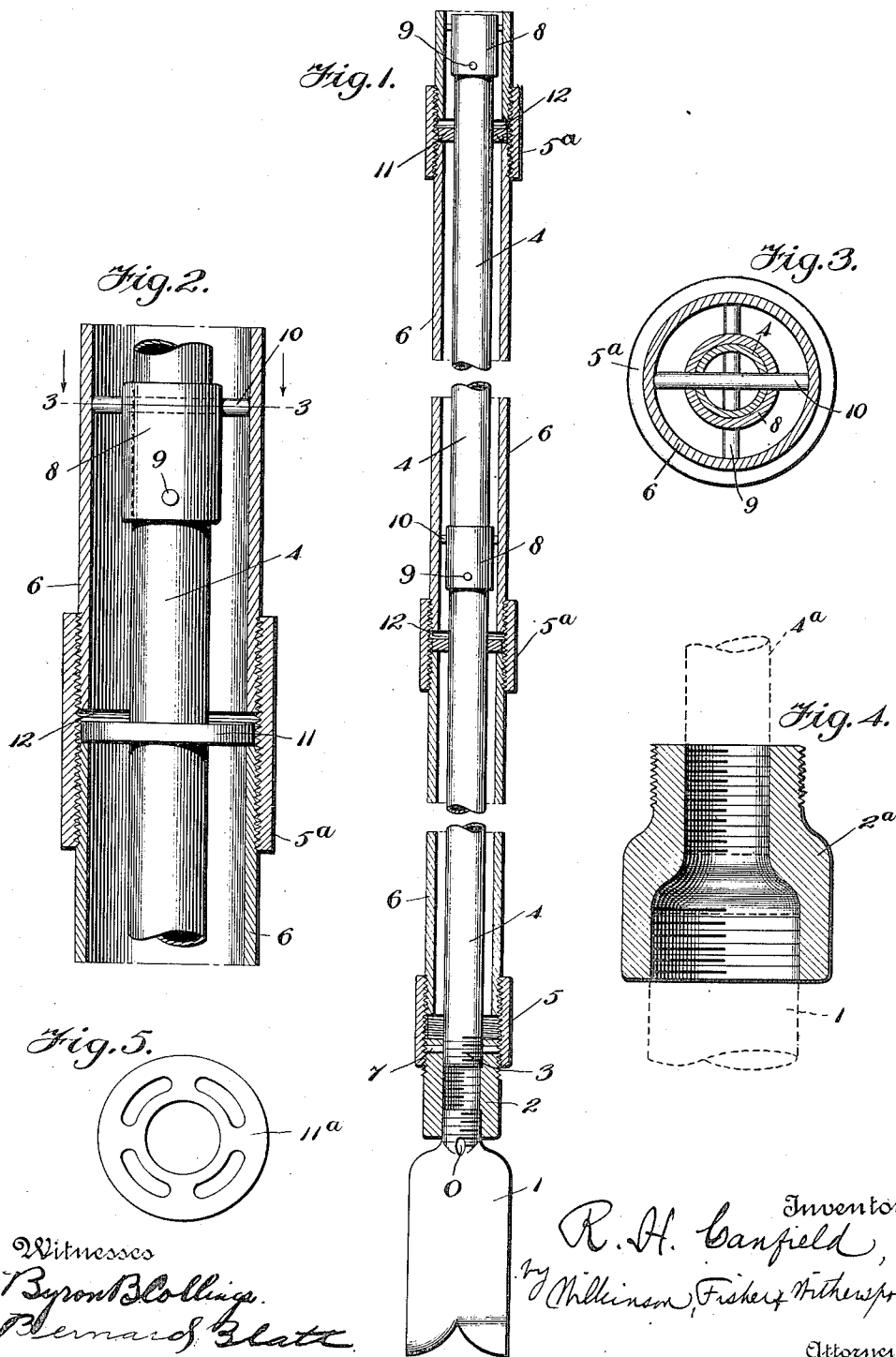


R. H. CANFIELD.
 APPARATUS FOR BORING WELLS.
 APPLICATION FILED OCT. 14, 1911.

1,024,310.

Patented Apr. 23, 1912.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR BORING WELLS.

1,024,310.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROGER HUMPHREY 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, more especially to improvements in the apparatus used in boring oil or Artesian wells, and it is especially intended to provide means for preventing the blocking up of wells occasioned by 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 the usual 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 very difficult, often impracticable, to recover these broken off portions. Frequently they block the well after it has been bored down a considerable depth, thus necessitating the abandonment of the well.

My invention will be understood by reference to the accompanying drawings, in which—

Figure 1 shows a central vertical section through the apparatus, with the inner pipe in elevation. Fig. 2 shows an enlargement of a portion of Fig. 1. Fig. 3 shows a section along the line 3—3 of Fig. 2. Fig. 4 is a detail showing a modified form of screwhead used in attaching the bit, and Fig. 5 shows a modified form of lifting ring.

1 shows the bit secured to the head 2, in the usual way, which head is internally screw-threaded to receive the end 3 of the inner pipe 4, and the head 2 is externally screw-threaded to engage the coupling 5 at the lower end of the drill pipe 6. A number of pipe sections are connected together by similar couplings 5^a, the whole constituting the well known drill pipe; and in the

ordinary practice of drilling, these pipe sections are coupled on as the drill descends, and the parts are rotated in the usual way.

According to my invention, I provide the inner pipe 4, which is screwed into the head 2, and may be locked thereto in any convenient way, as by the pin 7.

The sections of the pipe 4 project slightly above the corresponding sections of the pipe 6, and are coupled together by suitable couplings 8, and also may be locked by cross pins 9 and 10, which pins not only serve to prevent the sections of the inner pipe or tube from becoming unscrewed, but also serve as spacers to center the same in the outer pipe 6. Between the abutting ends of the pipe sections 6, rings 11 are mounted. These rings are slipped over the corresponding section of the pipe 4 after it has been put in place, and before the next section of the pipe 6 has been put in place. Thus the ring rests on the upper face of the lower pipe section. When the next upper pipe section is screwed on, it will hold the ring in an annular space 12 between the two ends of the adjacent pipe sections 6.

It will be noted that the couplings 8 constitute collars of greater diameter than the inner diameter of the rings 11, so that if any one of the pipe sections 6 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 6, the ring just above the broken away portion will be dragged up to engage the corresponding lower shoulder of the coupling 8, and after a slight lost motion the drill end of the apparatus can be pulled up, attached to the entire line of piping.

Since in practice the apparatus generally breaks near the lower end, it will ordinarily be sufficient to carry the inner line of tubing, with the couplings 8, up through a few lengths of the drill pipe 6 only; but it may be continued through the entire length of the drill pipe, if desired. This inner column 4 is preferably made in the form of a tube or pipe, so that water may be carried down to the drill, passing through the head 2 and through the holes O in the drill.

I preferably use a hollow tube for the

inner column, but it might be composed of rod sections coupled together by any suitable coupling, such as 8, 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 there-through. In such case, the rings 11^a should also be perforated, as shown in Fig. 5.

In Fig. 1, I have shown the inner tube 4 as of the same diameter as the screw-threaded head of the bit, so that they both can be screwed in the same threads in the head 2; but if it be desired to use a smaller tube, or a rod smaller than the screw head of the bit, the lower end of the outer pipe 4 may be closed by a screw head, such as 2^a in Fig. 4. Into the enlarged bore in the lower end of this head, the head of the bit 1 is screwed; while into the smaller opening in the upper end of the head 2^a, the rod 4^a is screwed, as shown in dotted lines in Fig. 4.

It will be obvious that various modifications might be made in the herein described apparatus, and in the combination and arrangement of parts, which could be used without departing from the spirit of my invention.

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

1. In a well boring apparatus, the combination with a column of drill piping composed of a series of sections of pipe connected together, of a perforated head attached to the lower end of said column, a bit secured to said head, an inner column secured at its lower end to said head, and means for locking the drill pipe to the inner column, substantially as described.

2. In a well boring apparatus, the combination with a column of drill piping composed of a series of sections of pipe connected together, of a perforated head attached to the lower end of said column, a bit secured to said head, an inner column secured at its lower end to said head, a series of rings mounted between the abutting ends of the drill pipe sections composing the outer column, and a series of collars on the inner column, said rings being adapted to engage said collars, substantially as described.

3. In a well boring apparatus, the combination with a column of drill piping composed of a series of sections of pipe connected together, of a perforated head attached to the lower end of said column, a bit secured to said head, a hollow inner column secured at its lower end to said head, and means for locking the drill pipe to the inner column, substantially as described.

4. In a well boring apparatus, the com-

bination with a column of drill piping composed of a series of sections of pipe connected together, of a perforated head attached to the lower end of said column, a bit secured to said head, a hollow inner column secured at its lower end to said head, a series of rings mounted between the abutting ends of the drill pipe sections composing the outer column, and a series of collars on the inner column, said rings being adapted to engage said collars, substantially as described.

5. In a well boring apparatus, the combination with a column of drill piping composed of a series of sections of pipe, with screw-threaded sleeves connecting said sections together, of a perforated head attached to the lower end of said column, a bit secured to said head, an inner column secured at its lower end to said head and provided with set collars, and means for locking the drill pipe to the inner column, consisting of rings mounted in said sleeves between the ends of said drill pipe sections, said rings being adapted to engage said set collars on said inner column, substantially as described.

6. In a well boring apparatus, the combination with a column of drill piping composed of a series of sections of pipe, with screw-threaded sleeves connecting said sections together, of a perforated head attached to the lower end of said column, a bit secured to said head, an inner column secured at its lower end to said head, and a series of rings mounted between the abutting ends of the drill pipe sections composing the outer column, and a series of collars on the inner column, said rings being adapted to engage said collars, substantially as described.

7. In a well boring apparatus, the combination with a column of drill piping composed of a series of sections of pipe, with screw-threaded sleeves connecting said sections, of a perforated head attached to the lower end of said column, a bit secured to said head, a series of rings mounted between the abutting ends of the drill pipe sections composing the outer column, a hollow inner column secured at its lower end to said head, and set collars on said inner column, adapted to engage said rings and to lock the drill pipe to the inner column, substantially as described.

8. In a well boring apparatus, the combination with a column of drill piping composed of a series of sections of pipe, with screw-threaded sleeves connecting said sections, of a perforated head attached to the lower end of said column, a bit secured to said head, a hollow inner column secured at its lower end to said head, and extending

only a part of the length of the drill piping, and a series of rings mounted between the abutting ends of the drill pipe sections composing the outer column, and a series of
5 collars on the inner column, said rings being adapted to engage said collars, substantially as described.

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

R. H. CANFIELD.

Witnesses:

BERNARD BLATT,
OSCAR W. HELURG.