G. A. STAFFORD

COMBINATION SUCKER ROD WRENCH AND ELEVATOR

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Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

George A. Stafford

Attorney
To all whom it may concern:

Be it known that I, George A. Stafford, citizen of the United States, residing at Sourlake, in the county of Hardin and State of Texas, have invented certain new and useful Improvements in Combination Sucker-Rod Wrenches and Elevators, of which the following is a specification.

This invention relates to new and useful improvements in a combination sucker rod wrench and elevator.

One object of the invention is to provide a tool of the character described which has been specially designed for the purpose of handling sucker rods of pumps used in pumping wells.

In the production of oil and similar fluid the pump is operated from the ground surface through a sucker rod which is attached to the traveling valve of the pump, and it often becomes necessary to pull the traveling valve from the pump for the purpose of renewing the cup rings and other parts of the valve. In accomplishing this work the sucker rod must be unscrewed at the joints in pulling the same from the bore and when being replaced in the well these joints must be again screwed together. The device herein described is used in pulling the rods and unscrewing them and again in screwing the rods together, after the valve has been repaired and is being let down into the tubing.

Another object of the invention is to provide a device of the character described which may be used as a wrench in unscrewing the joints of the sucker rod and in screwing them together, and which may also be used for elevating the joints and laying them aside as they are unscrewed and for holding them in position while being screwed together in making the rod up.

A still further feature of the invention resides in the provision of a device of the character described wherein the rods may be securely locked so that there will be no danger of dropping the joints, and injuring the workmen while the work is being done.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:

Figure 1 shows a plan view of the device in position to be applied to the sucker rod joint.

Figure 2 is a side view partly broken away.

Figure 3 shows the device applied to the sucker rod partly in section.

Figure 4 shows a side view of the device in position to be used as an elevator.

Figure 5 shows a bottom plan view of the top plate and,

Figure 6 is an edge view thereof.

In the drawings the numeral 1 designates a joint of the sucker rod. The upper end of each joint has an enlarged head 2 formed with an internally threaded socket into which the lower end of the joint above is threaded. This socket has not been shown for the reason that it is common to sucker rods. Spaced beneath this enlarged head 2 there is an enlarged annular shoulder 3 and between this head and shoulder a section 4 of the sucker rod is formed square to receive the wrench whereby the joint of the sucker rod is held stationary while the one above it is being unscrewed. The numeral 5 designates the bottom plate of the device which is preferably circular in form and which has oppositely disposed pintles 6, 6. The numeral 7 designates a handle which is bifurcated forming the arms 8, 8, whose free ends have bearings 9, 9 which receive the pintles 6. The bottom plate has a central circular opening as 10 and surrounding this opening there is an annular groove 11 cut in the underside of said plate 5.

The numeral 12 designates the top plate which is of somewhat greater diameter than the diameter of the bottom plate, as shown in Figure 4. The overhanging rim of the top plate has four undercut notches or recesses arranged in pairs, the recesses of each pair being arranged opposite each other, and the top plate 12 has a depending central boss 14 which fits through the central opening 10 of the bottom plate and forms a bearing therein, and depending from this boss 14 are the lugs 15, which, when the plates 5 are assembled, may be bent outwardly into the position shown in Figure 3 so that their free ends will lie in the groove 11 to form locking means for holding said plates together, and on opposite sides of the boss 14 there are the stops 16, 16 which work in the arcuate grooves 16', 16' cut in the plate 5.
around the central opening 10. The top plate has a radial slot 17 flared at its outer end, as shown in Figures 1 and 6 and said bottom plate has a similar slot which coincides with the slot of the top plate when it is desired to apply the device to the sucker rod.

In application the device is arranged in the position shown in Figure 1 and is then applied to the square section 4 of the sucker rod joint as shown in Figure 3. When applied, if it is desired to unscrew the joint above, the handle 7 is manipulated to the right and this will carry the bottom plate around so as to lock the sucker rod in the tool to prevent its accidental displacement therefrom. A wrench may then be applied to the joint of the sucker rod above and it may be unscrewed from the joint being held, and laid aside. The handle 7 is then swung into vertical position. It is to be noted that the bearing members 9 are elongated so that when the handle 7 is swung into vertical position said bearings will lock in the corre-

sponding recesses 13, as illustrated in Figure 4 and this will lock the top and bottom plates against relative rotation so that the sucker rod can not become displaced and fall out while being elevated. The end of the handle 7 is provided with a link 18 to which the cable may be attached for elevating the sucker rod, to permit the unscrewing of another joint or for handling the unscrewed joint of the rod.

When the device is applied to the joint and it is desired to screw the upper joint onto the one being held in the process of lowering the sucker rod in making it up, the handle is manipulated to the left and this will operate to lock the joint being held and hold it while the wrench is being applied to the joint above in screwing it up. However in making up the sucker rod the joints thereof are picked up one at a time and screwed onto the upper end of the rod and as each joint is screwed on, the rod is gradually lowered into the well. In picking up the joint the device is applied to the upper end thereof and turned to the left and the joint is then swung up in line above the rod to which it is to be attached and its lower end screwed into the head 2 of the joint beneath. When the rod is lowered so as to bring the upper end of it down to the casing head the device will be in the right position to hold the sucker rod while another joint is being screwed onto the upper end thereof.

It is to be observed that two of the device have to be used in breaking up the sucker rod and pulling it out of the well or in making it up and setting it down into the well. The well casing has, at its upper end, what is known as a casing head and one of the devices, when in use, rests on the casing head and sustains the entire sucker rod beneath, and the other device is used for handling the joint being unscrewed from, or screwed onto, the sucker rod and this last mentioned device is attached to said joint being handled at its upper end. It is to be noted that the link 18 has a swiveling connection with the handle 7 so that the joint of the sucker rod being handled can be turned in either direction without twisting the cable. The range of rotation of the bottom plate relative to the top plate is limited in each direction by the ends of the grooves 16. When rotated in one direction the bottom plate 5 will be stopped by the studs 10 coming in contact with the ends of the grooves 16 so as to align opposing recesses 12 in position to be locked by the bearings 8, as illustrated in Figure 4, and when rotated in the other direction the other ends of said grooves will stop said plate 5 so as to align the other recesses 15 in position to receive the bearings 9 when the handle 7 is swung into vertical position.

When it is desired to release the device from the sucker rod the handle 7 is swung into horizontal position and then turned so as to align the slots of the plates 5 and 12 and the device may thus be readily released from the sucker rod. From the foregoing it is evident that the device herein described may be readily applied to a sucker rod joint and said joint securely held while another joint is being screwed onto or screwed from it, and it will also act as an elevator wherein the sucker rod, or a joint thereof, may be securely locked and through which the same may be readily elevated, lowered or otherwise handled without any danger of the rod or joint being handled becoming released and accidently falling and thus injuring the workmen or the well.

What I claim is:

1. A device of the character described including two relatively rotatable members, one having a central opening and a side slot, a boss carried by the other member working in said opening, said last mentioned member having a radial slot, said slots coinciding when said members are in one position, relative to each other, a handle connected to the first mentioned member and provided to work in a common plane therewith to rotate the same, said handle being movable into vertical position to suspend the device, said handle interlocking with the other member when in vertical position to lock said members against relative rotation.

2. A device of the character described including two relatively rotatable members, one having a central opening and a side slot, a handle connected to said member, a boss carried by the other member working in said opening, said last mentioned member having
a radial slot, said slot coinciding when said members are in one position, relative to each other, means securing said members in working position relative to each other, and means carried by the handle adapted to lock said members against relative rotation.

3. A device of the character described including two relatively rotatable members, one having a central opening with a side slot, a boss carried by the other member and working in said opening, said boss and the member carrying the same having a radial slot, a handle formed with arms which are pivoted to one of said members at opposite sides thereof and means carried by the handle and adapted to interlock with the other member.

4. A device of the character described including two relatively rotatable members, one having a central opening with a side slot, a handle formed with arms which are pivoted to said member at opposite sides, a boss carried by the other member and working in said opening, said boss and the member carrying the same having a radial slot, means limiting the relative rotation of said members in either direction and means carried by said arms for locking said plates against relative rotation at the limit of their movement in either direction.

5. A device of the character described including a bottom plate having a central opening, and a side slot, a handle having arms pivoted to said plate at opposite sides, a top plate having a radial slot, a boss carried by said top plate and working in said opening, means limiting the range of rotation of said plates relative to each other in either direction, means carried by said arms arranged to lock with the top plate when said plates are at the limit of their range of relative rotation in either direction, to lock said plates against relative rotation.

6. A device of the character described including a bottom plate having a central opening and a side slot, suspending means pivoted to said plate at opposite sides, a top plate having a radial slot, means limiting the rotation of said plates relative to each other in either direction, means carried by the suspending means and arranged to lock with the top plate to lock said plates against relative rotation.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE A. STAFFORD.

Witnesses:
E. V. HARDWAY,
W. H. DUNLAY.