

May 13, 1958

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2,834,239

FRICTION DRIVE SOCKET WRENCHES

Filed Feb. 8, 1957

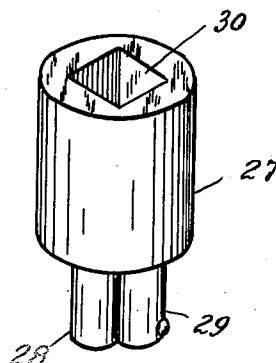
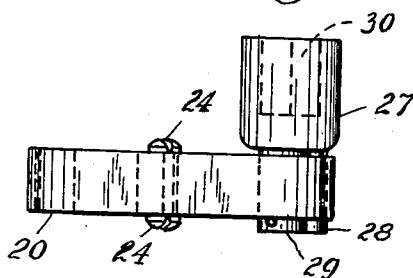
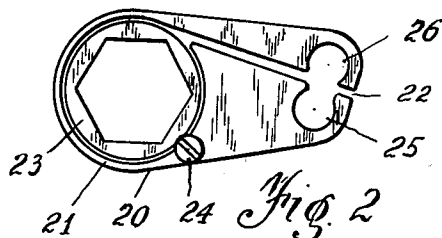
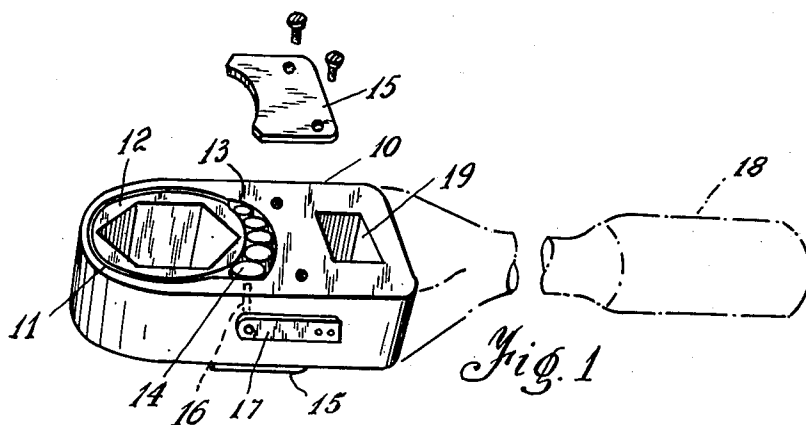


Fig. 4

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2,834,239

FRICION DRIVE SOCKET WRENCHES

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Application February 8, 1957, Serial No. 639,073

1 Claim. (Cl. 81—64)

This invention relates to wrenches and particularly to friction drive socket wrenches.

The use of ratchet wrenches for moving nuts and bolts into engagement or out of engagement is well known. Conventional ratchet wrenches depend however, on many moving parts, such as pawls which tend to become disengaged from one another or to break thereby rendering the ratchet wrench useless. To avoid these difficulties friction wrenches have been proposed, but like the ratchet wrenches, these heretofore proposed wrenches have multiple external levers and pin connectors which tend to jam or break.

An object of this invention is to provide a friction drive wrench free of external exposed levers which tend to break.

Another object of this invention is to provide a friction drive wrench with a thin walled head for use in places where there are close clearances between the nut or bolt being turned and other possible obstruction.

Another object is to provide a friction drive wrench wherein the drive is by means of directional rotation of diminishing sized rollers.

Another object of the invention is to provide a friction drive wrench wherein the drive is by means of parallel shafts separately engaging two ends of a split thin walled head.

Other objects, purposes and advantages of this invention will be apparent from a consideration of the following description and the accompanying drawings in which:

Figure 1 is an isometric view of an embodiment of this invention, partly exploded.

Figure 2 is a top plan view of the friction head and socket according to a second embodiment of this invention.

Figure 3 is a side elevation of the head of Figure 2 with drive member in position, and

Figure 4 is an isometric view of the drive of Fig. 3.

Referring to the drawings there is illustrated a head portion 10 having a circular opening 11 receiving a free spinning socket 12. A cam slot 13 is provided along the circumference of the circular opening 11. The cam slot 13 has an area of diminishing size from one end to the other and carries a plurality of side by side rollers 14 of graded diminishing sizes. A roller retainer plate 15 is provided on each side of the cam slot 13 to hold the rollers in the cam slot. The plate 15 extends above the outer periphery of the socket 12 and acts to retain the socket in opening 11. A roller loading pin 16 extends through the sidewall of the head 10. One end of the pin 16 is fixed to a spring 17 on the head 10 and the other end is in contact with the largest sized roller,

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tending to urge the rollers toward the smallest area of the cam opening or slot 13. A handle 18 may be provided (chain lines) as an integral member of the head 10 may be provided with an opening 19 to receive a drive arm from a conventional socket drive.

In operation the embodiment of Figure 1 acts as follows: The socket 12 is fixed to a nut to be moved and the handle 18 is urged clockwise (viewing Figure 1). This urges the rollers 14 toward the small end of the cam slot 13 wedging them tightly against the socket 12 causing it to move with the head 10. When the handle 18 is moved counter clockwise the rollers move to the large end of the cam slot and release the socket 12 for rotation in the head. The spring 17 and pin 16 urging the rollers toward the small end of cam slot 13 regardless of the position of the head 10 so that the wrench is operative at any angle.

In the embodiment of Figures 2 through 4 there is illustrated a head 20 having a circular spring 21 connected to a slot 22. A free spinning socket 23 is held in the opening 21 by means of retaining screw 24. Each part of the head 20 is provided with cylindrical keyways 25 and 26. A drive member 27 having parallel cylindrical key members 28 and 29 which fit within the openings 25 and 26 respectively is provided with an opening 30 to receive a conventional socket handle, not shown.

In operation the structure of Figures 2-4 moves as follows: When torque is applied in the clockwise direction, viewing Figure 2, the split head 20 is clamped tightly onto the socket 23 by reason of the action of the two cylindrical key members 28 and 29 on the keyways 25 and 26, the key member in opening 25 acting as the fulcrum and the key member in the keyway 26 drawing the head tightly about the socket 23. When torque is applied in counter clockwise direction, viewing Figure 2, the head 20 releases socket 23 and moves freely about it to a new position.

While certain preferred forms of this invention have been illustrated and described herein it will be understood that the invention may be otherwise embodied within the scope of the following claim.

I claim:

A friction wrench comprising a head having a circular opening therein surrounded in part by a thin resilient section, a socket normally rotatable in said opening, a slot in said head extending from the circular opening to the periphery of the head, a pair of semicylindrical keyways in the head on diametrically opposite sides of the slot and opening into said slot over an arc substantially less than half the circumference of each, a handle and a pair of side by side cylindrical keys on said handle adapted to slide axially into said keyways and adapted to move the parts of the head on opposite sides of the slot with respect to one another, whereby to reduce the circumference of said opening about the socket to lock the socket against rotation when the handle is rotated in one direction and to enlarge the opening and free the socket when the handle is turned the opposite direction.

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