J. R. MATULA.

TOOL FOR UNSCREWING PIPE JOINTS FROM WELLS.

APPLICATION FILED JAN. 7, 1918.

1,277,624.

Patented Sept. 3, 1918.

2 SHEETS—SHEET 1.

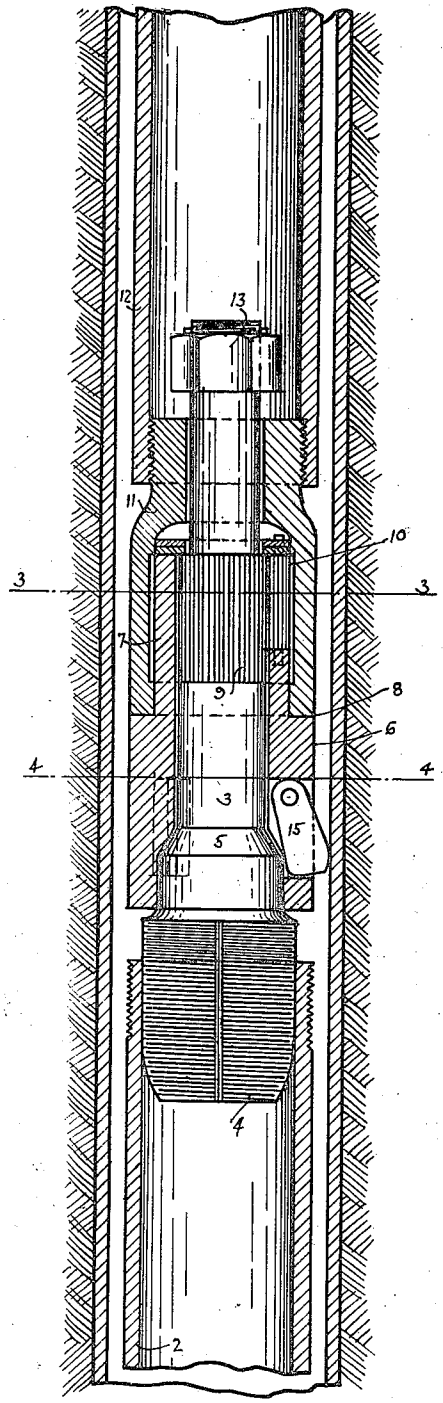


FIG. 1

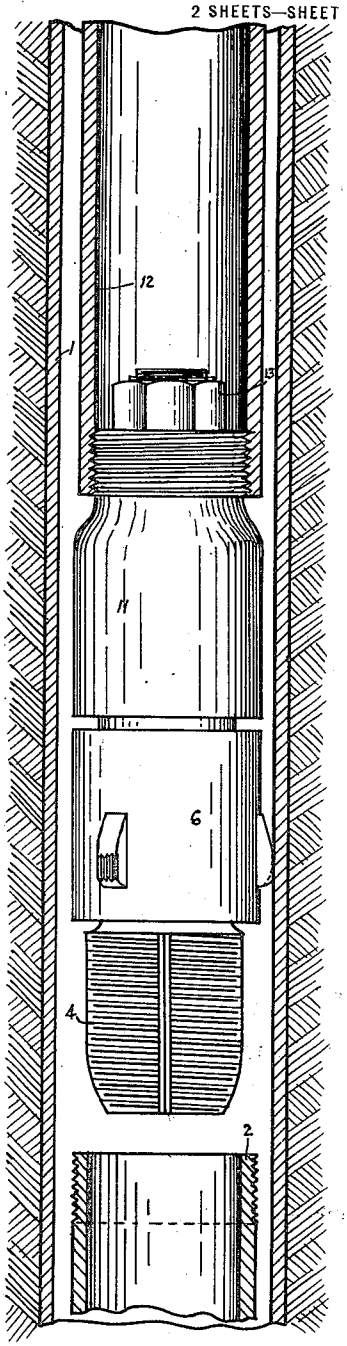


FIG. 2

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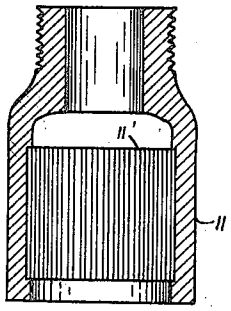


FIG. 8

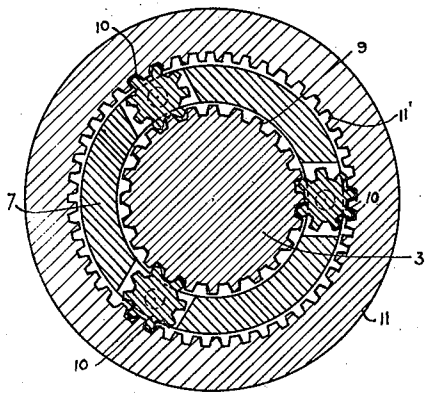


FIG. 3.

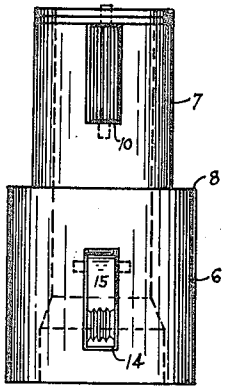


FIG. 7

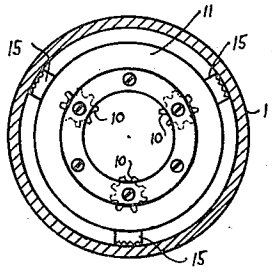


FIG. 5

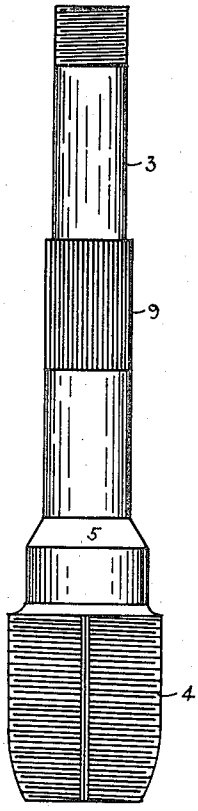


FIG. 6

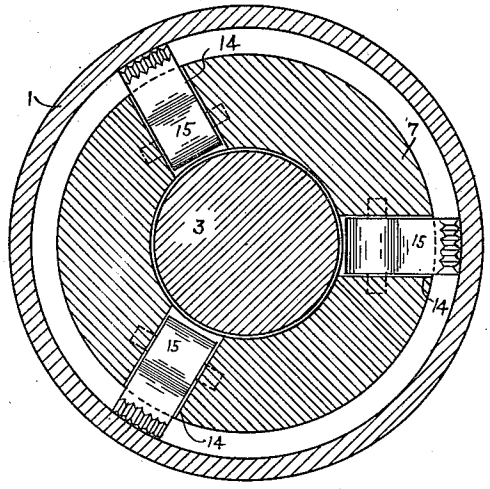


FIG. 4

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UNITED STATES PATENT OFFICE.

JOSEPH R. MATULA, OF MOULTON, TEXAS.

TOOL FOR UNSCREWING PIPE-JOINTS FROM WELLS.

1,277,624. Specification of Letters Patent. Patented Sept. 3, 1918.

Application filed January 7, 1918. Serial No. 210,660.

To all whom it may concern:

Be it known that I, JOSEPH R. MATULA, a citizen of the United States, residing at Moulton, in the county of Lavaca and State of Texas, have invented certain new and useful Improvements in Tools for Unscrewing Pipe-Joints from Wells, of which the following is a specification.

This invention relates to new and useful improvements in a tool for unscrewing and withdrawing pipe joints from wells.

The object of the invention is to provide a device of the character described whereby the joints of pipe which have become stuck in the well may be unscrewed and withdrawn. In deep well drilling by the well known rotary process, a drill stem is employed to the lower end of which is attached the drill bit. This stem is formed of joints connected by means of collars having right hand threads. This stem often becomes stuck in the bore, and in order to extract it, the joints must be unscrewed, usually one at a time. The most common methods of unscrewing these pipe joints is to provide a string of pipe connected by collars having left hand threads, to the lower end of which a fishing tool is attached to engage with the pipe to be withdrawn, and this string of pipe is rotated backward by reversing the rotary and the joint of the stuck pipe thus unscrewed. This method necessitates the keeping on hand of a string of left hand threaded pipe, involving considerable investment and it is furthermore quite difficult to operate inasmuch as the string of pipe, to which the fishing tool is attached, is quite heavy and cumbersome. The device herein described is comparatively light and inexpensive and is operated without reversing the rotary.

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

Figure 1 is a vertical sectional view of the device applied to the stem to be withdrawn.

Fig. 2 is a side elevation of the device being lowered into the well.

Fig. 3 is a transverse sectional view of the device taken on the line 3, 3, of Fig. 1.

Fig. 4 is a transverse sectional view taken on the line 4, 4 of Fig. 1.

Fig. 5 shows a plan view of the device.

Fig. 6 shows a side view of the rotary shaft employed.

Fig. 7 is a side elevation of the anchor employed, and

Fig. 8 is a vertical sectional view of the driving member.

Referring now more particularly to the drawings wherein like numerals of reference designate similar parts in each of the figures, the numeral 1 refers to a casing which is let down into the bore as the drilling progresses, and the numeral 2 refers to a section of the drill stem through which the bit is driven. The ends of each joint of this stem are provided with external right hand threads to receive the couplings, by means of which the joints are secured together in the well known manner. As before explained, when the drill stem becomes stuck in the bore, the joints must be turned backwardly in order to unscrew them singly so that they may be withdrawn. For this purpose an unscrewing device has been provided which will now be described:—

A shaft 3 is provided whose lower end is formed into an enlarged head 4, tapering at its lower end and having external left hand threads. This head is of a size to fit closely in the upper end of the drill stem, and when rotated backwardly, or to the left, its threads will engage with the joint of drill stem and rotate it backwardly to unscrew it; and above the head the shaft is provided with tapering shoulder 5, provided for a purpose to be hereinafter described. A sleeve 6, forming an anchor, is provided, through which the shaft 3 extends and the upper end of this anchor is reduced, forming a neck 7 and an abrupt shoulder 8. The section of the shaft within said neck is formed into a spur gear 9 with which the spur gears 10, rotatably mounted in the anchor, mesh, and fitting over the neck 7 is a sleeve like driving member 11, having an internal gear face 11′ in mesh with the gears 10. The upper end of the member 11 is reduced and externally threaded to receive the lower end of the stem 12. This stem

is connected to the sleeve 11 by right hand threads and is driven from the rotary (not shown) in a well known manner. The upper end of the shaft 3 extends up through the member 11, and carries the nut 13 to prevent the detachment of said member therefrom.

The anchor 6 has a plurality of slots 14 cut therethrough and spaced apart thereround, and in these slots work the dogs 15 which are pivoted therein.

When the device is being let down into the well it will be suspended from the stem 12, the nut 13 resting against the upper end of the member 11 and the sloping shoulder 5 of the shaft will force the dogs 15 outwardly against the casing 1 so as to hold the device centered and direct the head 4 into the upper end of the joint 2. Inasmuch as these dogs sustain only the weight of the anchor 6 in lowering the device, they will not engage with the casing. When the device is lowered and the head 4 is received by the upper end of the joint 2, the weight of the stem 12 will then be sustained by the shoulder 8 and the dogs 15 will be forced to engage with the casing 1 and will prevent the anchor 6 from turning. When the stem 12 is rotated it will operate through the spur gears 10 to rotate the shaft 3 in the reverse direction, causing the head 4 to engage with the joint 2 and unscrew the stem. Said joint may then be withdrawn from the bore.

What I claim is:—

1. A device of the character described including an anchor having a central bearing, a member rotatable in said bearing, pipe engaging means carried by said member, engaging means adapted to be held in engagement with a well casing by said member to prevent the rotation of said anchor, and a driving stem operatively connected to said member whereby the member may be rotated through said stem and in the opposite direction.

2. A device of the character described for unscrewing the joints of a drill stem including an anchor provided with a central bearing and slots radiating therefrom, dogs working through said slots, a rotary member operating in said bearing and holding said dogs projected through the slots to engage with the well casing and prevent the rotation of the anchor, means carried by the rotary member to engage with the drill stem and rotate the same, a driving stem, and means operatively connecting the stem with the rotary member whereby the rotation of the former operates to rotate the latter in the opposite direction.

3. A device of the character described including an anchor provided with a bearing, a member rotatable in said bearing, pipe engaging means carried by said member, means carried by the anchor and held in engagement with a well casing to secure the anchor against rotation, a rotatable drive stem and means operatively connecting said stem with said rotatable member through which said member is rotated from the stem but in the opposite direction.

4. A device of the character described including an anchor having a bearing and member rotatable in said bearing whose lower end is formed to engage with the drill stem, means carried by the anchor and held in engagement with the well casing by said member to prevent the rotation of the anchor, a drive stem and means operatively connecting said stem with said rotatable member through which the rotation of the stem is imparted to said member in the opposite direction.

5. A device for unscrewing and withdrawing pipe from wells including an anchor having a central bearing and radiating slots, a member rotatable in said bearing, whose lower end is formed to engage with the pipe joint, dogs pivoted in said slots and held in engagement with the well casing by said member, a drive stem, a train of gears through which the rotation of the stem is imparted to said member in the opposite direction.

6. A device for unscrewing and withdrawing pipe from wells including an anchor having a central bearing and radiating slots, a member rotatable in said bearing whose lower end is formed into a head adapted to engage in a pipe, dogs operating through said slots and held in engagement with the well casing by said member to prevent the rotation of the anchor, a rotatable drive stem and a train of gears through which the rotation of said stem is imparted to said member so as to rotate said member in the opposite direction from the rotation of the stem.

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

JOSEPH R. MATULA.

Witnesses:

OTTO VON ROSENBERG,

MAX REISSIG.