

A. A. STEEL.
WELL BORING APPARATUS.
APPLICATION FILED JULY 8, 1908.

947,862.

Patented Feb. 1, 1910.

Fig. 1.

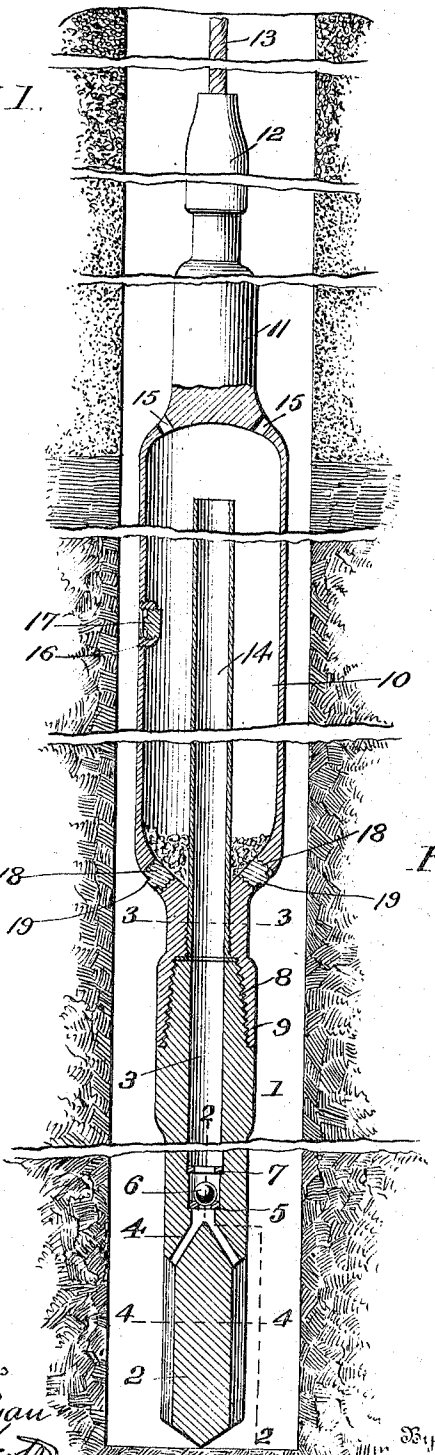


Fig. 2.

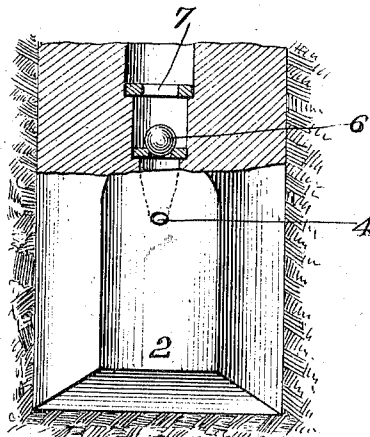


Fig. 3.

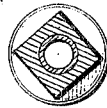
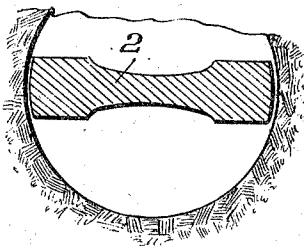


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALVIN ARTHUR STEEL, OF FAYETTEVILLE, ARKANSAS, ASSIGNOR OF ONE-HALF TO
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WELL-BORING APPARATUS.

947,862.

Specification of Letters Patent.

Patented Feb. 1, 1910.

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To all whom it may concern:

Be it known that I, ALVIN ARTHUR STEEL, a citizen of the United States, residing at Fayetteville, in the county of Washington and State of Arkansas, have invented new and useful Improvements in Well-Boring Apparatus, of which the following is a specification.

This invention relates to well boring apparatus, and the object of the invention is to provide an ordinary impact drill with a chamber having a valved communication with the drill bit so as to receive the cutting made by the bit and whereby the geological formation of the strata through which the apparatus passes may be readily removed from the chamber for analytical purposes.

With these and other objects in view which will present themselves as the description progresses, the invention resides in the novel construction and arrangement of parts, hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view, partly in elevation of a well boring apparatus constructed in accordance with the present invention. Fig. 2 is an enlarged sectional view upon the line 2—2 of Fig. 1. Fig. 3 is a horizontal sectional view upon the line 3—3 of Fig. 1. Fig. 4 is a similar view upon the line 4—4 of Fig. 1.

In the accompanying drawings the numeral 1 designates the bit portion of the improved well boring apparatus. This bit 1 is provided with a chisel face 2 at its lower extremity. The chisel face of the bit is provided by sharpening the base whereby when the device is raised and dropped against the strata, in a manner hereinafter to be described, the bottom edge having a cutting or boring effect upon the strata. The side faces of the bit adjacent the sharpened edges thereof are concaved as illustrated in the figures of the drawing, and the upstanding body portion of the bit is provided with a central passage 3. This passage 3 has a Y-shaped port or opening communicating with the concaved sides of the chisel portions of the bit. Immediately above these ports or openings 4 is a valve seat 5, adapted for the reception of a ball valve 6, and the ball valve is prevented from being forced too far away from the valve seat when the bit is reciprocated by

a suitable retaining guard 7. The upper portion of the body of the bit 1 is provided with a reduced threaded nipple 8. This nipple 8 is adapted for the reception of the threaded extremity 9 of a tube member 10. The upper portion of the tube member is provided with a suitable extension 11 having a reduced portion adapted for engagement with a rope socket 12 by which the rope 13, through the medium of which the device is operated, is secured to the apparatus. The chamber 10 is provided with an interiorly arranged vertically upstanding tube 14. This tube 14 is positioned in direct alinement with the opening 3 of the bit 1 and terminates a suitable distance away from the top wall of the chamber. The top wall of the chamber 10 adjacent the extending portion 11 thereof is provided with a plurality of openings 15 which are adapted to serve as an outlet for water drawn within the chamber 10 when the device is operated. The chamber 10 is provided upon its sides with suitable orifices 16 adapted for the reception of plugs 17, and the chamber 10 is also provided with similar threaded openings 18 at its bottom portion adjacent its connection with the tube 14. These openings 18 are adapted for the reception of suitable plugs 19 for a purpose which will hereinafter appear.

The operation of the device is as follows: The apparatus is reciprocated through the medium of the rope 13 so as to cause the impact of the sharpened faces 2 of the bit to bore through the strata, the cuttings caused by the bit, will pass through the ports 4 through the opening provided by the valve seat 5 and through the pipe or tube 14 into the chamber 10. The water will pass through the openings 15 while the cuttings will be deposited within the chamber adjacent the tube 14. When the device is withdrawn from the hole the plug 17 may be removed from the opening 16 and the geological formation of the strata made by the latest strokes of the apparatus readily analyzed. When it is desired to remove all the cuttings the plugs 19 are withdrawn from their connection with the chamber 10 and the cuttings allowed to pass through the openings 19.

While I have illustrated and described the preferred embodiment of the invention as it now appears to me, it is to be understood

that minor details of construction within the following claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

5 Having thus fully described the invention what is claimed as new is:

10 A drill bit having a portion of its sides provided with cutting edges, the bit having a central passage above these cutting edges, each of the sides of the bit being provided with an inclined bore communicating with the passage of the bit, a valve within this passage, a hollow casing connected with the bit, a central tubular member within the

casing and communicating with the passage 15 of the bit, the chamber having its lower portion rounded and provided with threaded apertures, threaded closures for these apertures, the body of the casing being also provided with openings, closures for these 20 openings, and the top of the casing being also provided with a plurality of openings.

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

ALVIN ARTHUR STEEL.

Witnesses:

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H. E. RODGERS.