No. 735,767. PATENTED AUG. 11, 1903.

P. HIGGINS.

ROCK DRILL.

APPLICATION FILED OCT. 6, 1902.

NO MODEL.

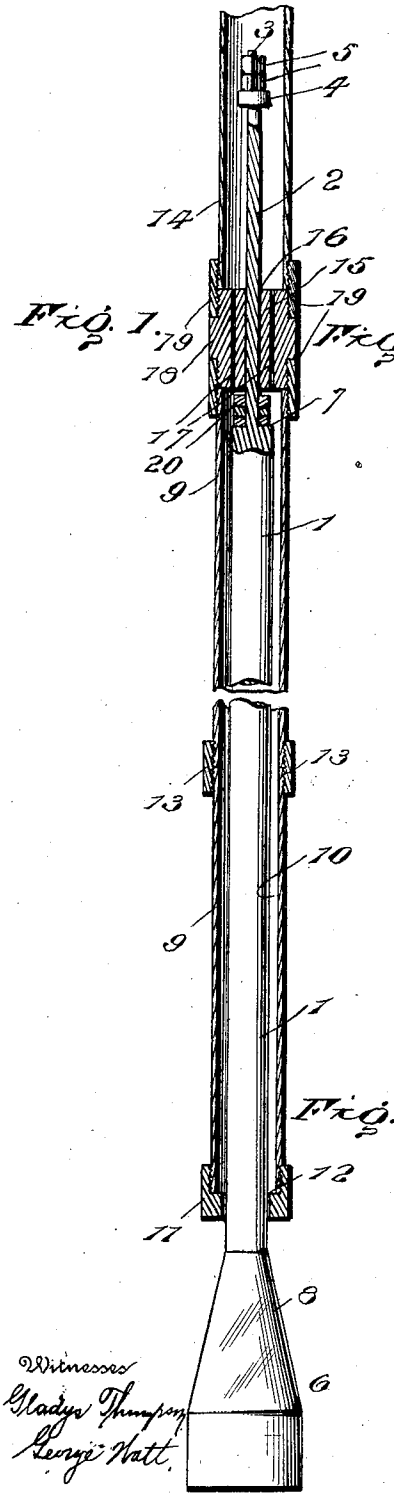


Fig. 1.

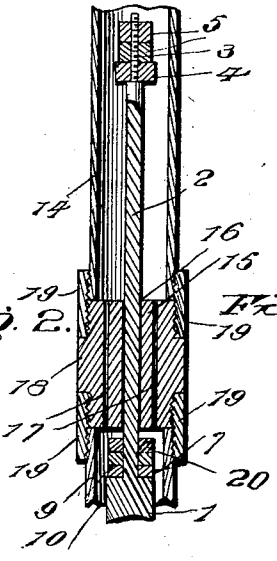


Fig. 2.

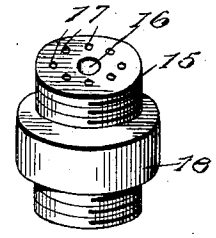


Fig. 3.

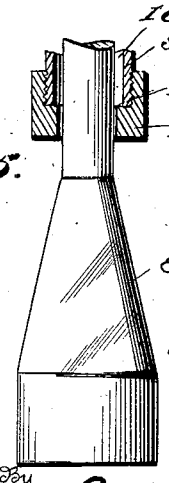


Fig. 5.

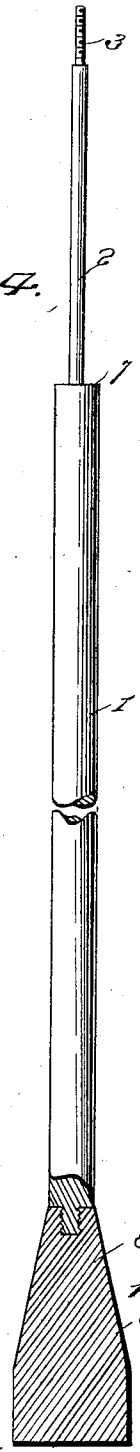


Fig. 4.

Witnesses
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 735,767. Patented August 11, 1903.

UNITED STATES PATENT OFFICE.

PATTILLO HIGGINS, OF BEAUMONT, TEXAS.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 735,767, dated August 11, 1903.

Application filed October 6, 1902. Serial No. 126,188. (No model.)

To all whom it may concern:

Be it known that I, PATTILLO HIGGINS, a citizen of the United States, residing at Beaumont, in the county of Jefferson and State of Texas, have invented certain new and useful Improvements in Rock-Drills, of which the following is a specification.

This invention relates to apparatus for drilling and boring deep wells for oil, water, or gas, the purpose being to simplify, cheapen, and hasten the operation of penetrating rock formation, whereby as a result the cost of drilling a deep well is materially lessened.

The invention consists of the novel features, details of construction, and combination of the parts which hereinafter will be more fully described and finally claimed; and for this purpose and also to acquire a knowledge of the merits of the invention and the structural details of the means whereby the results are attained reference is to be had to the appended description and the drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical central section of the drill-barrel, lower end of the tubular drill-rod, and the separator and guide-head, showing the drill in full, an intermediate portion of the drill and its barrel being broken away. Fig. 2 is an enlarged section of the separator and guide-head and the contiguous parts. Fig. 3 is a perspective view of the separator and guide-head. Fig. 4 is a side view of the drill, having a detachable point, the end portions being in section. Fig. 5 is a detail section of the lower end of the drill-barrel and drill.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The drill 1 is provided at its upper end with a stem 2, whose upper portion is reduced and threaded, as shown at 3, for the reception of a collar 4 and jam-nuts 5, the latter securely confining the collar 4 against the shoulder formed at the base of the reduced terminal portion 3. The drill may be of any length, diameter, and weight, depending upon the character of the work, and its point 6 may be integral or detachable, the latter construction admitting of a variety of points being used in connection with the drill-body, the joint between the point and the drill-body being of substantial formation, so as to withstand the work and strain to which the tool is subjected when in use. The collar 4 constitutes a stop, and the shoulder 7 at the base of the shank 2 constitutes a second stop, and these stops determine the relative play or effective stroke of the drill. The part of the drill-point adjacent to the body of the drill is made tapering, as shown at 8, so as to offer the least resistance to the passage of the water employed for washing out the particles of stone and the like resulting from boring or drilling through the rock formation.

The drill-barrel 9 is of less diameter than the drill-point, so as to leave an annular space between it and the wall of the well or bore for the outflow of the water and drillings. The barrel is of a length to receive the body portion of the drill and admit of reciprocation of the same therein. A space 10 is formed between the drill and the drill-barrel for the passage of the water employed for flushing the well, so as to carry off the loose particles. A collar 11 is fitted to the lower end of the drill-barrel and its lower end is thickened and inwardly flanged to form a reinforcement which underlaps the end of the said barrel 9, an annular space 12 being provided between the thickened portion of the collar and the drill for the escape of the water used in flushing the well during the drilling operation. The drill-barrel may be a single tube or comprise a number of tubes or sections coupled together by sleeves 13 or other means.

The drill-rod 14 is tubular and may be composed of any number of sections coupled together in any determinate way to admit of lengthening and shortening the drill-rod, as may be required. The drill-rod is coupled to the drill-barrel in any selected way, preferably by means of the device shown, which performs the double office of a separator and guide, the same consisting of a head or plug 15, centrally apertured at 16 to receive the shank 2 and having a series of openings 17 around the central opening 16 for the passage of the water from the drill-rod into the drill-

barrel. The central portion of the part 15 has an annular enlargement 18 of a diameter to come flush with the outer sides of the coupling-sleeves 19, connecting the end portions of the part 15 with the adjacent ends of the drill-rod and drill-barrel. The extremities of of the part 15 abut against the ends of the respective parts 14 and 9, and the terminal portions above and below the annual enlargement 15 are exteriorly threaded to receive the coupling-sleeves 19, by means of which the drill-rod, part 15, and drill-barrel are connected.

A well-drilling apparatus embodying the invention is adapted to be operated by the usual actuating mechanism, whereby the drill is elevated the required distance and released, so as to instantly fall and deliver the full force of the blow upon the rock formation to be pierced. In the present instance the operating rope or cable is adapted to be connected with the drill-rod, and the latter when elevated lifts the drill by contact of the part 15 with the collar or stop 4. The downward movement of the drill-rod is gaged so as to prevent jar thereto by contact of the part 15 with the shoulder 7. Water is supplied to the drill-rod from any suitable source by means of a hose-pipe, which is coupled to the upper end of the drill-rod, and the water passes from the drill-rod into the drill-barrel through the opening 17 of the separator and guide-head 15 and after passing around the drill through the annular space 10 escapes from the barrel through the annular space 12 and floods the well and carries off the drillings, thereby facilitating the work, as it is not necessary to remove the drill to clear the well of the fragments or particles of detached rock. The stroke of the drill may be regulated to a certain extent by slipping washers upon the shank 2 below the part 15, as shown at 20.

Having thus described the invention, what is claimed as new is—

1. In well-drilling apparatus, the combination of a drill-barrel, a plug arranged within the drill-barrel and provided with a guide and intercommunicating openings, a drill slidably mounted within the barrel and spaced from the inner walls thereof, and having a shank fitted in the guide-opening of the plug, and stops at the ends of the shank for engagement with opposite ends of the aforementioned plug in alternation, the distance between said stops being regulable to vary the sliding movement between the drill and drill-barrel, substantially as described.

2. In well-drilling apparatus, the combination of a drill-barrel, a tubular drill-rod, a plug connecting the two and having a guide and other openings, a drill slidable within the said barrel and spaced from the inner walls thereof, and having a shank fitted in the guide-opening of the plug, a collar at the upper end of the said shank and washers removably fitted upon the lower end of said shank, substantially as specified.

3. In well-drilling apparatus, the combination of a drill-barrel, tubular drill-rod, a drill mounted for reciprocal movement within the barrel and having a shank provided at opposite ends with stops, a combined separator and guide interposed between the extremities of the rod and barrel and having its middle portion formed with an annular enlargement, and coupling-sleeves connecting the end portions of said separator and guide with the adjacent ends of the said rod and barrel, the said separator and guide having a central opening to receive the shank of the drill and other openings for the passage of water from the drill-rod to the drill-barrel, substantially as set forth.

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

PATTILLO HIGGINS. [L. S.]

Witnesses:
W. M. CROOK,
C. R. KENUM.