A. SHILAND.

COMPOUND REVOLVING ROCK DRILL.

No. 46,949. Patented Mar. 21, 1865.

Fig. 1.

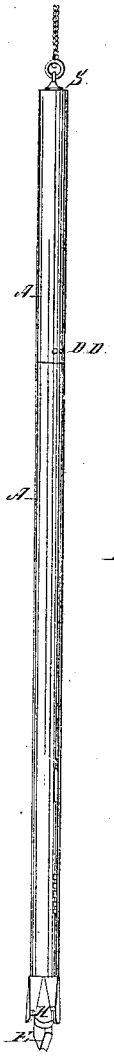


Fig. 5.

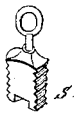


Fig. 6.

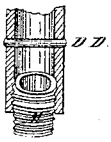


Fig. 7.

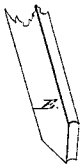


Fig. 3.

Fig. 8.

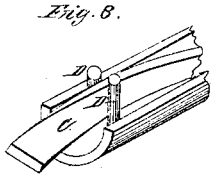


Fig. 9.

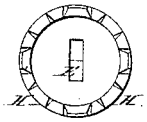


Fig. 10.

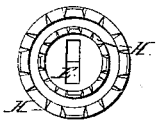
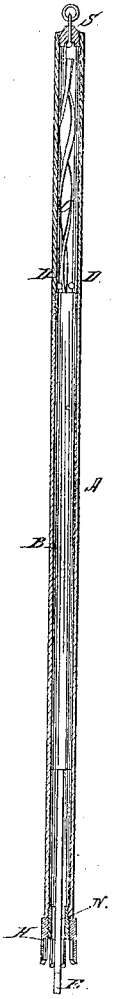


Fig. 4.

Fig. 2.



Witnesses:
Henry Loddell
R. A. Reilly

Inventor:
Alexander Shiland

UNITED STATES PATENT OFFICE.

ALEXANDER SHILAND, OF WEST TROY, NEW YORK.

IMPROVEMENT IN DRILLS.

Specification forming part of Letters Patent No. **46,949**, dated March 21, 1865.

To all whom it may concern:

Be it known that I, ALEXANDER SHILAND, of West Troy, in the county of Albany, in the State of New York, have invented a new and useful Improvement in the Rock-Drill for Oil Wells or Deep Borings, which I denominate the "Compound Revolving Drill;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification.

Figure 1 is an exterior view. Fig. 2 is a section of the same. Fig. 3 is the upper part of tube. Fig. 4 is the lower part. Fig. 5 is the swivel. Fig. is the hollow nut in connection with parallel bars. Fig. 7 is drill-head of shaft. Fig. 8 is spiral bar and parallel bars. Figs. 9 and 10, drill-heads.

This drill is composed of the outer tube, A, with the parallel bars D D, the drill-head H, the swivel S, the tubular screws or hollow nuts M and N, and the inner shaft, B, with the spiral part C of the shaft B, and the drill-head E.

I elongate the upper end of the tube A above the spiral part C of the inner shaft, B, and introduce a cylinder adapted to play within, being shorter than the space of the elongation of the tube. A smaller bar is screwed into this cylinder and passes through a hollow screw in the upper end of the tube, and is attached to the rope by which the drill is lifted. The hollow of the screw in the end of the tube is smaller than the cylinder, and forms a shoulder, against which it strikes, thus acting as a swivel and a jar to the tube. The hollow of the tube A is made sufficiently large to admit of the free play of the shaft B, and is also slotted or perforated, to allow the free passage of muddy water, which might obstruct the action of the drill. This tube is constructed in two parts, which are connected by the hollow nut M. The caliber of this screw is smaller than the tube A and the body of the shaft B, thus limiting the action of this above, while a similar nut, N, limits its action below, and also serves to hold the drill-head H, which is screwed on it till it rests against the end of tube A.

The parallel bars D D permit the passage of the flat spiral bar C by its narrowest dimensions only, and thus necessitates the counter-revolving motion of the tube and inner shaft as they act upon each other in the rising and falling of the drill against the rock.

The drill-head E is formed of a flattened bar, which is spear-shaped and grooved at the lower end, in order to form two edges, which correspond with the flat surface on either side. The double edges so formed are best adapted to operate upon the rock with the revolving shaft. A double head may be made—one in place of the nut N, the other screwed on this or over the end of the tube.

The tubular drill-head H is adapted to screw on the hollow nut N or the end of the tube A, and its lower end is divided into prongs, with open spaces between, and alternately inclined inward and outward, in order to give the least obstruction to the water or mud through which it passes in its descent to the rock. The prongs are sharpened in such a manner that their cutting-edges act in concentric circles. The inner prongs are longer than the outer prongs.

In working the drill, the tube A, being lifted by the rope attached to the swivel S, causes the shaft B to revolve while it remains in contact with the rock until the body of the shaft rests on the nut N and is carried up to the height of the stroke. In descending, the head of the shaft striking the rock in advance becomes partially fixed by the concussion, and a revolving motion is communicated to the tube A as it descends to the rock. The inner shaft, B, and tube A act alternately upon each other as the drill is raised or dropped in a perpendicular direction against the rock. The velocity of the revolution is determined by the force of the concussion.

This drill differs essentially from any drill which is rotated by a force above ground acting on an inflexible bar connected with the drill. With this drill the revolving motion is effected without such inflexible bar, and is caused by the reciprocal action of the inner shaft, B, and outer tube, A, when the drill is lifted and dropped.

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

The combination of the tube A with the inner shaft, B, having the spiral part C acting between parallel bars, segments, or grooves, these parts or their equivalents arranged and operating as and for the purpose set forth.

ALEXANDER SHILAND.

Witnesses:

HENRY LOBDELL,

R. H. REILLEY.