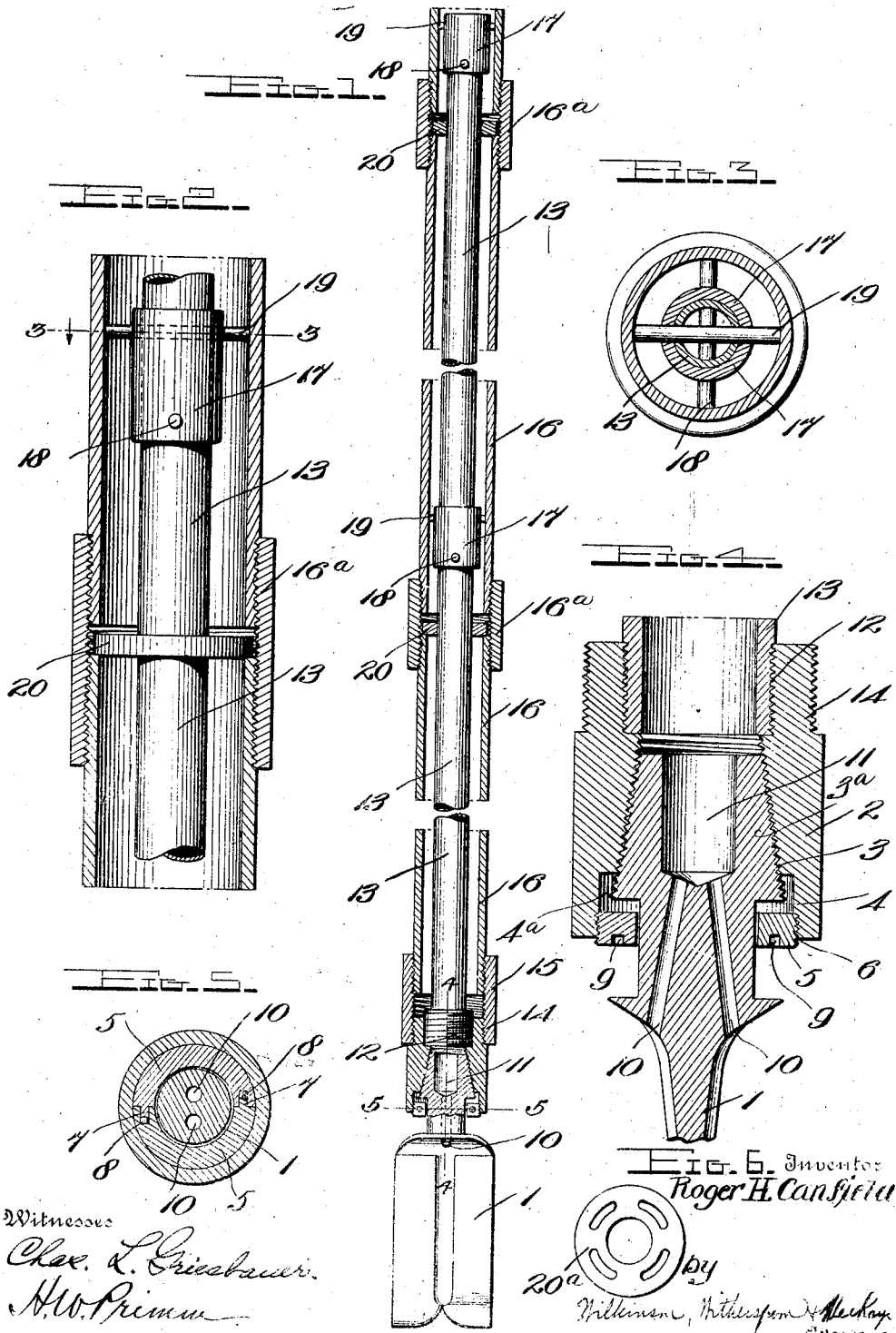


R. H. CANFIELD.
 APPARATUS FOR BORING WELLS.
 APPLICATION FILED DEC. 19, 1912.

1,079,836.

Patented Nov. 25, 1913.



UNITED STATES PATENT OFFICE.

ROGER H. CANFIELD, OF MOORINGSFORT, LOUISIANA.

APPARATUS FOR BORING WELLS.

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Specification of Letters Patent.

Patented Nov. 25, 1913.

Application filed December 19, 1912. Serial No. 737,726.

To all whom it may concern:

Be it known that I, ROGER H. CANFIELD, a citizen of the United States, residing at Mooringsport, in the parish of Caddo and State of Louisiana, have invented certain new and useful Improvements in Apparatus for Boring Wells; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in apparatus for boring wells, and more especially to the apparatus used in boring oil or Artesian wells, which apparatus is required often to pass to a considerable depth, and through strata of widely different hardness and friability.

The apparatus is intended especially to provide means, not only for boring the hole itself, but also for preventing the blocking of the wells, occasioned by the rupture of the boring apparatus, and also to enable the operator to recover any portions of the apparatus that may be so broken off in the well. In practice, it frequently happens that the lower end of the boring appliance is broken off, leaving the bit and contiguous parts in the well; and it is generally difficult, and often impracticable, to recover these broken off portions. Frequently, when a hard stratum is found at a considerable depth, the apparatus is broken off near the bit end, and the well is blocked or spiked, so as to prevent further boring along the same axis, and it is necessary to abandon the well.

My invention also consists in certain improved means for assembling the parts, and in other novel features, which will be hereinafter more fully described and claimed.

Figure 1 shows a central vertical section through the apparatus, the central pipe and bit being shown in elevation, and parts being broken away. Fig. 2 shows a portion of the device of Fig. 1, in a similar section, but on a larger scale. Fig. 3 shows a section along the line 3-3 of Fig. 2, and looking down. Fig. 4 shows a section through the screw head to which the bit is attached, the parts being shown on a larger scale than in Fig. 1, and the section being taken along the line 4-4 of said figure. Fig. 5 shows a cross-section along the line 5-5 of Fig. 1; and Fig. 6 shows a modified form of lifting ring, for use with a solid lifting column.

I show the bit, secured to the head 2 by the tapered shank 3 screw-threaded into the tapered socket 3^a. Said head is also formed with a recess 4^a. The shank of the bit is shouldered as at 4, to engage the screw-threaded ring 5, which is screwed into the threads 6 in the recess 4^a. This split ring is provided with tongues 7, engaging in corresponding recesses 8 in the opposite member, as shown in Fig. 5; and the split ring 6 is preferably provided with spanner holes 9, so as to be screwed into place, when desired. The shank of the bit is provided with passages 10, opening exterior to the blades at the lower end, and at the upper end opening into the chamber 11 in the shank of the bit. The head 2 is interiorly screw-threaded, as at 12, to receive the inner pipe 13; and is exteriorly screw-threaded, as at 14, to engage the screw-threads on the coupling 15, into which is screwed the lower end of the outer or drill pipe 16. Similar couplings 16^a connect the upper sections of the drill pipe, and the sections of the inner pipe are connected by couplings 17, through which pass the spacing pins 18 and 19, which spacing pins serve to keep the inner pipe centered in the drill pipe.

Between the abutting ends of the drill pipe sections, rings 20 are mounted. These rings are loosely mounted in the couplings 16^a, but abut against the ends of the pipe sections, as shown most clearly in Figs. 1 and 2. They are fitted loosely on the sections of the inner pipe 13, but are adapted to engage the ends of the pipe couplings 17, should the inner pipe be pulled through the ring. These rings are slipped over the corresponding section of the inner pipe 13, after it has been put in place, and before the next section of the pipe 16 has been put in place; thus the ring rests on the upper face of the pipe section immediately below. When the next outer pipe section is screwed on, it will hold the ring in the annular space between the two ends of the adjacent pipe sections.

It will be noted that the couplings 17 constitute collars of greater diameter than the inner diameter of the rings 20; so that if any one of the outer pipe sections 16 is broken, as in the operation of drilling, and it be desired to remove the broken portion, by simply pulling up on the outer shell or piping 16, the ring just above the broken away portion will be dragged up to engage

the corresponding lower shoulder of the coupling 17, just above the same; and after a slight lost motion, the drill end of the apparatus can be pulled up, attached to the
5 entire line of piping.

Since it generally happens that the apparatus breaks near the lower end, it will ordinarily be sufficient to carry the inner line of tubing, with the couplings 8, up through a
10 few lengths of the drill pipe 6 only; but this inner line of tubing may be continued up through the entire length of the drill pipe, if desired. This inner column is preferably made in the form of a tube, or pipe, so that
15 water may be carried down to the drill passing through the head thereof, and through the holes 10, into the chamber being bored.

While I preferably use a hollow tube for the inner column, it may be composed of rod
20 sections coupled together by any suitable coupling, such as 17, and secured at its lower end to the head 2, which head, in that case, would be perforated in the usual way, to permit the passage of water therethrough.
25 In such cases, instead of the solid rings 20, perforated rings 20^a should be used, as shown in Fig. 6.

It will be obvious that various changes might be made in the construction, combination, and arrangement of parts, which could
30 be used without departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters
35 Patent of the United States is:—

1. The combination with a drill piping, of a head connected thereto; a bit detachably connected to said head and constructed with a shoulder; and a ring carried by said head
40 and adapted to engage with said shoulder to raise the bit, substantially as described.

2. The combination with a drill piping, of a head connected thereto; a bit detachably connected to said head and constructed with
45 a shoulder; and a split ring detachably con-

nected to said head and adapted to engage with said shoulder to raise the bit, substantially as described.

3. The combination with a drill piping, of a head connected thereto and constructed
50 with a recess; a bit detachably connected to said head and constructed with a shoulder; and a ring fitting within said recess and carried by said head and adapted to engage with said shoulder to raise the bit, substan-
55 tially as described.

4. The combination with a drill piping, of a head connected thereto and constructed with a recess; a bit detachably connected to said head and constructed with a shoulder; and a split ring screw-threaded on said head
60 within the recess thereof and adapted to engage with said shoulder to raise the bit, substantially as described.

5. The combination with a drill piping, of a head connected thereto and constructed with a recess and a tapered socket; a bit having a tapered shank screw-threaded into said
65 socket, and constructed with an annular shoulder; and a split ring screw-threaded
70 into the head recess and carried by said head and adapted to engage with the bit shoulder to raise the bit, substantially as described.

6. The combination with a drill piping, of a head connected thereto and constructed
75 with a recess and a tapered socket; a bit having a tapered shank screw-threaded into said socket, and constructed with an annular shoulder; and a ring comprising sections
80 having inter-engaging tongues and recesses, said ring screw-threaded into the head recess and carried by said head and adapted to engage with the bit shoulder to raise the bit, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

ROGER H. CANFIELD.

Witnesses:

H. T. WEATON,
C. T. GARDNER.