G. FRISBEE.

Rock-Drill.

No. 168,010. Patented Sept. 21, 1875.

Fig: 1

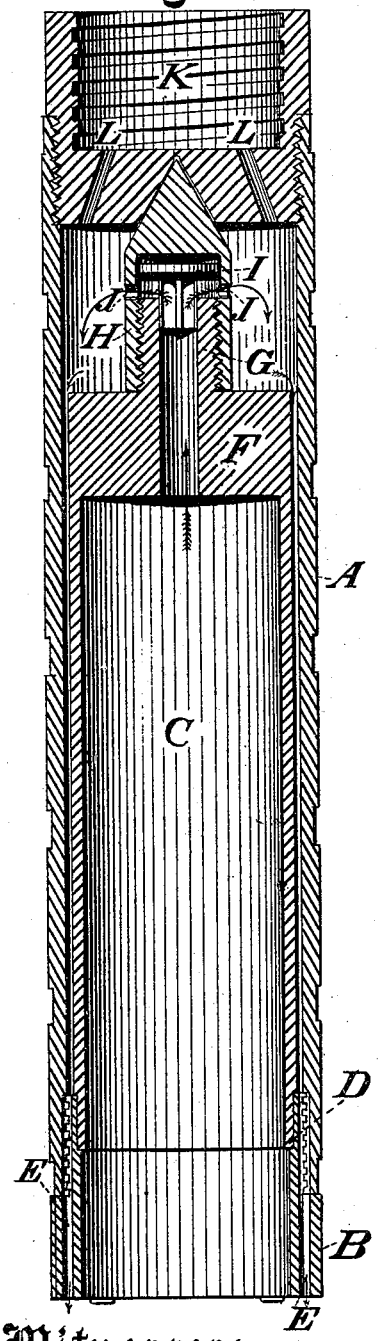


Fig: 2

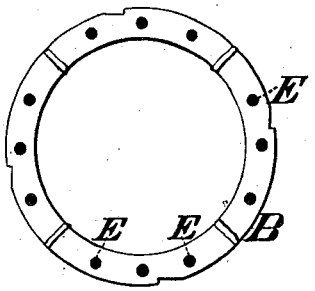


Fig: 3

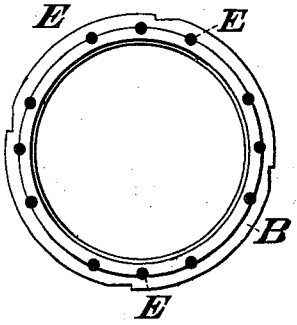
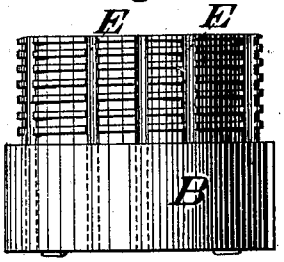


Fig: 4



Witnesses:

John Evarding

J. Bonsall Taylor.

Inventor:

Gideon Frisbee,

by his Atty,

Horace Binney.

UNITED STATES PATENT OFFICE.

GIDEON FRISBEE, OF READING, PENNSYLVANIA.

IMPROVEMENT IN ROCK-DRILLS.

Specification forming part of Letters Patent No. **168,010**, dated September 21, 1875; application filed September 9, 1875.

To all whom it may concern:

Be it known that I, GIDEON FRISBEE, of Reading, in the county of Berks and State of Pennsylvania, have invented a new and useful Improvement in Rock-Drills; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a vertical section of my improvement, taken through the axis of the drill. Fig. 2 is a bottom view, showing the face of the bit. Fig. 3 is a plan or top view of the bit or boring-head, and Fig. 4 is an elevation of the bit or boring-head.

The same parts are denoted by the same letters in all the figures.

This invention is an improvement in that class of machines which cut a core out of the rock by means of a continuously-revolving and progressing annular diamond bit combined with a tubular rod through which water passes to lubricate the diamonds and wash away the detritus. Its object is the complete preservation of the core, which, when of soft material, is liable to be washed away by the water; and to this end the said invention consists of the combination, with an inner barrel, of an annular bit, and a hollow drill-rod or outer barrel, which bit or outer barrel, or both, are constructed with channels through which water passes to the diamonds without coming into contact with the core at any point. It also consists in the combination, with a hollow drill-rod or outer barrel, of an inner barrel constructed with a relief-valve which permits water to escape from the inner barrel while the drill is at work, but excludes air and water during the withdrawal of the core; and it further consists in the combination, with the said inner and outer barrels and relief-valve, of certain subordinate devices hereinafter described.

A in the drawing represents the outer barrel or lowest section of the tubular drill-rod. Into the lower extremity of A is screwed the annular diamond bit B. C is the inner core-barrel, whose lower end projects into the bit B and rests on a shoulder, D, on the inner surface of the bit. There is also a shoulder on C, which rests on the top of the bit, as shown in Fig. 1. The bit B is perforated with channels E E opening into its face. The upper part of these channels consists of grooves cut in the screw-thread on the upper part of the bit, and the corresponding thread in the barrel A has grooves cut in it to match those in the bit. The grooves, both in the bit and barrel, are a little deeper than the thread. F is a hollow plug, which closes the top of the core-barrel C, and whose upper part, G, forms a stem, over which is screwed the cap H. I is the relief-valve, which moves vertically in the hollow stem G. J J are perforations in the cap, by which the space above the plug communicates with the space in the cap above the relief-valve, or, when said valve is raised, (as shown in Fig. 1,) with the interior of the barrel C. K is a coupling which closes the barrel A near the top, and is made with perforations L L, by which the spaces above and below said plug communicate. In the lower part of K is a recess into which the conical top of the cap H fits, so that the outer barrel may revolve freely around the inner one.

The operation of these devices is as follows: While the bit is advancing into the rock and cutting out a core, water is forced or passed from the interior of the drill-rod, through the passages L L, into the annular space between the barrels A and C. Through the channels E E, which open into that space, the water passes thence to the face of the bit, so as to lubricate the diamonds and wash away the detritus in the usual manner without coming into contact with the core at any point. Any water that may have entered the inner barrel is permitted to escape, by the relief-valve, into the space above the plug F. When the drill is withdrawn from the bore-hole the relief-valve closes, thereby preventing the admission of air or water to the top of the inner barrel, and allowing the core to be held in its place by friction against said barrel and by atmospheric pressure.

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

1. The combination, with an inner barrel, of an annular bit and a hollow drill-rod or outer

barrel, when either the bit or the outer barrel, or both, are constructed with channels, substantially as described.

2. The combination, with a hollow drill-rod or outer barrel, of an inner barrel constructed with a relief-valve, operating substantially as described.

3. The combination, with the inner and outer barrels and the relief-valve, of the coupling K, stem G, and cap H, all constructed and arranged substantially as described.

GIDEON FRISBEE.

Witnesses:
D. E. NICE,
C. LITTLE.