

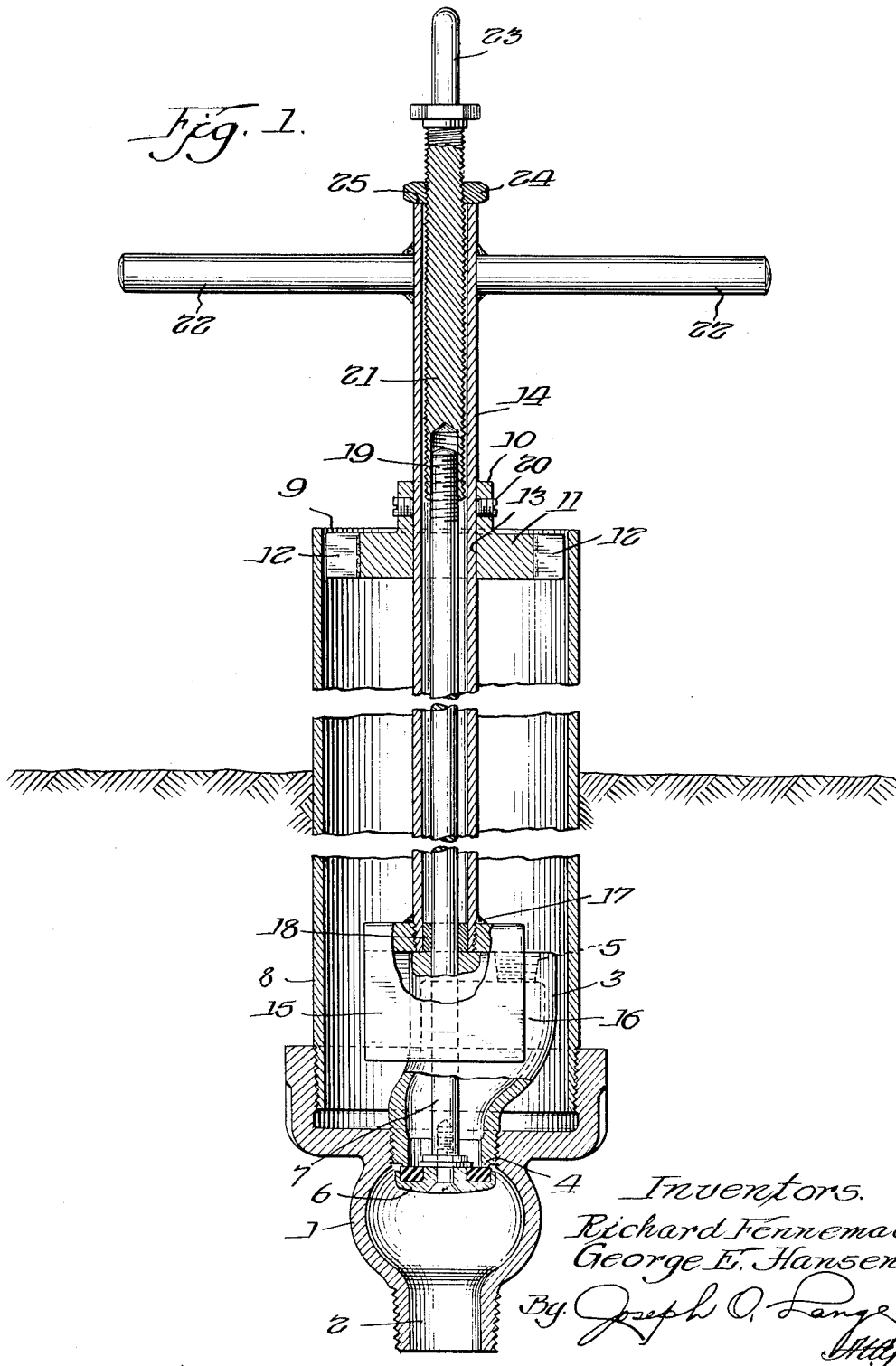
June 9, 1953

R. FENNEMA ET AL
VALVE REMOVAL WRENCH.

2,641,052

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2 Sheets-Sheet 1



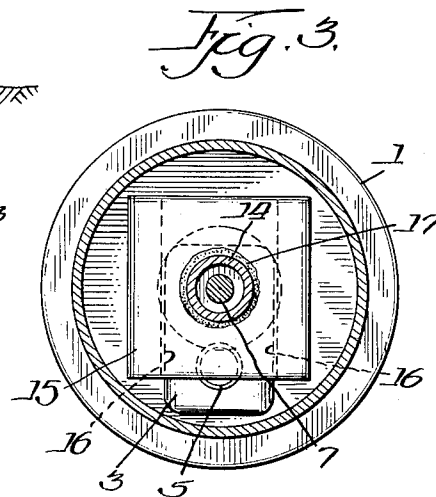
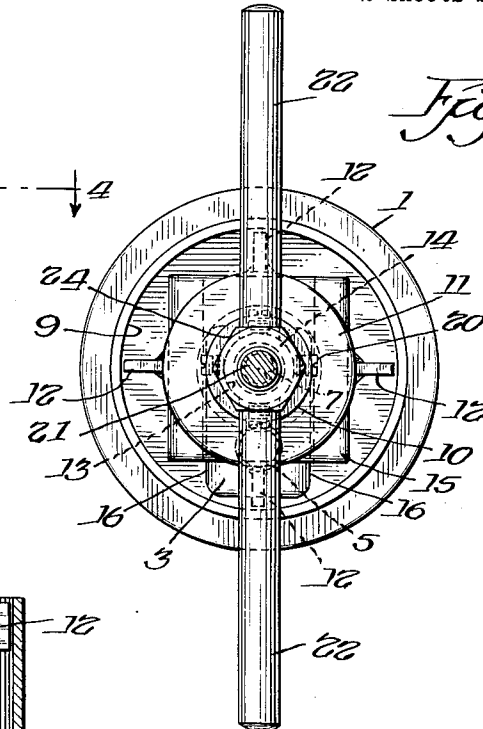
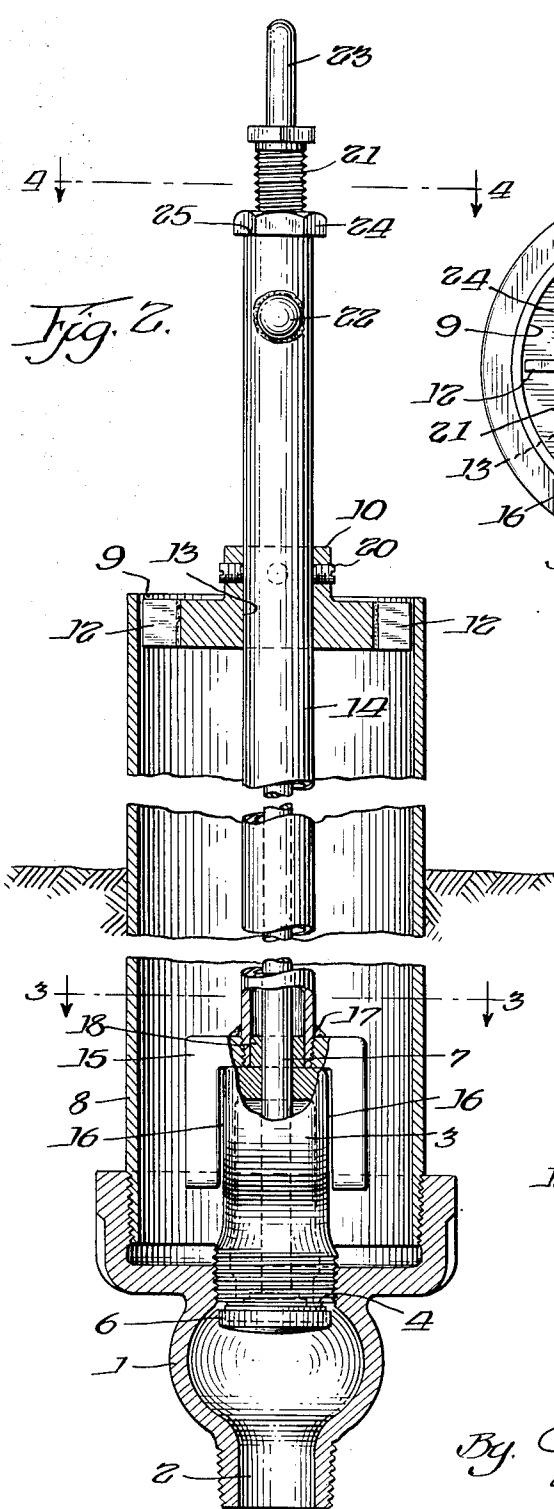
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VALVE REMOVAL WRENCH

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4 Claims. (Cl. 29—213)

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This invention relates to a wrench and more particularly it is concerned with a novel wrench for use in connection with underground valve removal or for those installed in tanks or the like.

Heretofore industry has been faced with a serious problem in connection with the removal of sub-surface valves and this applies particularly to those located underground due to the fact that such distances may be considerable and that substantial loads could not be applied without the danger of distorting or even severing the valve body, the closure or the stem during the course of such removal. In underground installations it is quite desirable to be able to withdraw valves for replacement of parts or for inspection on occasion. The type of wrench forming the subject matter of this invention has been found particularly useful in that it may be made cheaply and yet at the same time it can be easily applied with a minimum amount of effort.

Thus it is one of the more important objects of this invention to provide a removable wrench for valves and the like in which the closure member and stem may be easily removed from the valve body without twisting or distortion and while being able to also apply substantial effort in the event that it becomes necessary to work against considerable friction.

Another object is to provide for a wrench construction in which the removal of the valve including the stem, bonnet and closure means may be accomplished through the casing normally shielding the valve from exposure to the underground soil.

Other objects and advantages will become more readily apparent upon proceeding with the following description read in light of the accompanying drawings in which

Fig. 1 is a sectional assembly view of the novel wrench embodying our invention applied to a valve preliminary to removal.

Fig. 2 is a sectional assembly view taken at right angles to the view described in connection with Fig. 1.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2.

Similar reference numerals refer to similar parts throughout the several views.

Referring now to Fig. 1 the valve casing or body 1, installed below the ground as shown, is provided with the usual inlet 2 to a convenient source of water supply (not shown). The body

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has assembled above it in threaded relation a bonnet or outlet portion 3 having the valve seat 4 and the pipe conduit outlet as shown in dotted lines 5. Seated against the valve seat, as shown, is the disc valve closure member 6 preferably threadedly attached to the stem 7 as indicated. The stem, by means not shown, in normal course of installation, provides for the necessary reciprocating movement of the valve closure 6 whereby the valve may be opened or closed as desired, shutting off or releasing the flow through the outlet 5 from the inlet 2. At its upper end portion, the body 1 is enlarged to receive the tubular casing 8 which is threadedly received within said enlarged portion as shown. The purpose of the latter casing is to serve jointly as a container for the bonnet member 3 and a portion of the actuating stem hereinafter referred to, thereby to shield the latter members from direct contact with the surrounding soil. At its upper end portion the casing 8 is open as indicated at 9. Relatively snugly fitted within the opening 9 is the top guide member 11 which, as shown more clearly in plan in Fig. 4, is provided with the radially extending ribs 12. The top guide 11 is apertured as at 13 to receive the pipe or tubing 14 enclosing the stem 7 and which latter tubing serves as the vertical post or support for the wrench. At its lower end, the pipe 14 is threaded and received within the open end head or socket 15 of the wrench. As shown more clearly in Fig. 2 the outer portion of the bonnet member 3 is flattened on its sides as at 16 so that the wrench head 15 similarly formed interiorly is non-rotatably mounted relative to the bonnet member 3 when placed thereover. To prevent relative rotation of the pipe 14 on its threads the weld seal 17 is preferably used. Adjacent the threaded end portion and within the pipe 14 the guide 18 snugly receiving the stem 7 is mounted in non-rotatable relation to the pipe 14. At its upper end the stem 7 is threaded as at 19 and received within the threaded socket as illustrated within the threaded sleeve 21. The tubing 14 guided within the hub 10 of the top guide 11 preferably by means of the headless set screws 20, positioned as shown more clearly in Fig. 2.

The set screws 20 are intentionally set tightly into the hub 10 of the member 11 so as to frictionally engage the outer periphery of the pipe 14 thereby permitting the latter members to be rotated together as hereinafter described. It should also be noted that the top guide 11 serves as a gauge when thus mounted because its posi-

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tion longitudinally on the pipe 14 and its projection into the tube 8 will indicate how deeply into the body 1 the bonnet 3 has projected in forming the valve seat at 4 for the disc 6. To enable the top guide to be rotated, the wrench 5 post or pipe 14 is provided with the diametrically disposed arms 22, the portion 23 of the sleeve 21 serving as a handle or gripping means for reasons hereinafter set forth in detail.

A lock nut 24 shouldering at 25 is mounted at the upper end of the sleeve threadedly to permit the desired adjustment for reasons also hereinafter made clear.

The long running threads on the sleeve 21 are intentionally provided in order to permit such adjustment as may be necessary depending upon the depth or distance of the valve within the ground.

Suppose that it is now desired to remove the bonnet member 3 which is threadedly attached to the body 1 as indicated. Initially the lock nut 24 is rotated to draw the sleeve 21 upwardly, thereby drawing the closure member 6 tightly against the seat 4. Thus the stem 7 is held substantially rigidly between the seat surface 4 and the shoulder 25 of the tubing 14, the sleeve being hand-gripped at 23 during the course of tightening the lock nut 24 downwardly against the shoulder 25. This provision permits raising of the disc or valve closure member 6 to abut against the valve seat 4. When the disc has been so positioned the pipe or tubing 14 is then rotated by means of the handle 22 thereby causing the bonnet member 3 which is non-rotatably engaged by the socket 15 to be rotated on its threads. Thus upon rotation of the member 3 the stem 7 and the closure member 6 is rotated as a unit with the bonnet 3 eliminating any chance for distortion, turning or twisting at the valve seat to cause objectionable tearing. Since the stem is snugly guided by the bushing 13 and the pipe or tubing 14 is relatively snugly guided within the casing 8 by means of the radially extending ribs 12 integral with the top guide 11 there is no side wobble or twisting. The wrench of course is capable of desirable adjustability by means of the long running threads on the sleeve 21 permitting a secure grip before actual rotation in removing the member 3 commences.

It should of course be apparent that the particular exemplifications in which the invention may take form are numerous. Accordingly the invention should therefore be interpreted in light of the appended claims.

We claim:

1. A wrench for effecting the simultaneous removal of valve bonnet with a seat, stem, and closure member or the like from underground valves having a tubular extension therefrom to the surface, the combination including an open end socket head for straddling the bonnet, a tubular support member fixedly attached to the said socket head, a top guide member non-rotatably mounted on the said tubular support member and having spaced-apart peripheral portions for snug rotation within the valve tubular extension, a sleeve within the tubular support member and having thread means for engaging an end portion of the valve stem to draw the latter against the bonnet, the said sleeve being threaded exteriorly for a substantial portion of its length to permit axial adjustment of the latter relative to the valve stem when the latter is drawn toward the bonnet, threaded means mounted on the tubular support member and engaging the exteriorly threaded portion of the sleeve for lock-

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ing the said sleeve against longitudinal movement relative to the tubular support member when the wrench is actuated to remove the valve bonnet, stem, and closure member, the said sleeve engaging locking means being predeterminedly rotatable relative to the tubular support member whereby the closure member may be drawn to the bonnet seat.

2. A wrench for effecting the simultaneous removal of valve bonnet with a seat, stem, and closure member or the like from underground valves having a tubular extension therefrom to the surface, the combination including a socket head for engagement with the valve bonnet, a tubular support member fixedly engaging the said socket head and being predeterminedly rotatable relative to the said stem, a top guide member non-rotatably mounted relative to the said tubular support member for snug rotation within the valve tubular extension, a threaded sleeve received within the tubular support member and having means for engaging an end portion of the valve stem, the said sleeve being threaded for a substantial portion of its length to allow for extended axial adjustment of the sleeve relative to the valve stem engagement and threaded means engaging the sleeve and tubular support member for locking the said sleeve against longitudinal movement relative to the tubular support member when attached to the valve stem, the said sleeve engaging threaded means upon predetermined rotation drawing said sleeve and stem upwardly to hold the closure member against the bonnet seat.

3. A wrench for effecting the simultaneous removal of valve bonnet with a seat, stem, and closure member or the like from underground valves having a wrench-receiving tubular extension therefrom leading to the surface, the combination including a socket head for engagement with the valve bonnet, a substantially tubular support member fixedly engaging the upper portion of said socket head, a circular top guide member non-rotatably mounted relative to the said tubular support member for combined rotation and axial movement within the valve tubular extension, an internally threaded sleeve within the tubular support member for engaging a threaded end portion of the valve stem, the said sleeve being externally threaded for a substantial portion of its length to allow for axial adjustment of the sleeve relative to the valve closure and stem thereby to draw the latter member against the bonnet and means engaging upper end portions of the sleeve and the tubular support member for holding the said sleeve against longitudinal movement relative to the tubular support member when predeterminedly engaged by the valve stem, the said latter sleeve engaging means comprising a member initially rotatable relative to the sleeve and the tubular support member whereby to effect the axial movement of the said sleeve and draw the closure member tightly against the bonnet seat.

4. A wrench comprising telescopically arranged tubular elements for effecting the simultaneous removal of valve bonnet, stem, and closure member or the like from underground valves having a tubular extension to receive the wrench, a socket head for engagement with the bonnet, one of the telescopically arranged elements being a tubular support member fixedly engaging the said socket head, the said tubular support member being the external element of the said telescopically arranged tubular elements, a top

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guide member non-rotatably mounted and adjustably movable axially relative to the said tubular support member for snug rotation within the valve tubular extension, the other telescopically arranged element being a threaded sleeve for engaging an end portion of the valve stem, the said sleeve being threaded for substantially its full length to allow for axial adjustment of the latter relative to the valve stem, the said sleeve having an end extension for a hand grip when adjustably positioning one telescopically arranged element axially relative to the other, and a locknut rotatable on said sleeve to pre-terminately bear against the tubular support member and draw the latter member upwardly

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thereby to maintain the said closure member in a seated position relative to the said bonnet.

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