Nov. 5, 1940. R. L. SHEETZ 2,220,354

MAGAZINE WRENCH

Filed April 18, 1940

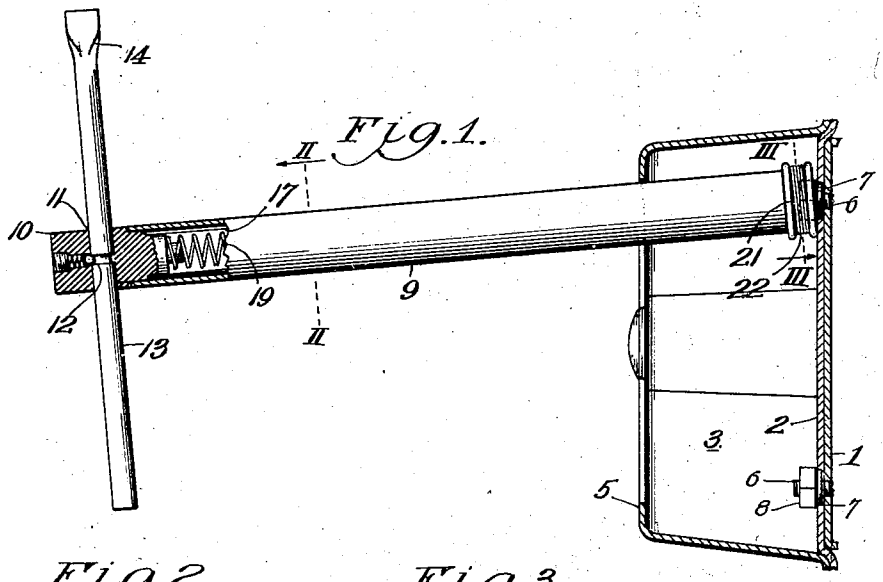


Fig. 1.

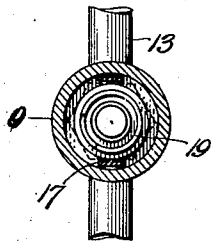


Fig. 2.

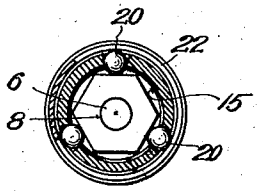


Fig. 3.

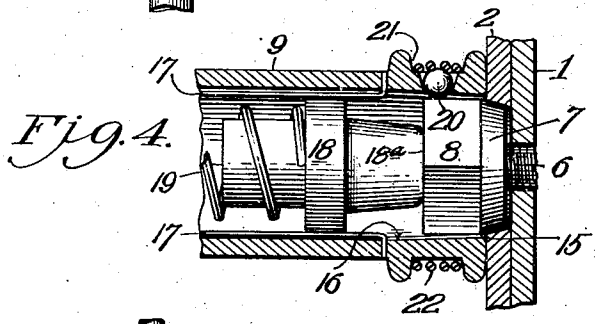


Fig. 4.

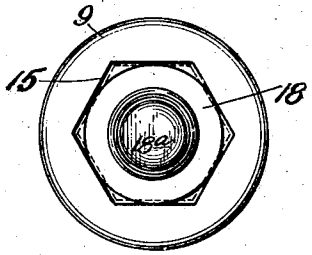


Fig. 5.

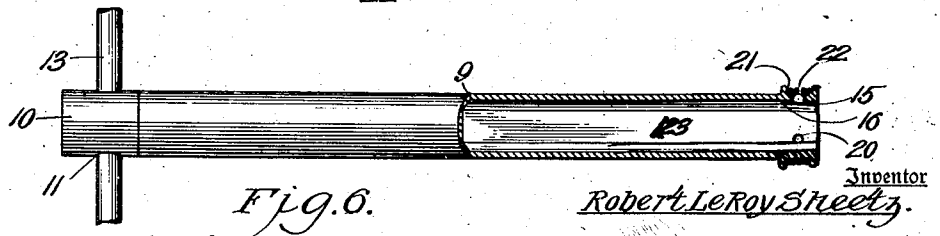


Fig. 6.

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Patented Nov. 5, 1940 2,220,354

UNITED STATES PATENT OFFICE

2,220,354

MAGAZINE WRENCH

Robert L. Sheetz, Independence, Mo.

Application April 18, 1940, Serial No. 330,378

5 Claims. (Cl. 81—125)

This invention relates to magazine wrenches in which a plurality of nuts may be stored as they are removed from position, one of the objects of the invention being to provide a wrench of this character having socket means of such nature that the axis of the nut and the axis of the tool may be varied so that the axis of the nut may be alined with a bolt where it is impossible, on account of obstructions, to bring the axis of the tool into alinement with the axis of the bolt. This difficulty has chiefly been found in connection with the construction of some demountable wheels, where it is frequently impossible to get the tool into exact alinement.

A further object of the invention is to produce a socket construction of the general character outlined which is provided with resilient means which will maintain an unrestrained nut in alinement with the tool, without the use of bulky external attachments which would interfere with the use of the tool in a confined space.

A still further object of the invention is to produce a magazine wrench provided with a series of internal guide strips or members which will hold the stored nuts in axial alinement and against independent rotation, so that they may always be fed in proper relation to the socket or operating end of the barrel or magazine compartment.

Another object of the invention is to produce a wrench of the general character outlined of strong, durable, efficient and inexpensive construction, and in order that it may be fully understood, reference is to be had to the accompanying drawing, in which:

Figure 1 is a section through a portion of a demountable wheel indicating the tool applied thereto at an angle to the axis of a wheel securing bolt.

Figure 2 is an enlarged section on the line II—II of Figure 1.

Figure 3 is a section on the same scale as Figure 2, taken on the line III—III of Figure 1.

Figure 4 is an enlarged fragmental longitudinal section of the bolt-engaging end of the tool and showing the same applied to a nut and coaxially disposed with relation to the nut and bolt.

Figure 5 is an end view of Figure 4 with the nut shown in dotted lines.

Figure 6 is a view partly in side elevation and partly in longitudinal section, the body portion constituting a tube which is internally hexagonal in cross-section.

In the said drawing, where like reference characters identify corresponding parts in all of the figures, 1 indicates the face of the axle drum of a motor car, 2 the plate or securing portion of a demountable wheel which is adapted to be secured to the drum portion 1, 3 the hub portion of said wheel to which the spokes are attached, and 5 the hub stiffening and covering plate securing flange of the hub.

The wheel plate 2 is provided with a series of openings adapted to be received on a series of spaced stud bolts 6 projecting from and carried by the axle drum 1. As the wheel must not only be secured, but also alined, the openings in the plate 2 are contoured to receive conical portions 7 of securing hexagonal shaped nuts 8. It will be understood that the nuts may be of any shape, and that the tool is correspondingly shaped, and of sufficient diameter to receive the nuts.

Referring to Figures 1 and 4, it will be noted that the relation of the axis of the securing bolts 6 to the cover plate retaining flange 5 of the hub, is such that a magazine wrench cannot be alined with any of said bolts, but must be applied at an angle thereto. The tool of the invention is, therefore, constructed as follows:

9 is a cylindrical barrel of sufficient length to accommodate any desired number of nuts, by preference at least as many as are required to retain one wheel and a spare wheel in position. The bore of the barrel 9 is of sufficient size to receive the nuts. One end of the barrel 9 is closed by a plug 10 having a cross passageway 11, and being equipped with a spring-advanced ball 12 intersecting said passageway. To provide a handle for the tool, a bar 13 is projected through the passage 11 and is held by frictional engagement of the ball 12. One end of this bar may be formed in a wedge-shaped portion 14 which may be conveniently employed in removing the cover plates usually used with the type of demountable wheels illustrated.

Welded or otherwise secured to the other end of the barrel, or made integral therewith, is a hexagonal socket (the socket being internally shaped according to the shape of the nuts with which it is to be used), having its outer end 15 of such internal size and contour as to snugly fit over the nuts with which the tool is to be used, and the internal length of said socket being at least as long as the overall length of a nut. The socket is enlarged rearwardly as at 16 so that a nut may rock at its rear end within the socket. One convenient means of providing such an enlarged chamber for the rocking of the nut, is to progressively increase the internal diameter of the socket from the operating end to the opposite end thereof as illustrated in Figure 4. With a socket of this character and with the tool positioned with its longitudinal axis in a horizontal plane, it will be apparent that a loose nut would normally rest against the bottom wall of the socket, with its longitudinal axis consequently extending at an angle to the axis of the socket end of the barrel.

With a barrel having a cylindrical bore, means

must be provided to prevent the nuts from rotating within the barrel, as they may become jammed by the expelling means within the socket, as will hereinafter appear. To provide such a retaining means, the outer ends of a pair of guide strips or straps 17, arranged on opposite sides of the barrel to embrace the opposite faces of a nut, are inserted and welded between the abutting ends of the socket and of the barrel. The opposite ends of said guide strips are secured in any suitable way between the plug 10 and the proximate portion of the barrel or tube 9.

Slidingly fitted within the barrel is a follower 18 having a nut engaging portion 18a so made that the rear end of a nut can shift its position on the face of the portion 18a in order to center itself at its rear end with a bolt, as will hereinafter appear, without throwing the front end of the nut out of line. For expelling the nuts, the follower 18 is under the pressure of a spring 19, which abuts the plug 10 at its opposite end. To prevent the nuts from becoming jambed in the socket, to guard against the accidental expulsion of the nuts from the tool, and to insure that, under normal conditions, the axis of the nut shall be alined with the axis of the tool, the following mechanism is provided: The socket adjacent its out end is provided with a plurality of equi-spaced balls 20 fitting in openings in the socket with one side intersecting the bore of the socket and their other sides projecting into a groove 21 in the external periphery of the socket. Encircling the socket and entirely within the groove 21 thereof is a coiled spring 22 which yieldingly presses said balls toward the axis of the socket.

Figure 6 illustrates a construction corresponding in all particulars to that above described, except that the internal bore 23 of the barrel is of contour to hold the nuts against rotation. The internal bore of the drawing is shown as hexagonal to avoid the use of the guide strips 17 of Figures 1 to 5.

Operation

Assuming that the magazine is charged with a plurality of nuts 8, the foremost nut will be held by the force of the spring 19 applied to the follower and the preceding nuts, pressed against the retaining balls 20. The nut will consequently be held with the axis of its threaded bore in the longitudinal axis of the tool. The operator will now approach the tool, in angular relation (as shown in Figure 1), if it cannot be applied in alinement, to the bolt on which the first nut 8 is to be threaded, and will thrust the tool forwardly without rotating the same, until the end of the socket comes into abutment with the face of the plate 2. During this movement, the bottom edge of the bore of the first nut 8 will have contacted the bottom edge of the bolt 6, and the nut will have been caused to rock within the socket 16 so that its threaded bore comes into alinement with the bolt 6. This will be true regardless of the position of the threads on the bolt and nut, since the nut is held centered in the socket by the three spring advanced balls 20. The operator may now commence to rotate the tool and the nut will properly mesh with the bolt threads. It will be noted that as the small end 15 of the socket 16 snugly embraces the nut, it will not be possible for the socket to rotate around the nut. A nut is removed by reversing the operation above described, and it will be evident that each succeeding nut presses the preceding nuts into the magazine against the action of the spring 19. The final nut 8 is held against expulsion by the fact that the balls 20 intersect or project into the bore of the socket, as common in devices of this kind.

From the above description, it will be apparent that while I have described and illustrated what now appears to be the preferred construction, it is to be understood that I reserve the right to all changes properly falling within the spirit and scope of the invention and without the ambit of the prior art.

I claim:

1. In a magazine wrench, a barrel adapted to receive and retain a plurality of nuts, one end of said barrel having a nut-engaging socket having its operating extremity of size to snugly embrace a nut and being expanded rearwardly to permit a nut to rock in the socket, and means adjacent the end of the socket portion yieldingly holding such nut against rocking so that the nut shall normally have its axis alined with the axis of the barrel.

2. In a magazine wrench, a barrel adapted to receive and retain a plurality of nuts in axial alinement, means in association with the barrel to hold the nuts against independent rotation, a socket at one end of and axially alined with the barrel, said socket having its outer end of contour to snugly embrace a nut and progressively increasing in diameter to its other end to permit a nut to rock in the socket, and means in said socket for yieldingly overcoming the tendency of a nut to rock in order to normally maintain such nut with its axis coinciding with the axis of the barrel and socket.

3. In a magazine wrench, a barrel adapted to receive and retain a plurality of nuts, resilient means in said barrel for expelling said nuts, one end of the barrel having a nut-engaging socket having its outer extremity of size to snugly embrace a nut and from said end being expanded rearwardly to permit a nut to rock in the socket, and means carried by the socket portion adjacent its outer extremity for yieldingly restraining the ejection of nuts by said expelling means and for cooperating with the expelling means in holding a nut against rocking movement.

4. In a magazine wrench, a barrel adapted to receive and retain a plurality of nuts in axial alinement, means in said barrel for expelling said nuts, a socket at one end of the barrel, said socket having its outer end of contour to snugly embrace a nut and progressively increasing in diameter rearwardly to permit a nut to rock in the socket, and means in said socket for normally cooperating with the expelling means for yieldingly maintaining a nut against rocking movement and with its axis coinciding with the axis of the barrel and socket, said means comprising a spring externally encircling the socket, and a series of equi-spaced balls projecting into the bore of the socket and advanced by said spring.

5. A wrench having a body portion with one end forming a nut-engaging socket having its operating extremity of size to snugly embrace a nut and being expanded rearwardly from such end to permit a nut to rock in the socket, and yielding means carried respectively by the body portion and by the socket extremity for cooperatively yieldingly holding a nut against rocking movement.

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