

DRILL.

Patented Aug. 15, 1911.

2 SHEETS—SHEET 1.

Technical drawing of a mechanical device, likely a valve or actuator, showing a cross-section and a side view. The device features a central vertical shaft (18) with a handle (11) and a lever (12). The handle is connected to a central shaft (14) which passes through a housing (13). The housing has a top flange (19) and a bottom flange (4). The central shaft is surrounded by a series of seals or gaskets (6, 7, 8, 9). The device is mounted on a base (3).

Fig. 1.

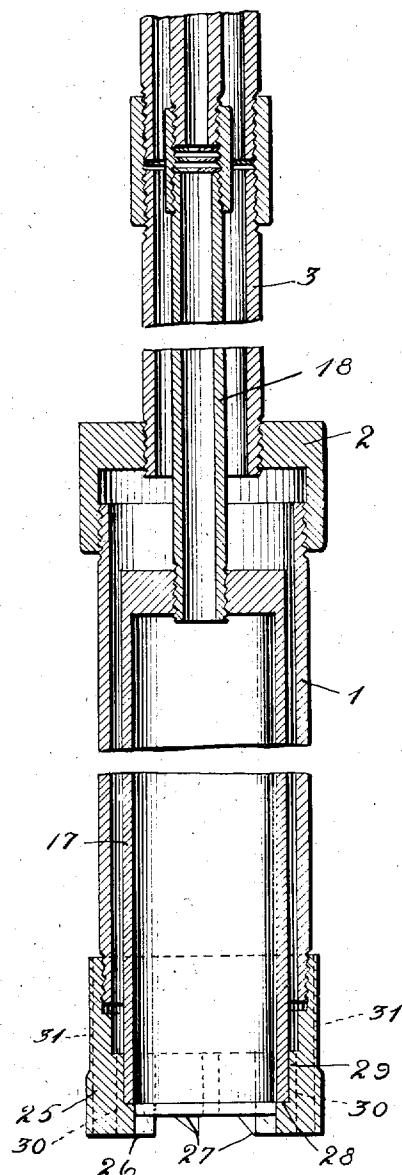


Fig. 1^a

Witnesses

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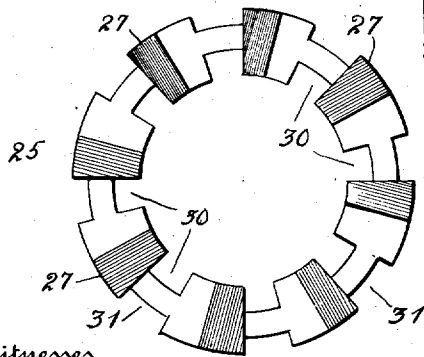
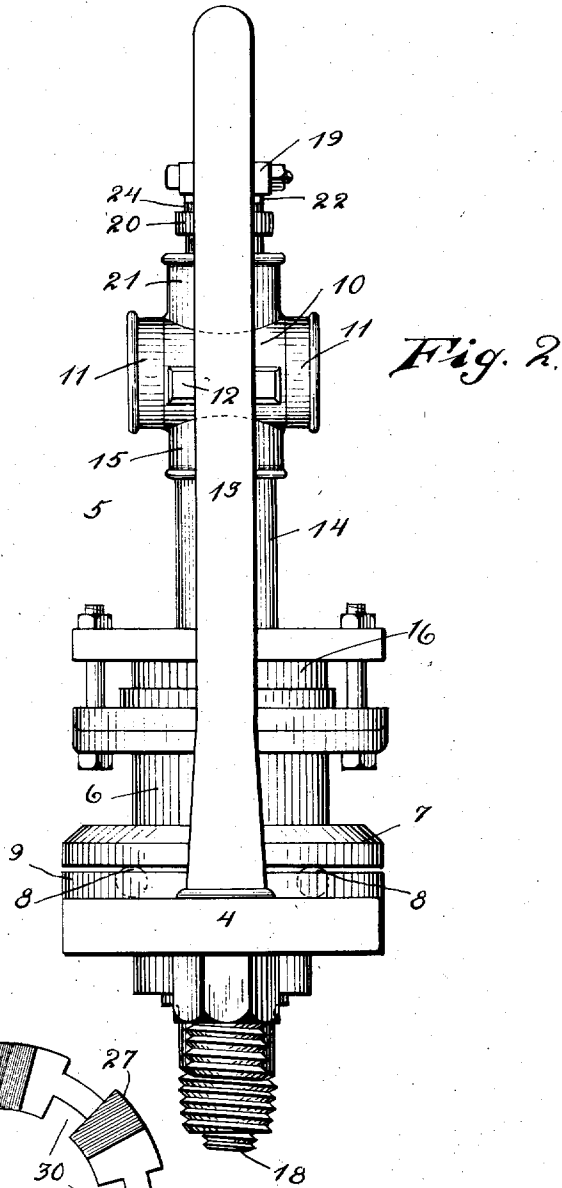
DRILL.

APPLICATION FILED MAR. 28, 1911.

Patented Aug. 15, 1911.

2 SHEETS—SHEET 2.

1,000,778.



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LEE CANFIELD, OF SPARTA, WISCONSIN.

DRILL.

1,000,778.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed March 28, 1911. Serial No. 617,431.

To all whom it may concern:

Be it known that I, LEE CANFIELD, a citizen of the United States, residing at Sparta, in the county of Monroe and State of Wisconsin, have invented certain new and useful Improvements in Drills, of which the following is a specification.

My invention relates to rock drills of the type having tubular stocks and annular bits to leave a central core in the boring and has for its object the provision of a barrel inside of the tubular drill stock to receive the core, the drill stock and core barrel being so mounted on a specially designed water swivel that the barrel is held from rotation while the drill stock is freely movable on the swivel. By this construction the core is kept in its original condition so that the geological formation of the boring may be determined, after the drill has been removed from the boring and the core from the barrel.

My invention will be described in detail hereinafter and illustrated in the accompanying drawings in which—

Figure 1, is a central vertical sectional view of the upper portion of my improved drilling apparatus. Fig. 1^a, a similar view of the lower portion thereof, Fig. 2, a side view in elevation of the water swivel and upper portion of the drill stem, and Fig. 3, an end view of the annular drill bit.

In the drawings similar reference characters will be used to indicate corresponding parts in the several views.

1 indicates the tubular drill stock having a threaded cap 2 on its upper end and tubular stem 3 secured to said cap and revolutely mounted in the base plate 4 of water swivel 5 by means of tubular connection 6 keyed to bearing plate 7 that is mounted on anti-frictional bearings 8 shown as balls in Fig. 1, which are in turn mounted in raceway ring 9 in the upper side of base plate 4.

10 indicates the water connection consisting of a cross shaped tubular member, as shown, having laterally extending arms 11 with projections 12 that engage the arms of inverted U-shaped supporting member 13.

14 indicates a pipe, secured to the downwardly extending branch 15 of water connection 10, that fits in tubular connection 6, 16 indicating a packing gland secured in the upper end of tubular connection 6 but

permitting rotation of the tubular connection 6 and drill stem around the pipe 14.

17 indicates the core barrel mounted in drill stock 1 having a rod 18 secured in its upper end that extends through stem 3, pipe 14 and water connection 10, and is held from rotary movement by being secured between clamping bars 19 engaging supporting member 13.

20 indicates a packing gland mounted on the upper branch 21 of water connection 10 to prevent the water from running out around the rod 18.

22 indicates a plate secured to arms 11 by means of bolts 23 and having a projection 24 thereon that engages packing gland 20 to hold it in position in branch 21.

25 indicates the rotary cutting shoe that is secured to the lower end of tubular drill stock 1, said cutting shoe being formed, as shown, with an annular cutting face 26 having beveled cutting teeth 27. The inner surface of the cutting shoe 25 is formed with a shoulder 28 on which the lower end of core barrel 17 is seated, and an annular projection 29 to evenly space the lower end of the core barrel from the inner face of the cutting shoe 25.

30 indicates grooves in the inner face of the shoulder 28 and annular projection 29, and 31 grooves in the outer surface of the cutting shoe to permit the circulation of water around the cutting face 26 to carry off the drillings.

In operation the drill is suspended by the supporting member 13 and is rotated in any suitable manner, the anti-frictional bearings 8 permitting the drill to rotate without rotating supporting member 13 and base plate 4 of water swivel 5. As the core barrel 17 is secured to the supporting member 13 by means of rod 18, secured between clamping bars 19, it will be held from rotation so that the core left by the drill will not be disturbed by rotation of the barrel and its integrity will remain unimpaired, and it may be removed from the barrel for examination to determine the geological formation of the boring.

Having thus described my invention what I claim is—

1. In combination with a water swivel, a tubular drill stock, a tubular stem secured to said stock and rotatably mounted on the swivel, a water connection mounted on the

swivel and communicating with said stem, a core barrel mounted in the drill stock, a rod secured to the core barrel and extending through the drill stem and water connection aforesaid, and means to secure the rod to the swivel to prevent rotation of the core barrel.

2. In combination with a water swivel comprising a base plate and a supporting member secured to said plate, a tubular drill stock, a tubular drill stem secured to said stock and rotatably mounted in said base plate, an anti-frictional bearing interposed between said base plate and drill stem, a core barrel mounted in the drill stock, a rod secured to said barrel and extending through said drill stem, and clamping bars engaging said rod and the supporting member of the water swivel aforesaid.

3. In combination with a water swivel

comprising a base plate, and a supporting member secured to said plate, a tubular drill stock, a tubular drill stem secured to said stock and rotatably mounted in said base, an anti-frictional bearing interposed between said base plate and drill stem, a water connection mounted on the swivel and communicating with the drill stem, a core barrel mounted in the drill stock, a rod secured to said barrel and extending through the drill stem and water connection aforesaid, and bars engaging said rod and the supporting member of the water swivel.

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

LEE CANFIELD.

Witnesses:

R. B. GRAVES,

JESSIE SHATTUCK.

Correction in Letters Patent No. 1,000,778.

It is hereby certified that in Letters Patent No. 1,000,778, granted August 15, 1911, upon the application of Lee Canfield, of Sparta, Wisconsin, for an improvement in "Drills," an error appears in the printed specification requiring correction as follows: Page 2, line 24, after the word "base" the word *plate* should be inserted; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of September, A. D., 1911.

[SEAL.]

F. A. TENNANT,

Acting Commissioner of Patents.

swivel and communicating with said stem, a core barrel mounted in the drill stock, a rod secured to the core barrel and extending through the drill stem and water connection aforesaid, and means to secure the rod to the swivel to prevent rotation of the core barrel.

2. In combination with a water swivel comprising a base plate and a supporting member secured to said plate, a tubular drill stock, a tubular drill stem secured to said stock and rotatably mounted in said base plate, an anti-frictional bearing interposed between said base plate and drill stem, a core barrel mounted in the drill stock, a rod secured to said barrel and extending through said drill stem, and clamping bars engaging said rod and the supporting member of the water swivel aforesaid.

3. In combination with a water swivel

comprising a base plate, and a supporting member secured to said plate, a tubular drill stock, a tubular drill stem secured to said stock and rotatably mounted in said base, an anti-frictional bearing interposed between said base plate and drill stem, a water connection mounted on the swivel and communicating with the drill stem, a core barrel mounted in the drill stock, a rod secured to said barrel and extending through the drill stem and water connection aforesaid, and bars engaging said rod and the supporting member of the water swivel.

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