Jan. 14, 1936. C. B. INGERSOLL 2,027,534

STUD BOLT WRENCH

Filed Aug. 5, 1933

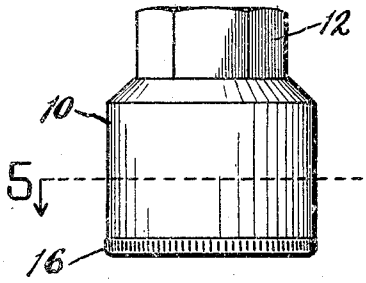

FIG 1

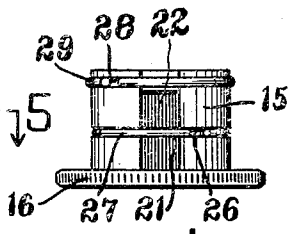

FIG 2

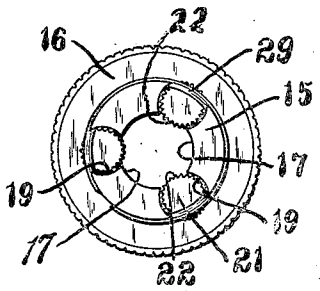

FIG 3

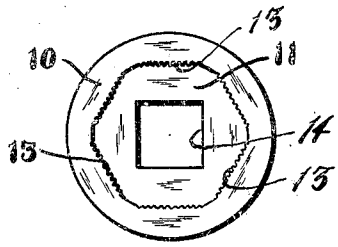

FIG 4

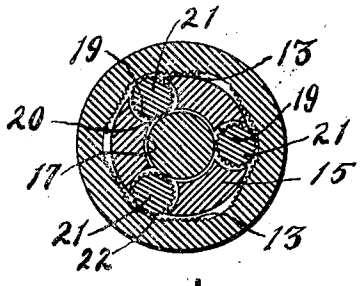

FIG 5

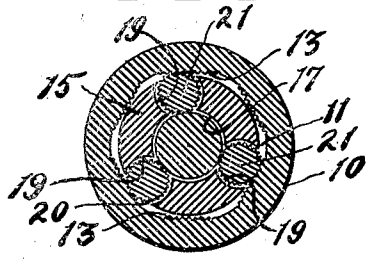

FIG 6

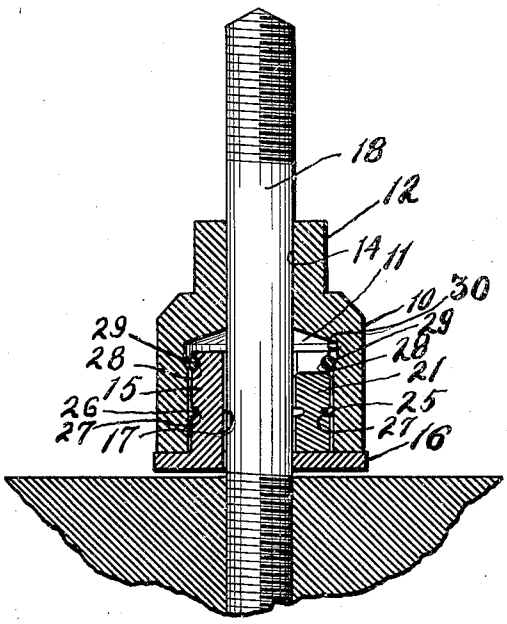

FIG 7

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STUD BOLT WRENCH

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1 Claim. (Cl. 81—53)

This invention relates to improvements in wrenches for securely gripping rounded articles and while intended for use generally wherever it may be advantageously applied, it is particularly adapted for use as a wrench for rotating stud bolts.

Objects of the invention are to provide a wrench of simple construction which can be economically manufactured, which may be conveniently used to operate a stud bolt and which will be very efficient in operation.

Other objects are to provide a wrench which may be quickly and conveniently placed over the end of a stud bolt, rod, pipe or other member of rounded cross section and which will securely grip and hold said member against a relative turning movement in either direction; may be operated without marring the threads or otherwise materially injuring the member.

An additional object is to provide a wrench head of the class above indicated having a casing with a wrench engaging face and to provide a plurality of gripping elements of different sizes which may be interchangeably used to fit bolts or other rounded members of different sizes.

The above objects are accomplished and additional ends are attained by the novel construction, combination and arrangement of parts hereinafter described and illustrated in the accompanying drawing in which there is shown a preferred embodiment of the invention, it being understood that the invention is capable of various adaptations and that changes and modifications may be made or resort had to substitutions which come within the scope of the claim hereunto appended.

In the drawing:

Figure 1 is a side elevational view of a wrench constructed in accordance with this invention,

Figure 2 is a side elevational view of the core employed in carrying out the invention,

Figure 3 is a plan view taken from the inner end of the core,

Figure 4 is a plan view of the barrel taken with core removed,

Figure 5 is a cross sectional view taken as indicated by the lines 5—5 of Figure 1, and showing the elements in an inoperative position,

Figure 6 is a similar view showing the elements in an operative position,

Figure 7 is a central, longitudinal, sectional view showing the wrench positioned on a stud bolt.

Proceeding now to a detailed description of the invention with reference to the particular adaptation thereof disclosed in the drawing, the numeral 10 denotes a shell or casing having a cavity 11 in one end thereof and having a reduced end portion 12 of hexagonal or other suitable shape adapted to be engaged by a wrench or other tool. The cavity 11 is formed with hexagonally arranged walls, the corners being rounded to form clearance space for the rollers hereinafter described. The walls of the cavity 11 are provided with longitudinal, parallel ribs and grooves 13. The reduced end portion 12 is provided with an axial socket 14 of square or other polygonal shape adapted to receive the head of a wrench handle which is of similar cross sectional shape. The numeral 15 denotes a cylindrical core which is adapted to loosely fit in the hexagonal cavity 11 of the shell 10. The core 15 is provided at the outer edge thereof with a flange 16 which overlaps the axial face of the shell.

The numeral 17 denotes an axial bore which extends through the core 15 and is adapted to receive the stud 18 or other member to be operated upon. The core 15 is also provided with three bores 19 which extend into the core 15 from the inner end thereof to a plane in spaced relation to the outer face of the core. The bores 19 are formed in parallel relation to the center bore 17 and are equally spaced around said center bore 17. The bores 19 are of sufficient diameter to form a slot 20 in the wall of the bore 17 and to form a relatively larger slot in the outer circumferential face thereof.

The numeral 21 denotes rollers which are adapted to loosely fit in the bores 19. The rollers 21 are provided over the circumferential face thereof with closely spaced, longitudinal ribs 22 and corresponding grooves which are adapted to mesh with the ribs 13 in the walls of the cavity 11. Each roller 21 is provided with an annular groove 25 and the core 15 with an annular groove 26 in which there is positioned a spring ring 27. The ring being seated in the groove 26 and entered in the outwardly presented portion of each groove 25 in each roller 21 to yieldably hold the rollers 21 in an inward position.

The core 15 is provided adjacent the rear end thereof with an annular groove 28 in which there is positioned a split spring ring 29 which has a slightly larger outside diameter than the core, and which is adapted to engage in the groove 30 to yieldably hold the core in an operative position therein.

It will be seen with the rollers 21 thus positioned in the core, the same will project outwardly beyond the cylindrical face of the core

15 and inwardly beyond the wall of the center bore. The core 15 is positioned in the cavity 11 of the shell with the projecting portion of each roller positioned in one of the rounded corners of the cavity 11 as shown in Figure 5.

The wrench is used by entering the stud or other member in the center bore 17, the core being easily mounted on said stud 18 when the rollers 21 are positioned in the corners of said cavity 11. A turning movement of the shell causes the teeth in each roller to engage the teeth 13 in the wall thus moving each roller toward the center portion of one of the sides of the wall of the cavity 11.

As the central portion of each of said sides is closer to the center of the core this moves the roller inwardly and causes the same to securely grip the stud 18 or other member so that it may be operated by placing a wrench on the wrench face 12 or by placing a crank in the square socket 14.

When it is desired to release the wrench, the shell 10 is moved back to its original position to bring the rollers 21 in the corners of the cavity, in which position the wrench may be freely moved on or from the bolt. In case it is desired to turn the bolt 18 or other member in the opposite direction, the opposite movement will cause each roller 21 to move over the adjacent wall in exactly the same manner so that the wrench may be conveniently operated to screw or unscrew a stud bolt 18 or other member of rounded cross section.

While I have illustrated and described the invention as applied to a stud bolt wrench, it is understood that the same may be used in mechanical devices wherein the member 18 is a driving member and the shell 10 a driven member.

The term stud bolt employed in the foregoing description and in the following claims is intended to include a rod, pipe or any member capable of being operated in connection with the device herein disclosed.

Having thus illustrated a particular adaptation of the invention and described the same in detail, I claim:—

In a device of the character described, a head having a cavity, a plurality of cam faces on the wall of said cavity, a core mounted in said cavity for rotary movement in either direction, said core having an axially arranged bore adapted to receive a member of rounded cross section; circumferentially spaced slots in the wall of said core, rollers mounted in said slots with the axes thereof disposed in parallel relation to the axis of said core, said rollers projecting inwardly into said bore and outwardly beyond the circumferential surface of said core, a circumferentially extending channel around the intermediate portion of each roller, a coincident circumferentially extending groove around said core, a split spring ring fitted in said groove and entered in the outwardly presented portion of each channel in each roller, said spring yieldably holding said roller in an inward position, said rollers adapted to grip said rounded member when moved into engagement with said cam faces by a relative turning movement of the head and core.

CHARLES B. INGERSOLL.