

C. E. Foster.

Rock Drill.

N^o 46,844.

Fig: 1. Patented Mar. 14, 1865.

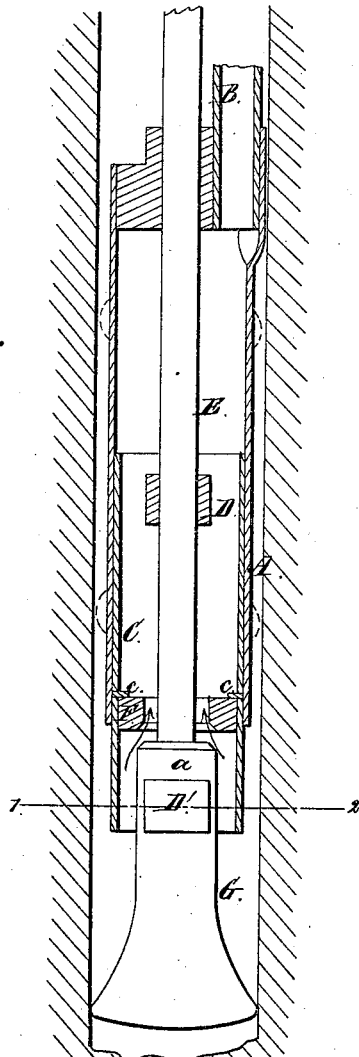
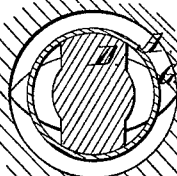


Fig: 2.



Witnesses:

*John H. Hellinghead
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UNITED STATES PATENT OFFICE.

CHARLES E. FOSTER, OF PHILADELPHIA, PA., ASSIGNOR TO ROCK DRILL
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IMPROVEMENT IN WELL-BORING APPARATUS.

Specification forming part of Letters Patent No. 46,844, dated March 14, 1865.

To all whom it may concern:

Be it known that I, CHARLES E. FOSTER, of Philadelphia, Pennsylvania, have invented an Improved Well-Boring Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention consists, first, in a rock drill or cutter combined with certain tubes, substantially as described hereinafter, so that the drill may be operated without the necessity of also moving the tubes, and so that the detritus will be raised into and discharged from the tubes at any desired point; secondly, in certain devices, fully described hereinafter, for operating the drill and discharging the detritus into the tubes.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawing, which form a part of this specification, Figure 1 is a sectional elevation of my improved well-boring apparatus; and Fig. 2 a section on the line 1 2, Fig. 1.

A is a cylindrical casing, which is open at the lower end and closed at the top, the casing being suspended within a well by a series of tubes, of any suitable material, the lowermost tube, B, communicating with the interior of the casing. Within the casing A fits nicely, but so as to slide freely, a second casing, C, which is open at both ends, and across the interior of which extend the cross-pieces D and D'. On the upper side of the cross-piece D' is a cylindrical lug, *a*, into which screws the lower end of a rod, E, the said rod being also secured to the cross-piece D and extending through the top of the casing A. The edge of the lug *a* is beveled, as shown in the drawings, so as to form a seat for the annular valve F, the upward movement of which is limited by pins *c c*. To the cross-piece D' is secured a drill or cutter, G, of any suitable form, and to the upper end of the rod E is attached the end of a rope or rod, which

extends to the top of the well. A reciprocating motion is imparted to the rod or rope connected to the rod E by any suitable apparatus so as to alternately and rapidly raise and lower the casing C, the cutter G being thus brought smartly against the rock so as to cut and break the same. As the rock is cut away the casing C is gradually withdrawn from the casing A, and the detritus is also raised by means of the valve F, into the casings and the tubes B, from which it is discharged at any desired point. When the well has been bored to such a depth that the upper edge of the casing C is within a short distance of the lower edge of the casing A, an additional tube is secured to the uppermost of the tubes B, and the casing A is then lowered until it almost incloses the entire length of the casing C. The operation of the drill is then resumed and continued until the casing A has to be again lowered.

I am aware that drills are used in combination with tubes to which a rapid reciprocating motion is imparted for operating the drill and raising the detritus. This apparatus, however, has been found objectionable when the wells are of great depth, as the excessive weight of the tubes renders it difficult to operate them properly and keep them in order.

It will be apparent that the above-described apparatus effectually obviates these difficulties, that it is simple in its construction and operation, and is not liable to get out of order.

Although I have shown one means of combining the drill with the tubes to raise the detritus through the latter without operating the same, I do not wish to confine myself to this arrangement, as others may be adapted without departing from the main features of my invention—for instance, the drill may be connected to a single cylinder, a tube secured to the top of which projects into and slides in the lowermost of the tubes B.

If desirable, lugs may be secured to the exterior of the casing A to maintain the apparatus concentric with the well.

I claim as my invention and desire to secure by Letters Patent—

1. The drill or cutter G, combined with the

tubes B, and operating substantially as described.

2. The casing A and tubes B, in combination with the casing C, its cutter, rod, and valve, the whole being constructed and operating substantially as and for the purpose specified.

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

CHARLES E. FOSTER.

Witnesses:

JOHN S. HOLLINGSHEAD,
JOHN D. BLOOR.