongside of the ratchet teeth, a ring turnable in the groove and having a handle formed integrally therewith, a segmental portion of the ratchet wheel and ring, respectively, being cut out to provide an opening at one side of the wrench leading to the jaws, said segmental portions being hinged at one end to the ratchet wheel and ring respectively, means for locking the segmental portions in closed position, spaced apart apertured lugs on the handle of the turnable ring, a spring actuated pawl slidable in the lugs to engage the ratchet wheel, and an operating rod attached to the pawl and extending longitudinally of the handle, the outer end of said operating rod being turned upwardly adjacent the outer or gripping portion of the handle for convenience in releasing the pawl.

GEORGE W. FIELDS.