July 22, 1924. 1,501,903

W. GORDON

WRENCH

Filed June 9, 1922

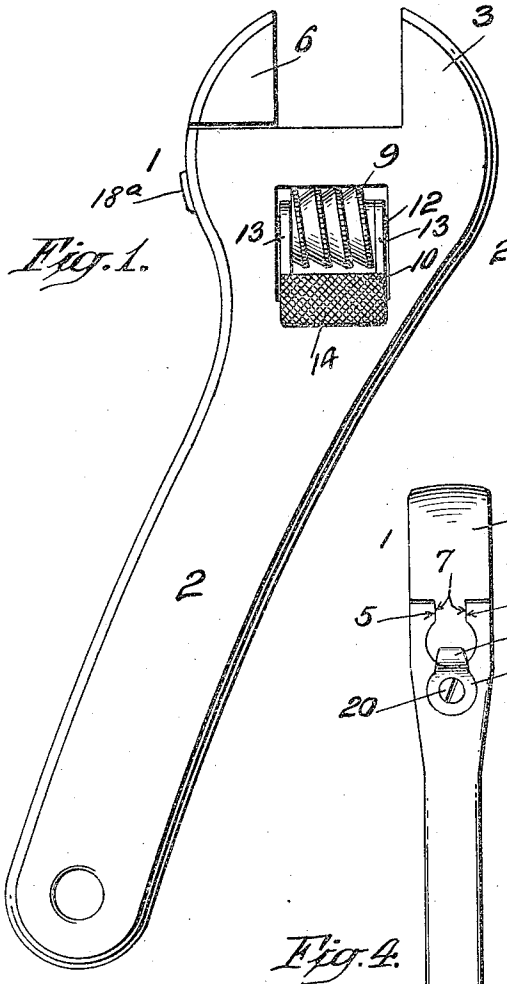


Fig. 1.

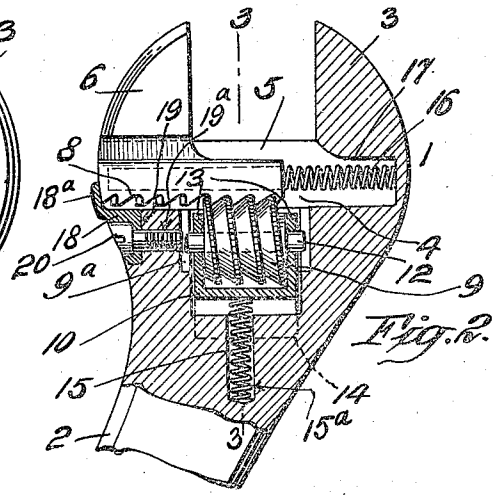


Fig. 2.

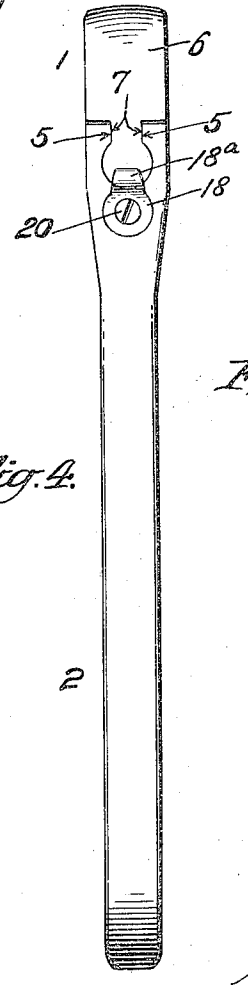


Fig. 4.

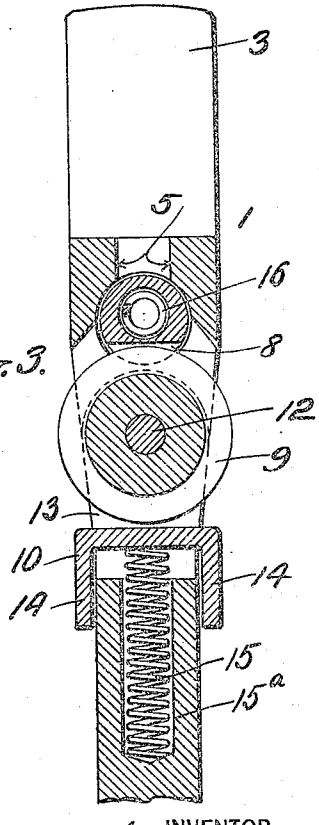


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM GORDON, OF UNION, NEW JERSEY.

WRENCH.

Application filed June 9, 1922. Serial No. 566,933.

To all whom it may concern:

Be it known that I, WILLIAM GORDON, a citizen of the United States, and a resident of the town of Union, county of Hudson, and State of New Jersey, have invented certain new and useful Improvements in Wrenches, of which the following is a specification.

This invention relates to improvements in wrenches, and is particularly an improvement upon the type of wrench shown and described in my former Letters Patent No. 1,407,528 in which one of the jaws is capable of adjusting movement in relation to a fixed jaw by means of a screw having threads suitably disposed and yieldingly retained by spring means in operative engagement with rack-teeth on said movable jaw, and in which a spring is adapted upon the release of the screw from engagement with said rack teeth to instantaneously move the movable jaw into full open position.

One of the objects of this invention is to simplify and improve the construction of said patented wrench and to enable a more facile and positive manipulation and operation of the operating parts thereof.

Another object of this invention is to mount the adjusting-screw pivotally in a spring-pressed carrier which is movable at a right angle to the line of movement of the movable jaw, whereby the engagement of the thread and rack will be more positive and the extent of such engagement will be the same at all times, and the degree of spring pressure with which all parts of the screw are held in engagement with the rack will be equalized.

Another object of this invention is to provide means located intermediate the edges of the wrench and preferably extending to opposite side faces thereof, for pulling the carrier and the screw away from the teeth on the jaw to release the jaw and cause the same to be automatically moved to full open position.

With these and other objects in view, the invention comprises the combination of members and arrangement of parts so combined as to co-act and cooperate with each other in the performance of the functions and the accomplishment of the results herein contemplated, and comprises in one of its adaptations the species or preferred form illustrated in the accompanying drawings, in which:—

Fig. 1 is a side elevation of a wrench embodying my invention;

Fig. 2 is a fragmentary vertical section taken between the opposite flat side faces of the wrench;

Fig. 3 is a section on the line 3—3 of Fig. 2; and

Fig. 4 is an end elevation of the device shown in Figs. 1 to 3.

Referring now to these drawings, which illustrate a preferred embodiment of my invention, 1 indicates the head of a wrench having, as illustrated, an integral handle 2 and stationary jaw 3 and also provided with a cavity 4, the walls of which are provided with oppositely arranged ways 5 in which a movable jaw 6 is adapted to slide toward and away from the stationary jaw 3 so as to permit the gripping of an object between such jaws.

Said jaw 6 is, as illustrated, provided with side grooves 7 cooperating with the ways 5 to permit the inward and outward sliding thereof relatively to the stationary jaw 3, and said jaw is furthermore provided at its rear edge with a rack 8 preferably having, as shown, teeth inclined rearwardly, which are normally retained in operative engagement or in mesh with an adjusting or actuating worm or screw 9 having a thread which is inclined in the opposite direction to said rack-teeth. Obviously the rotation of the worm or screw 9 in one direction will cause the movable jaw to approach the stationary jaw or move from open to closed position, while rotation of the said worm or screw in the opposite direction will cause an opposite or opening movement thereof.

It is desirable to produce a wrench which will be strong, durable and simple in construction and operation, without any projecting operating parts and which is capable of an instantaneous opening to full-open position of the jaws, a quick initial adjustment for the purpose of approximately fitting the objects, such as nuts, pipes and the like, on which it is desired to operate and also a fine adjustment for the purpose of finally tightening up upon such object. I therefore provide a spring-pressed carrier 10 for the screw 9 which is movable at substantially a right angle to the rack on the

movable jaw 6. By means of this carrier all portions of the screw may simultaneously be readily and quickly released from engagement with said rack so as to permit independent and quicker manipulation than would be possible by means of such screw adjustment. At the same time positive engagement is maintained of all parts of the thread of said screw with the rack under equal tension. I furthermore provide spring means operable upon the release of the jaw 6 from such actuating screw 9 for automatically moving the movable jaw to full open position. My spring pressed carrier enables the entire thread on the screw during a closing movement of the wrench, to be normally retained in such yielding contact with a rack on the jaw that the movable jaw may be automatically moved from open to closed position by direct contact without operation of the screw-disengaging device, and the teeth of the rack will be caused to click over the screw thread which will act as an elongated retaining pawl therefor and will positively and automatically latch or lock the jaw in an approximate nut engaging position after which the same may be quickly tightened up or finally adjusted by the rotation of the said screw. As illustrated, the screw-carrier 10 and screw 9 are mounted in an opening 9^a in the head 1 and the carrier is arranged to be movable away from the rack to move the screw 9 out of engagement or contact with said rack 8 so as to release the jaw 6 from the locking engagement of said screw.

In the preferred embodiment of my invention, the screw 9 is rotatably mounted upon a spindle 12 which is pivotally mounted at its opposite ends in the end walls 13 of the carrier 10 which is seated in said opening 9^a which extends transversely through the head 1 so as to be engageable by the fingers of the operator at opposite side faces of the wrench. The lower end of the carrier is provided at opposite sides with finger pieces 14 embracing the edges of the opening in the head and these finger pieces are operable to move longitudinally on the opposite sides of said head and intermediate the opposite edges thereof and move the carrier and screw longitudinally and at right angles to the path of movement of the rack 8 and out of engagement therewith, so as to release the jaw 6. The carrier 10 is preferably yieldingly forced toward the rack by means of the spiral spring 15 which, as illustrated, is seated in a bore 15^a in the wrench body and abuts at one end on the carrier and at its opposite end against the bottom of the bore. The screw 9 which, as aforesaid, is rotatably mounted on the spindle 12 in the carrier is thus yieldingly held in engagement with the rack 8. It will be obvious that upon applying closing pressure on the jaw 6, the teeth of the rack 8 will automatically force the spring-pressed screw 9 and carrier 10 to move outwardly at a right angle and the teeth of such rack will click over the thread of said screw and will automatically lock the jaw against movement in the opposite direction.

When it is desired to procure a quicker opening of the jaw than is required by the rotation of the screw 9, a pressure on the finger pieces 14 of the carrier against the action of the spring 15 will cause an immediate and positive freeing of the screw from engagement with the rack, and the jaw 6 may then obviously be opened and if the wrench is held in one plane will be automatically moved by gravity into open position. It is desirable, however, in order to secure quick manipulation, to cause the said jaw upon the freeing of the rack as aforesaid to be moved to full open position automatically while the wrench is in any position, and for this purpose I provide a jaw-opening spring 16 which, as illustrated, is seated at one end in a socket 17 in the jaw 6 and has its opposite end bearing against the inner wall 4^a of the cavity 4. This spring 16 not only automatically forces the jaw 6 into full open position when the rack teeth are released from engagement by the screw 9, but will also, when contact is made by the carrier-pressing spring 15, resiliently force the teeth of the rack 8 into intermeshing engagement with the thread of the screw 9 and thus assist in the positive retention and automatic locking of the jaw 6 in any desired position to which it is moved as hereinabove described.

In assembling the parts the spring 15 is first placed in the socket 15^a, the carrier is placed in its cavity, the screw is then positioned in proper alignment in the carrier and the spindle 12 is passed through enlarged and reduced bores 19—19^a in registry with the bearing apertures in the carrier and the bore of the screw. The spring 16 and jaw 6 are then placed in their assembled positions shown in Fig. 2 and the jaw 6 is locked in position by means of a block 18 having a limiting stop 18^a which engages the rear end of the jaw 6 at its opening limit of movement. The block 18 is held in position by a screw 20 which meshes with a screw thread in the reduced bore 19^a.

The operation of the wrench will be obvious from the above description.

Having described my invention, I claim:—

1. In a wrench, a suitable handle, jaws, one of which is movable relatively to the other, a rack on said movable jaw, a carrier mounted adjacent to the rack and movable away from said rack at substantially a right angle thereto; a screw rotatably mounted in said carrier, a spring for forcing said screw into contact with the rack, and a spring for

automatically moving said jaw to full open position upon a releasing movement of said carrier and screw, and also applying pressure on the jaw to force the teeth of the rack into engagement with the threads of the screw.

2. In a wrench, a suitable handle, jaws, one of which is movable relatively to the other, a rack on said movable jaw having teeth inclined to the surface thereof, a carrier mounted adjacent to the rack and movable away from said rack at substantially a right angle thereto; a screw rotatably mounted in said carrier and having threads projecting in a direction inclined to the axis of the screw and adapted to have an interlocking engagement with the teeth of the rack, a spring for forcing said screw into contact with the rack, a spring for automatically moving said jaw to full open position upon a releasing movement of said carrier and screw, said spring also applying pressure on the jaw to force the teeth of the rack into engagement with the threads of the screw, and operating means located intermediate the edges of the wrench head for moving said spring-pressed carrier to release the screw from engagement with the rack.

3. In a wrench, a suitable handle, a head, jaws, one of which is movable relatively to the other in said head, a rack on said movable jaw having teeth inclined to the surface thereof, a carrier mounted in said head adjacent to the rack and movable away from said rack at substantially a right angle thereto; a screw rotatably mounted in said carrier and having threads projecting in a direction inclined to the axis of the screw and adapted to have an interlocking engagement with the teeth of the rack, a spring for forcing said screw into contact with the rack, a spring for automatically moving said jaw to full open position upon a releasing movement of said carrier and screw, said spring also applying pressure on the jaw to force the teeth of the rack into engagement with the threads of the screw, and knurled finger-gripping pieces connected with the carrier and extending to opposite sides of the wrench head and located intermediate the side edges thereof for moving said spring-pressed carrier to release the screw from engagement with the rack.

In witness whereof, I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

WILLIAM GORDON.

Witnesses:
HELEN V. WHIDDEN,
JULIUETT LUTZ.