

C. R. EDWARDS.
UNSCREWING DEVICE FOR PIPE JOINTS.
APPLICATION FILED AUG. 4, 1919.

1,334,487.

Patented Mar. 23, 1920.
2 SHEETS—SHEET 1.

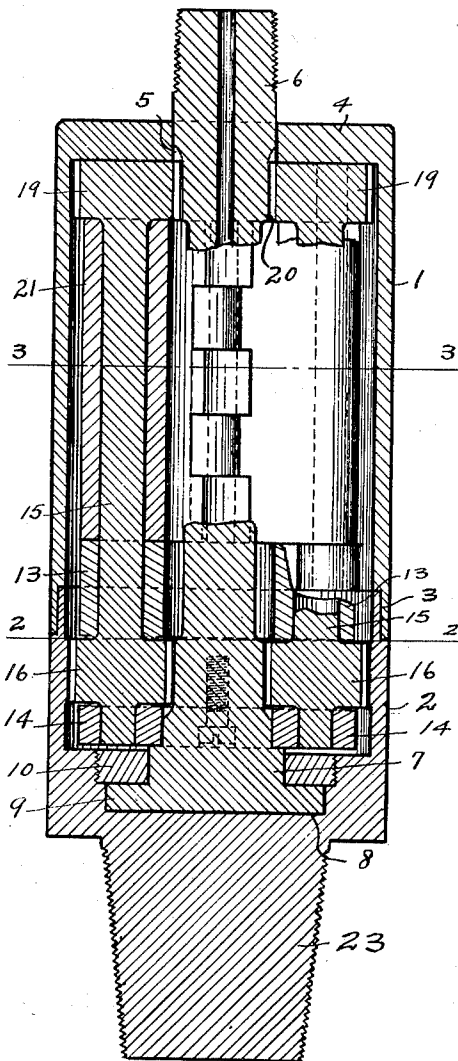


Fig. 1.

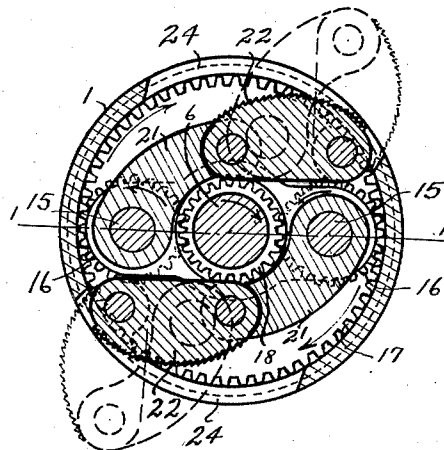


Fig. 3.

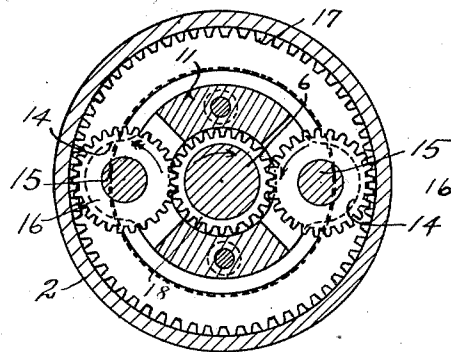


Fig. 2.

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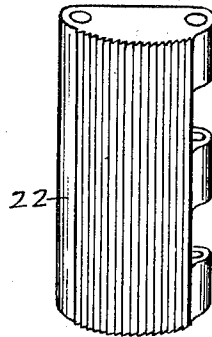


Figure 5.

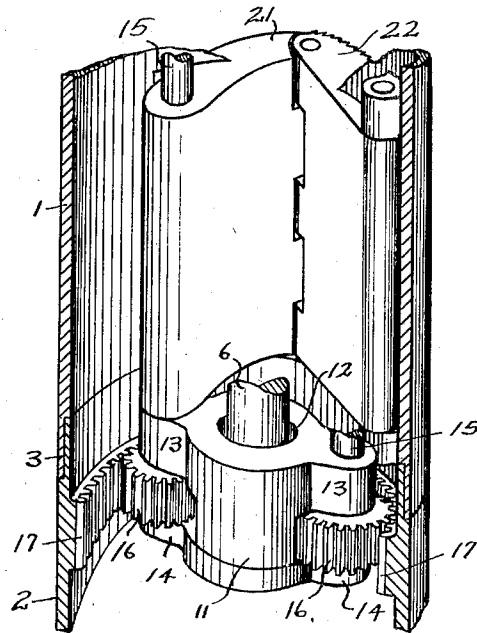


Fig. 4.

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UNITED STATES PATENT OFFICE.

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1,334,487.

Specification of Letters Patent.

Patented Mar. 23, 1920.

Application filed August 4, 1919. Serial No. 315,241.

To all whom it may concern:

Be it known that I, CHARLES R. EDWARDS, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Unscrewing Devices for Pipe-Joints, of which the following is a specification.

This invention relates to new and useful improvements in an unscrewing device for pipe joints.

One object of the invention is to provide a device of the character described adapted for the purpose of unscrewing sections of pipe in a well bore, and withdrawing the same as unscrewed. In drilling wells, a casing is usually let down into the bore as the drilling progresses, and a drill stem operates within this casing. The lower end of the stem carries the bit and the stem is usually rotated from the surface of the ground by means of a rotary. In case the drill stem becomes stuck in the bore and must be withdrawn, it is necessary to unscrew the joints of the stem, one at a time, and withdraw them, and inasmuch as said joints are connected by collars, having right hand threads, in order to unscrew the joints, the sections must be turned backwardly and in order to accomplish this, it is now necessary to employ a string of pipe having left hand threads, to be used in "backing off" or unscrewing the joints of the drill stem to be withdrawn. This invention has been provided for the purpose of unscrewing the joints of the drill stem and withdrawing the same without the use of the left hand threaded string of pipe and is capable of being used in a bore in which the casing is set, or in an open hole, that is, in a hole without casing.

Another object of the invention is to provide a device of the character described which is lighter, simpler and less expensive in manufacture, than those now in common use for a similar purpose.

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, is a vertical sectional view of the device.

Fig. 2, is a transverse sectional view, taken on the line 2—2, of Fig. 1.

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

Fig. 4, is a fragmentary sectional view of the device, and

Fig. 5, is a perspective view of the form of engaging dog employed.

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 the upper section of a tubular inclosed casing employed, and the numeral 2, refers to the lower section thereof, said sections being fitted together so as to form a close fitting joint 3, but being independently rotatable. The upper end of the section 1, is closed by an inwardly extending annular flange 4, having a central bearing 5 in which the shaft 6 rotates. The upper end of this shaft is threaded for engagement with the lower end of a stem through which it may be rotated from the ground surface. The lower end of the shaft 6 is formed with an enlarged head 7, which fits in a corresponding socket 8, in the lower section 2, said head being formed with an enlarged annular flange 9, and a ringlike nut 10 is screwed into said socket 8, against said flange so as to lock the section 2 against displacement from the shaft 6, to permit it to rotate on the shaft. Seated in the section 2, there is a spider 11 through the central bearing 12, of which the shaft 6 extends, and this spider is formed with opposing lugs 13, 13, and 14, arranged on opposite sides thereof and spaced apart, said lugs on each side having aligned bearings to receive the corresponding shafts 15, 15, and between the lugs 13 and 14 on each side, the shafts 15 are formed into spur gears 16, 16, which are in mesh with an annular rack face 17 formed on the section 2. Said spur gears 16 are likewise in mesh with the spur gear face 18, into which the opposing section of the shaft 6 is formed. The upper ends of the shafts 15 are formed into spur gear wheels 19, 19, in mesh with the spur gear 20, into which the opposing section of the shaft 6 is formed. Pivoted on the respective shafts 15 are the elongated levers 21, 21, which work in a corresponding direction and the free ends of these levers have a hinged connection with opposing dogs 22, 22, said dogs being

pivoted at opposing points to the inner wall of the section 1. The operative faces of said dogs are serrated so as to more readily engage with the casing or the wall of the bore.

5 The lower end of the section 2 is reduced forming the outwardly threaded neck 23, which may be screwed directly into the section of pipe to be "backed off" or unscrewed or which may receive a fishing tool of any
10 conventional form for engagement with the pipe.

The device is first attached to a string of pipe whose sections are connected by means of collars having right hand threads, and
15 then let down into the bore until it rests upon the upper end of the section of the stem to be unscrewed. The string to which the device is attached is then turned slowly toward the right as indicated by the arrows
20 in Figs. 2 and 3, which will cause the spur gears 16, 16 to turn toward the left as indicated by the arrows in Fig. 2. The section 2 will be temporarily held against rotation, during this movement, on account of its friction
25 with the section of pipe upon which it is resting, and the section 1 will be held against rotation by reason of its friction with the section 2. The section 1, being thus held, will cause the spur gears 16 to travel around the rack face 17 in the direction indicated
30 by the arrows in Fig. 3, thus forcing the levers 21 and the dogs 22 outwardly through the wide slots 24, 24, which are cut through opposing sides of the section 1, causing the dogs 22, 22, to engage with the casing wall,
35 or in the absence of casing, with the walls of the bore, and the section 1 will thus be firmly held against rotation in the bore. A continued rotation of the shaft 6 will be
40 transmitted through the spur gears 16 and 19 and the shafts 15 to the section 2, turning it in the opposite or left hand direction and causing the same to engage with the adjacent section of the drill stem and rotate
45 the same backwardly, thus unscrewing the same from the sections underneath and when unscrewed, the same may be withdrawn from the bore.

What I claim is:

50 1. A device for unscrewing pipe in a well bore, including two independently rotatable members, a driving shaft, means operatively connecting said shaft with one of said members, whereby the latter may be rotated
55 reversely, with respect to the shaft rotation, and engaging dogs carried by the other mem-

ber and actuated by said means into engagement with the walls of the bore, whereby said last mentioned member is anchored
60 against rotation.

2. A device for unscrewing pipe in a well bore, including an inclosed casing formed of two independently rotatable sections, a driving shaft having bearings in said sections, means operatively connecting said
65 shaft with one of said sections whereby the latter is rotated from the shaft, and engaging members carried by the other section and actuated by said means into engagement with the wall of the bore whereby said last
70 mentioned section is anchored against rotation.

3. A device for unscrewing pipe in a well bore, including a casing formed of two independently rotatable sections, a driving
75 shaft, extending through the casing and having bearings in the respective sections thereof, engaging members carried by one of said sections, means operatively connecting said shaft with said engaging members and
80 with the other section, said means being actuated by said shaft to force said members into engagement with the walls of the bore whereby the first mentioned section is anchored against rotation, and the continued
85 rotation of said shaft thereafter operating through said means to rotate the other section reversely with respect to the direction of the rotation of said shaft.

4. A device for unscrewing pipe in a well
90 bore, including a casing formed of two independently rotatable sections, a driving shaft extending through the casing, engaging dogs carried by one section of the casing, means operatively connecting said shaft
95 with said dogs whereby the rotation of the shaft relative to the casing will actuate said dogs into engagement with the well bore, thereby anchoring said section against rotation, said means being also operatively
100 connected with the other section and operating through the shaft to drive the other section of the casing, reversely with respect to the shaft's rotation when said first mentioned section is anchored against rotation.
105

In testimony whereof he has signed his name to this specification in the presence of two subscribing witnesses.

CHARLES R. EDWARDS.

Witnesses:

IRENE I. BRUNS,
ELLIE MESCHKAT.