

W. W. CASE.
WRENCH.

APPLICATION FILED SEPT. 22, 1909.

974,121.

Patented Nov. 1, 1910.

Fig. 1.

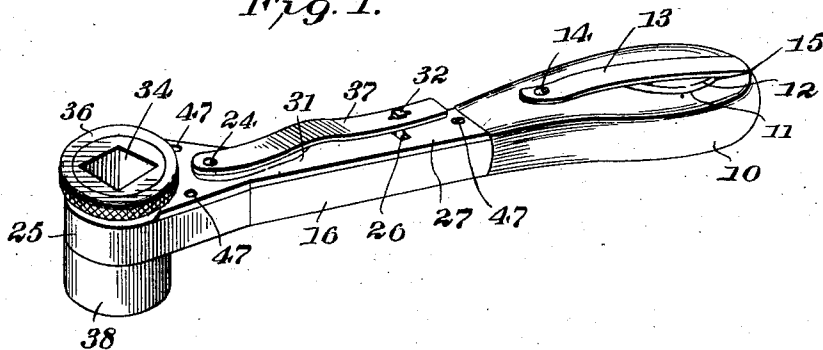


Fig. 2.

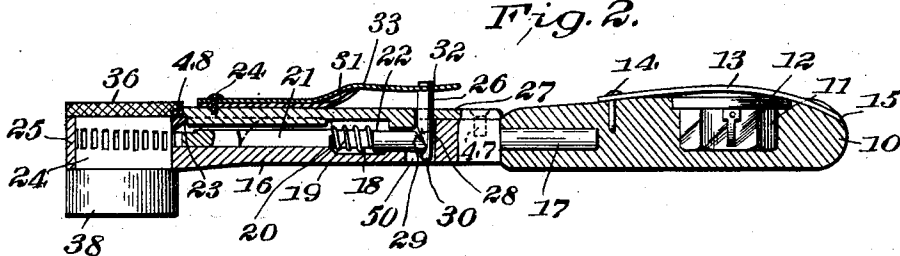


Fig. 3.

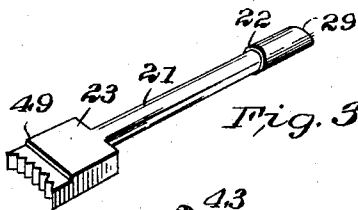


Fig. 4.

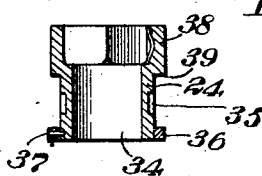


Fig. 6.

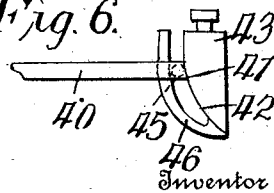


Fig. 7.

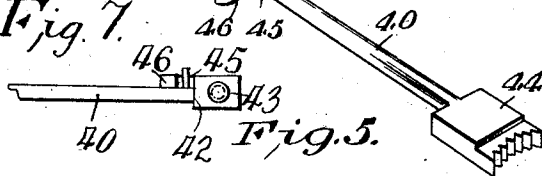


Fig. 5.

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Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM W. CASE, OF KNOWLES, CALIFORNIA.

WRENCH.

974,121.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM W. CASE, citizen of the United States, residing at Knowles, in the county of Madera and State of California, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to wrenches, and has particular reference to that class of wrenches which are known as "ratchet wrenches."

An object of this invention is to construct an improved means for locking the head of the wrench to the handle thereof when it is desired to rotate the head by the swinging of the handle and also in the provision of means whereby the head may be released from the handle upon the end of a stroke of the handle in a quick and efficient manner so as to permit of the quick vibration of the head and operation of the handle.

Another object of the invention is to construct a wrench which is so formed that the head is automatically engaged with the handle upon the grasping of the handle whereby no special operating means is necessary to lock the wrench during the use of the same.

The invention further contemplates the provision of a means for positively feeding a rack against the head in order to lock the head from rotation relative to the rack by the engagement of the hand of the operator with the handle of the wrench.

The invention has for a still further object the provision of a wrench which is strong and durable, which comprises but few operative parts, and which has the parts so arranged as to admit of strength and the formation of firm and large gripping surfaces to support the operative parts thereof from rotation when it is so desired, and to be capable of withstanding great strain in the employment of the same.

For a full understanding of the invention, and the merits thereof, and also to acquire a knowledge of the details of construction, and the means for effecting the result, reference is to be had to the following description, and accompanying drawings, in which;

Figure 1 is a perspective view of the complete wrench; Fig. 2 is a longitudinal section through the same; Fig. 3 is a detail perspective view of the locking member employed; Fig. 4 is a section taken longitudinally through the head; Fig. 5 is a detail

perspective view of the locking member and vibrator disclosing a slight modification in the construction of the same. Fig. 6 is a detail, disclosing a side elevation of the vibrator and the locking member. Fig. 7 is a top plan view of the same.

Corresponding and like parts are referred to in the following description, and indicated in all the views of the accompanying drawings by the same reference characters.

Referring to the drawings, the numeral 10 designates a handle which is preferably formed of wood, and which is of any desirable shape to conform to the hand of the operator. The handle 10 is preferably provided with a recessed portion 11 in one face thereof for the reception of a socket reducer 12, which is adapted for engagement in the head to reduce the size of the opening of the same in order to adapt the wrench for various uses. The handle 10 is further provided with a leaf spring 15 which is pivotally mounted upon a pin 14 upon the face of the handle 10; the leaf spring 13 being adapted for engagement over the recessed portion 11 to retain the member 12 therein. The leaf spring 13 is retained from sliding movement through the medium of a depression 15 which is formed in the outer end of the handle 10 and into which the outer extremity of the leaf spring 13 is tensionally retained.

The shank of the wrench comprises an elongated shank member 16 which is provided with an integrally formed stud 17 for engagement in the end of the handle 10 in order to support the same. The shank 16 is provided with a recess 18 for the reception of a coiled spring 19 which is adapted to expand therein and to engage against a shoulder 20 formed within the bore of the shank 16 at one end of the recess 18. The coiled spring 19 is engaged about a locking member 21 which is formed of an elongated bolt which is enlarged at its rear extremity to form an annular shoulder 22, against which the free end of the spring 19 is engaged for the purpose of forcing the bolt 21 away from the ratchet head 24. The forward end of the bolt 21 is provided with a rack 23 having a concave face to conform to the outer surface of a rotary head 24 mounted in a ring 25 formed upon the outer end of the shank 16.

The means employed for advancing the bolt 21 to cause the rack 23 to engage against

the head 24 comprises a vibrator 26, which is formed of a short bolt which is vertically disposed within the shank 16 and which is projected upwardly through a detachable cap 27 secured upon the shank 16, the vibrator 26 being provided with a cam face 28 for engagement against a cooperating beveled extremity 29 formed upon the inner end of the locking member 21. The lower end of the vibrator 26 is provided with a projection 30 for engagement against the under face of the locking member 21 to limit the upward movement of the vibrator 26 under the action of the leaf spring 31 disposed upon the cover 27. The vibrator 26 is provided upon its upper extremity with a reduced portion 32 for the reception of a strap 33 which is mounted upon the upper face of the cover 27 over the leaf spring 31 through the medium of a screw 34 and is adapted to be normally pressed into an upward position under the action of the leaf spring 31 in order to raise the vibrator 26 normally and to retain the same in such position under normal conditions. The vibrator 26 is off-set at its upper extremity above the reduced portion 32 in order to retain the strap 33 thereupon, and to permit of the upward action of the strap upon the vibrator.

The head of the wrench comprises a circular member which is provided with a rectangular bore 34 for the engagement of nuts of corresponding size therein and also for the reception of stocks or like members which are adapted to be rotated and upon which pressure is to be applied. The head 24 is provided about its periphery with a plurality of teeth 35 which intermesh with the teeth of the rack 23 and serve as a means for locking the head 24 from rotation upon the forward movement of the locking member 21. The head 24 is provided with a ring 36 which is engaged over the end of the same, the head 24 being inserted through the ring 25 secured in such position through the medium of a locking pin 37 or other suitable means.

The opposite end of the head 24 is provided with an enlargement 38 which is provided with a rectangular opening of preferably hexagonal formation to accommodate nuts of hexagonal form or for the reception of the socket reducer 12, to reduce the diameter of the bore or to change the formation of the same. The enlargement 38 forms a shoulder 39 against which one edge of the ring 25 is engaged for the purpose of retaining the head 24 in cooperation with the ring 36 from longitudinal movement through the ring 25.

In the modification of the device in Fig. 5 of the drawings, the locking member 40 is provided with a beveled end 41 for engagement against the cam face 42 of the vibrator

43, in order to impart a forward movement to the locking member 40 to engage the rack 44 against the head of the wrench, and is further provided with a laterally projected stud 45 for engagement against the inner side of lip 46 which is formed upon the lower end of the vibrator 43 and extended upwardly and forwardly therefrom in equidistant relation throughout its length from the cam faces 42 for the purpose of withdrawing the locking member 40 upon the raising of the vibrator 43 under the action of the leaf spring which is carried upon the cover of the shank of the wrench.

The cover 27 of the wrench is preferably detachably secured thereon and it is disclosed in the drawings as being retained in such relation upon the shanks 16 through the medium of screws 47. The outer end of the shank 16 is provided with a rib 48 across its open side for the purpose of limiting the outward movement of the rack 23 by reason of the formation of a shoulder 49 formed across the upper face of the rack 23 adjacent its outer end for engagement against the bead 48 upon the forward thrust of the bolt 21. The side of the shank 16 which is opposite to the cover 27 is provided with an opening 50 positioned in alinement with the vibrator 26 to permit of the reciprocation of the same and of the extension of the projection 30 therethrough upon the inward movement of the vibrator 26.

In operation, the head 24 of the wrench is engaged over a nut, a stock, or the like which is to be rotated and upon which a pressure is to be applied. The operator now grasps the handle 10 and swings the shank 16 about the head to dispose the same to the desired angle when the operator presses the thumb upon the strap 33 and moves the vibrator 26 downwardly whereby the cam face 28 thereof strikes against the beveled end 29 of the locking member 21 and presses the spring 19 to move the bolt 21 forwardly and engage the rack 23 against the teeth 35 formed in the periphery of the head 24 thereby locking the head from rotation and permitting the operator to rotate the head through the action of the handle 10 and shank 16, to exert a leverage upon the nut or stock which is being rotated. At the end of a stroke of the handle 10 the operator raises his thumb and releases the strap 33 whereby the spring 31 raises the strap and draws the vibrator 26 upwardly through the casing to release the beveled end 29 of the locking member 21 and permit of the expansion of the spring 19 to withdraw the rack 23 from the head 24 thereby releasing the same. This action is repeated as many times as is required as the handle is locked to the head upon the depression of the vibrator 26. When the locking member which is disclosed in Fig. 5 of the drawings

is employed, the same operation takes place with the exception that the bolt 40 is retracted under the action of the stud 45 which engages with the lip 46 and thereby retains the beveled end 41 against the cam face 42 to position the bolt 40 normally and ready for a forward thrust when the vibrator 43 is depressed.

Having thus described the invention, what is claimed as new is:

1. A wrench including a shank, a locking member positioned longitudinally in said shank, for reciprocation therein, a vibrator engaged against the rear end of said locking member and transversely positioned through said shank, a cam face formed on said vibrator to advance the locking member, a spring mounted about said locking member and engaged with said shank to normally retract said locking member, a spring positioned upon the outer face of said shank and connected to said vibrator to actuate the same, a rotary head mounted in said shank and teeth formed on said rotary head for engagement with said locking member.

2. A wrench including a handle, a shank carried by said handle, having an elongated channel formed therein, a sliding bolt located in the channel, said channel being enlarged intermediately of its ends, a spring engaged about said bolt and contacting with the end wall of the enlarged portion of the channel, a shoulder formed adjacent the rear end of said bolt, for engagement with the opposite end of said spring, a beveled face formed on the inner end of said bolt, a vibrator engaged through one side of said shank, and with said bolt, a cam face formed on said vibrator for engagement with the beveled face of said bolt, means for normally extending said vibrator outwardly, a projection formed upon the inner end of said vibrator to engage with the end of said bolt to limit the outward movement of said vibrator, a rack carried by said bolt and a head mounted in the outer end of said shank for engagement with the rack at times to lock the head against rotation.

3. A wrench including a shank having a ring formed upon the outer end thereof, a rotary head engaged in the ring having teeth in its periphery, a locking member mounted in said shank for longitudinal movement, a spring carried by the locking member and connected to the shank to normally hold the member out of engagement with said head, and a vibrator slidably mounted in said shank against said locking member and having a cam face to engage against said locking member, and means connected to said vibrator for normally holding the same in a raised position.

4. A wrench including a handle, a shank carried by the handle and having a bore extending practically the entire length thereof, a locking member mounted in the bore for reciprocation therein, a spring carried on the locking member and engaged with said shank to normally retract said member, a vibrator engaged through one side of said shank and having a cam face for engagement against the end of said locking member, a leaf spring secured to the side of said shank and connected to said vibrator for normally holding the same in an outward position, and a head mounted in the outer end of said shank for interlocking engagement with said locking member.

5. A wrench including a shank, a ratchet head mounted in the outer end of said shank, a locking member mounted for reciprocation within the shank to engage the head, a vibrator positioned in one side of the shank, a spring carried by the shank for normally holding the vibrator in an outward position, a cam face formed upon the inner end of the vibrator to engage the locking member to move the same at times, and means connected to the locking member for normally retracting the same.

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

WILLIAM W. CASE. [L. s.]

Witnesses:

WM. R. MURRAY,
GEO. F. JACOB.