Dec. 30, 1930. L. D. BAIRD 1,787,185

WRENCH

Filed April 21, 1928

Fig. 1.

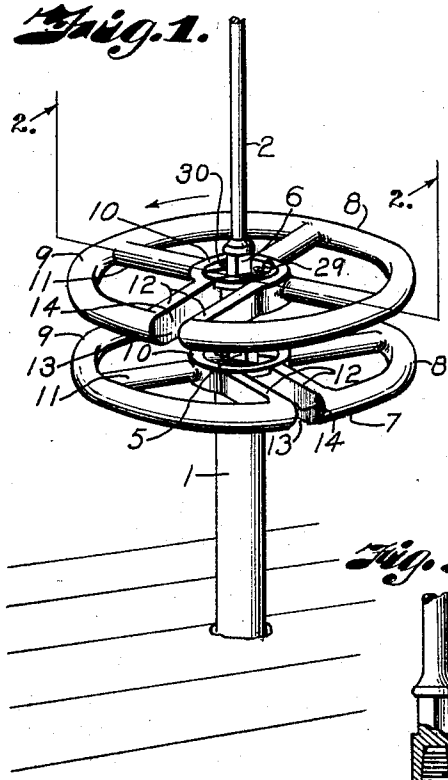


Fig. 2.

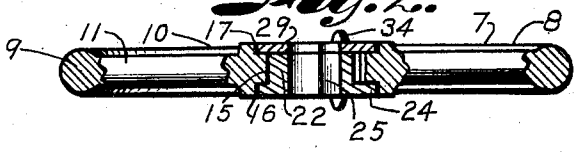


Fig. 3.

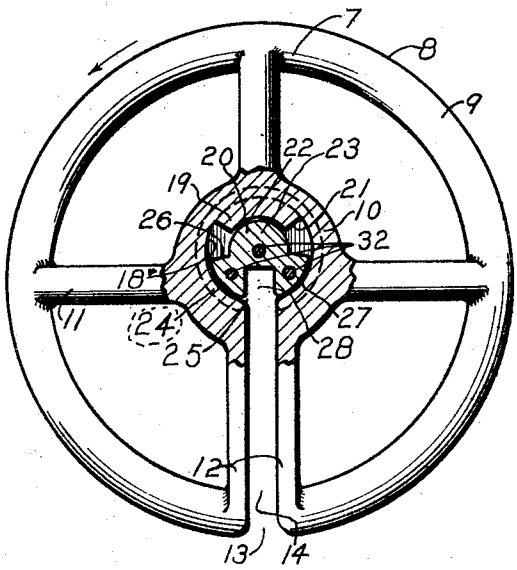


Fig. 5.

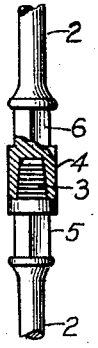


Fig. 6.

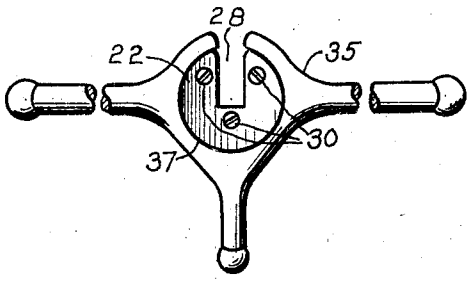


Fig. 4.

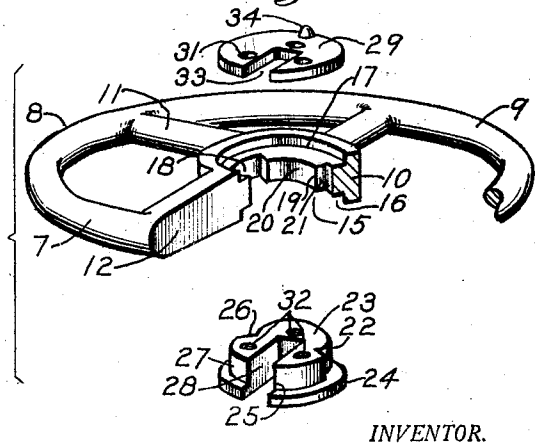
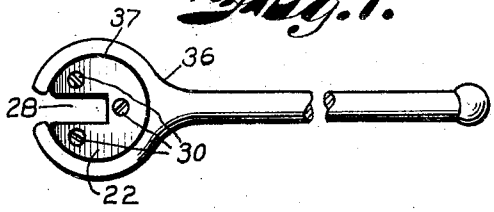


Fig. 7.



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Patented Dec. 30, 1930 1,787,185

UNITED STATES PATENT OFFICE

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WRENCH

Application filed April 21, 1928. Serial No. 271,769.

My invention relates to wrenches and more particularly to wrenches such as are employed for setting up and disconnecting the couplings that connect adjoining sections of a string of sucker rods used in pumping oil wells.

The principal objects of my invention are to expedite the connecting and disconnecting of the rod sections of a string of sucker rods, and to provide wrench-gripping means readily accessible to an operator from a single standing position so that a continuous rotating motion may be applied to the wrench in effecting a connection or disconnection of a rod coupling.

Further objects of the invention are to provide effective and easily operated jarring means for applying the final "snap" or "set up" to a coupling, to adapt a wrench for application to various sizes of sucker rod shanks, to provide interchangeable sockets in a wrench member, and to adapt a wrench to elevator functions.

In accomplishing these and other objects of the invention I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a pair of my improved wrenches applied to a coupling, the arrow indicating the direction of rotation of the upper wrench for effecting a disconnection.

Fig. 2 is a section on the line 2—2, Fig. 1.

Fig. 3 is a plan view of the wrench, partly broken away to illustrate the mounting of the socket member.

Fig. 4 is a perspective view of the disassembled wrench members, the wheel being partly broken away for better illustration of the interior of the hub.

Fig. 5 is a fragmentary perspective view of a sucker rod coupling.

Fig. 6 shows a modified form of the wrench.

Fig. 7 shows another modified form of the wrench.

Referring in detail to the drawings:

1 designates the upper end portion of a string of tubing which in accordance with oil well pumping practice extends into a well and is adapted for being fitted at its lower end with a pump (not shown). 2 designates a string of sucker rods extending through the tubing and adapted for connection at its lower end with said pump and at its upper end with a reciprocating means (not shown) positioned at the top of the well.

In employing apparatus of the character above mentioned for pumping oil wells, it is necessary that certain parts of the pump be removed occasionally for the reconditioning or replacement of worn parts, and the string of sucker rods must be removed before the pumping mechanism can be withdrawn.

A string of sucker rods in the illustrative application of the invention is composed of a plurality of sections of uniform length, each section having at one end a threaded pin, such as 3, and at its other end an internally threaded box such as 4 for engaging with the pin of an adjoining section, a number of sections being thus joined together to form a continuous rod extending from the pump to the actuating apparatus at the top of a well.

In removing a string of sucker rods from a well, each individual section is unscrewed from its engagement with the next lower section, after the section is lifted from the well sufficiently to permit the application of wrenches to the squared shanks 5 and 6 of the respective coupling portions of the rods.

In order that the connecting and disconnecting of the rod sections may be easily and quickly accomplished, I provide a wrench 7 comprising a supporting member 8 preferably consisting of a wheel having a rim 9, hub 10, radial support spokes 11 and spaced parallel guide spokes or arms 12, the rim being broken at 13 by the passage 14 formed by the spaced guide spokes 12 to admit the squared shank of a coupling into the hub of the wheel.

The hub 10 is eccentrically located with relation to the circular rim 9 and the opening 15 in the hub is counterbored at its ends to provide lower and upper shouldered recess portions 16 and 17, the recesses being concentric with the opening 15.

Projecting laterally into the opening 15 of the hub from the arcute wall 18 thereof is a stop lug or boss 19 having an arcuate wall

20, the boss being located directly opposite to the passage 14 and the end faces 21 of the boss being tapered outwardly and providing stop elements adapted for engagement by a socket member 22 presently described to stop the rotation of the same with respect to the hub.

The socket member 22 comprises an arcuate bearing portion 23 adapted to fit within the wall 20 of the boss 19 and a bottom flange 24 formed integrally and concentrically with the bearing portion and adapted to fit within the lower counterbore portion 16 of the opening 15.

The socket member is further provided with stop ears 25 formed integrally with the bearing portion 23 and flange 24, the ears having radial faces 26 adapted for engaging said tapered end faces 21 on the opposite ends of the boss 19, the peripheral vertical surfaces 27 of the ears being formed in arcs to fit rotatably within the arcuate wall 18 of the opening 15. A squared vertical socket-like opening 28 in the socket member 22 is adapted for alignment with the passage 14 between the guide spokes 12 of the wheel.

A retainer plate 29 fitting rotatably into the upper counterbored portion 17 of the hub is provided to cooperate with the flange 24 of the socket member 22 to retain the socket member in assembled condition with the wheel, the plate being secured to the socket member by screws 30 extending through openings 31 in the plate and into threaded openings 32 in the top side of the socket member.

The retainer plate 29 is further provided with a square opening 33 extending thereinto from the edge thereof for registering with the squared opening 28 in the socket member 22.

Formed on the top face of the plate 29 adjacent its edge and opposite to the opening 33 is a boss 34 whereby the socket may be manually rotated in the wheel for registering the squared opening in the socket with the passage 14 so that a coupling may be applied in the wrench.

Assuming a wrench to be constructed and assembled as described, its operation is as follows:

Referring to Fig. 3, the socket of the wrench is shown in a position of alignment with the passage 14 in the wheel so that the squared shank of a coupling may be received therein. Referring now to the upper wheel in Fig. 1, the wheel is positioned over the squared shank 6 so that the coupling extends axially through the wheel, and the wheel is rotated either clockwise or anti-clockwise depending on whether the coupling 4 is to be connected to or disconnected from the coupling 3. Assuming that the coupling 4 is to be disconnected, the wheel is rotated anti-clockwise as indicated in said figure, and will rotate idly from the position shown in Fig. 3 until the face 21 of the boss 19 collides with one of the ears 25. By rotating the wheel to and fro, a jarring effect is created as the boss 19 and ears 25 arrive in engagement and thus the unscrewing of a "set up" coupling may be started should the coupling fail to yield to a steady pressure applied to the wheel.

Two of the wrenches may be applied in connecting or disconnecting a coupling, one being employed to engage the lower shank and rest on the end of the tubing for supporting the string of rods, the upper wrench being used as a jarring means for "snapping" or "setting up" a coupling in making a connection or for starting the unscrewing of the joints in the socket when one of the faces 21 of the boss 19 is engaged by one of the ears 25 of the socket member.

In the modified forms of wrenches shown in Figs. 6 and 7, the socket member 22 heretofore described is applied in one of the holding members 35 and 36 having hub openings 37 identical to the opening 15 described in connection with the wheel wrench 7.

What I claim and desire to secure by Letters Patent is:

1. In a coupling wrench, a support comprising a circular hub and a radial handle, the hub having concentric recesses at the upper and lower ends of its central opening, a socket member comprising a body rotatable in the central hub opening and an integral flange seated in one of said recesses, a plate seated in the other hub recess and fixed to the body to retain the socket member rotatably in the hub, and means for limiting the rotation of the socket member with respect to the hub, the hub and socket member being provided with openings to admit a coupling to the socket member.

2. In a coupling wrench, a support comprising a circular hub and a radial handle, the hub having concentric recesses at the upper and lower ends of its central opening and a lateral opening, a socket member having a radial socket alignable with said lateral opening and comprising a body rotatable in the central hub opening having a flange seated in one of said recesses and lateral ears, a plate seated in the other hub recess and fixed to the body to retain the socket member rotatably in the hub, and a boss on said hub engageable with said socket member ears to limit the rotation of the socket member with respect to the hub.

3. In a wrench of the character described, an operating member including a hub having an annular opening and a concentric recess in said opening, a radial passageway leading to said opening, a socket member including a body rotatable in the opening and having an integral flange seated in said recess, a plate fixed to the socket member opposite the flange and engaging the hub to retain the

socket member rotatably in the hub, said plate and socket member having openings complementary to the passageway, and means for limiting rotation of the socket member within the hub.

4. In a wrench of the character described, an operating member including a hub having an annular opening and a concentric recess in said opening, a radial passageway leading to said opening, a socket member including a body rotatable in the opening and having an integral flange seated in said recess, a plate fixed to the socket member opposite the flange and engaging the hub to retain the socket member rotatably in the hub, said plate and socket member having openings complementary to the passageway, and means for limiting rotation of the socket member within the hub, comprising a boss extending into the annular opening and ears on the socket member engageable with said boss.

In testimony whereof I affix my signature.

LYNNE D. BAIRD.