No. 894,147. PATENTED JULY 21, 1908.

W. HUTCHINGS.

DEEP WELL DRILL.

APPLICATION FILED JULY 9, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

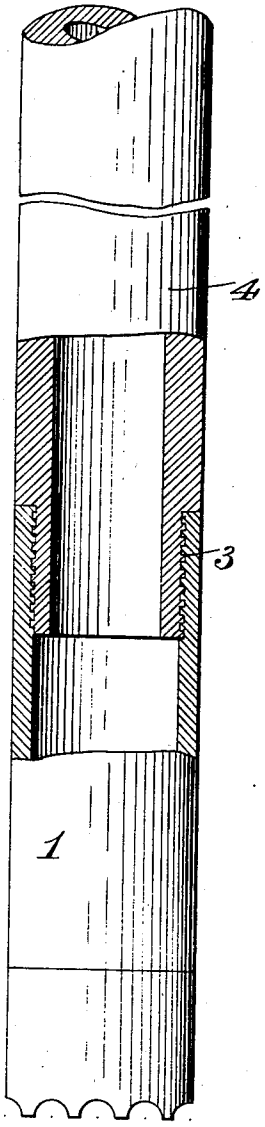


Fig. 3.

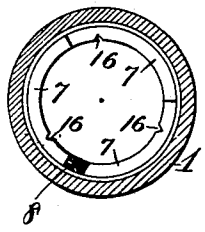


Fig. 4.

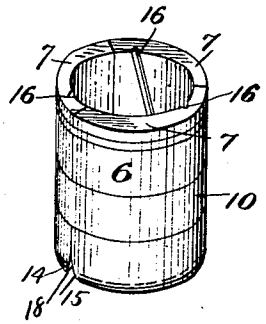


Fig. 8.

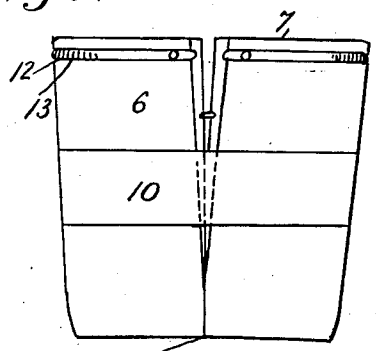
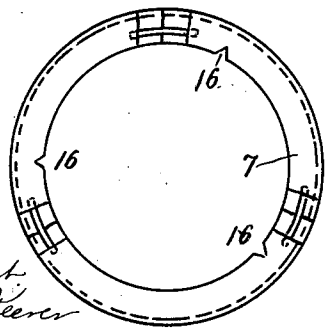


Fig. 7



Witnesses:
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2 SHEETS—SHEET 2.

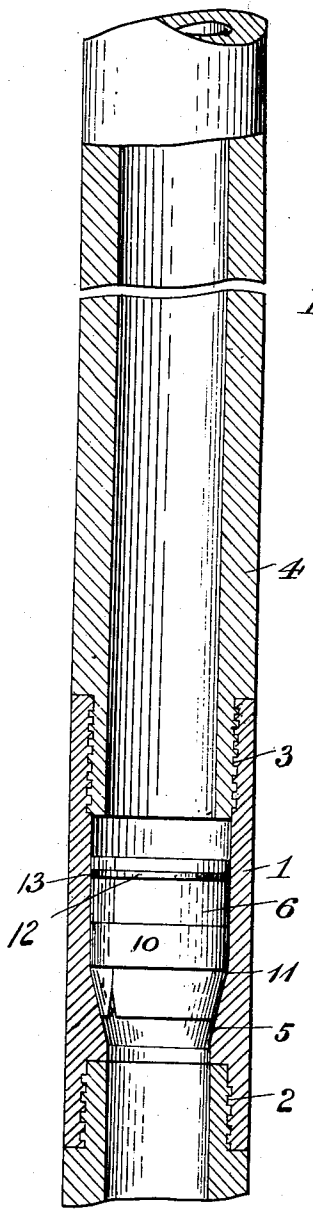


Fig. 2.

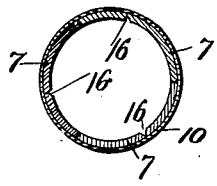


Fig. 5.

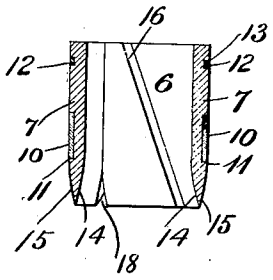


Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM HUTCHINGS, OF ISHPEMING, MICHIGAN.

DEEP-WELL DRILL.

No. 894,147. Specification of Letters Patent. Patented July 21, 1908.

Application filed July 9, 1906. Serial No. 325,368.

To all whom it may concern:

Be it known that I, WILLIAM HUTCHINGS, a citizen of the United States, residing at Ishpeming, in the county of Marquette and State of Michigan, have invented certain new and useful Improvements in Deep-Well Drills, of which the following is a specification.

My invention relates to improvements in drills, more especially for boring to great depths, through rock or minerals.

Its object is to provide for readily and effectively withdrawing or lifting the resulting core, and to accomplish the same in a simple, advantageous and expeditious manner.

Said invention consists of certain structural features or instrumentalities substantially as hereinafter fully disclosed and particularly pointed out by the claims.

In the accompanying drawing illustrating the preferred embodiment of my invention—Figure 1 is a side elevation of a drill of the character herein referred to, with parts broken away. Fig. 2 is a sectional elevation, parts also being broken away. Fig. 3 is a horizontal or transverse section of the contrivance. Fig. 4 is a detached perspective view of the core grappling or gripping device. Fig. 5 is a transverse section of the same, produced through the main spring-metal band for the retention of the sections of the core-grappling device in yielding relation one to the other. Fig. 6 is a vertical sectional view of the core lifter; Fig. 7 is a top plan view of the core lifter in the position when gripping the core, and Fig. 8 is a view in side elevation of the core lifter showing the sections in the position when gripping the core.

In carrying out my invention, I employ the shell or tube 1 having produced upon its inner surface near or at the lower end internal screw-threads 2 for the application or attachment thereto of the usual mineral or rock boring bit, which, however, need not be referred to further herein, not forming any part of the claimed invention. Said shell or tube has also upon its inner surface, near or at the upper end, additional internal screw-threads 3, with which engagement is effected by a screw-thread ended hollow drill-rod 4 (only a broken portion of which is shown) of any required length and reaching from the drill-actuating machine at the surface. Said sleeve or tube has also upon its inner surface, an internal beveled surface or shoulder 5, with its base offset or terminating at a point just above the lower screw-threaded surface 2 and flared or diverging upward.

A grappling or gripping contrivance 6, which may be termed the "core-lifter", is adapted to be introduced and supported within the shell 1, upon the shoulder 5, for receiving and engaging the forming core during the drilling or boring operation. Said "core-lifter", tubular or cylindric in its general outline, is composed generally of a number of sections or members 7, say three equipped with engaging pins and sockets 8, along their meeting edges, and encompassed at its center about, by a split spring-metal clasp or band 10, let into a correspondingly shaped shallow recess or groove 11 produced in said clasp-sections, which clasp is also effective to permit of the expansion and contraction of said "core-lifter" according to conditions as presently made known. A supplemental split clasp 12 of spring-metal wire is also let into a like-shaped groove 13 formed in the sections of the "core-lifter" 6, near the upper edge of the latter. Said "core-lifter" sections 7 are chamfered or beveled at their lower ends or edges, both upon the inner and outer surfaces thereof as at 14, 15, and have their lower ends reduced or tapered as at 18, 18 whereby the adjacent edges are capable of rocking upon each other. To provide for the ready entrance of the forming core into the "core-lifter", and for the ready seating of the latter into the beveled or upward flared shoulder 5 upon the interior of the shell or tube 1, respectively, this latter taking place, of course, when the drill is lifted or elevated, as more fully made apparent later. The reduced ends 18 of the sections permit them to rock upon each other as the core is forced up into the sections, and the tube 1 is then drawn upward causing the sections to be drawn down upon the flared shoulder 5 and causing the sections to grip the core. The lower ends of the sections will tend to grip the core tighter and the reduced ends will permit the sections to have a rocking action, and the upper ends of the sections to spread, thereby giving a better gripping action on the core. Said "core-lifter" sections are provided upon their inner surfaces with diagonal grooves 16 extending in the direction of their lengths, and which are preferably V-shaped in cross-section, and which serve to aid the "core-lifter" in effectively gripping the core.

In operation, the "core-lifter" will, as the forming core initially enters the shell 1 and passes above the shoulder 5, rise sufficiently from its seat in the latter, to allow the core to requisitely spread the sections of said "core-lifter" for its entrance thereinto, the screw-threaded connection between the drill rod and said shell limiting the upward displacement of said "core-lifter", thus allowing the forming core to readily rise or pass upward through the latter during the boring operation. Upon the conclusion of said operation and as the shell and all are lifted or pulled upward, it will be noted that the weight of the core closely embraced by the "core-lifter" will re-seat the latter which will thus result in effecting a gripping action between the "core-lifter" and the core, and that close down to the lower end thereof, allowing the removal wholly, practically, of the core, the desirability of which is apparent, and which obviates great trouble and delay in crushing the large unremoved portion of the core as experienced by the means heretofore employed for that purpose.

I claim—

1. A well drill comprising a tube member adapted to be connected to the drill or drill rod, said tube member being constricted at one end forming a beveled surface, an adjustable core lifter made in sections received in the tube member, and the sections having the lower meeting edges or faces tapered whereby the adjacent edges are capable of rocking upon each other.

2. A well drill, comprising a tube member adapted to be connected to the drill and drill rod, said tube member being constricted at one end forming a beveled surface, an adjustable core lifter made in sections received in the tube member, pin and socket connections for connecting the sections together, and having diagonal grooves in the inner surface of the sections adapted to engage the core.

3. A well drill comprising a tube member adapted to be connected to the drill and drill rod, said tube member being constricted at one end forming a beveled surface, an adjustable core lifter made in sections received in the tube member, pin and socket connections for connecting the sections together, said sections having the lower meeting edges or faces tapered forming rocking surfaces at the adjacent edges, and having diagonal grooves in the inner surface of the sections.

4. A well drill comprising a tube member adapted to be connected to the drill and drill rod, said tube member being constricted at one end forming a beveled surface, an adjustable core lifter made in sections received in the tube member, said sections having the lower meeting edges tapered whereby the adjacent edges are capable of rocking upon each other, and diagonal grooves in the inner surface whereby a greater gripping action can be obtained on the core.

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

WILLIAM HUTCHINGS.

Witnesses:

W. C. McWHIRTER,

J. C. McGILVERY.