

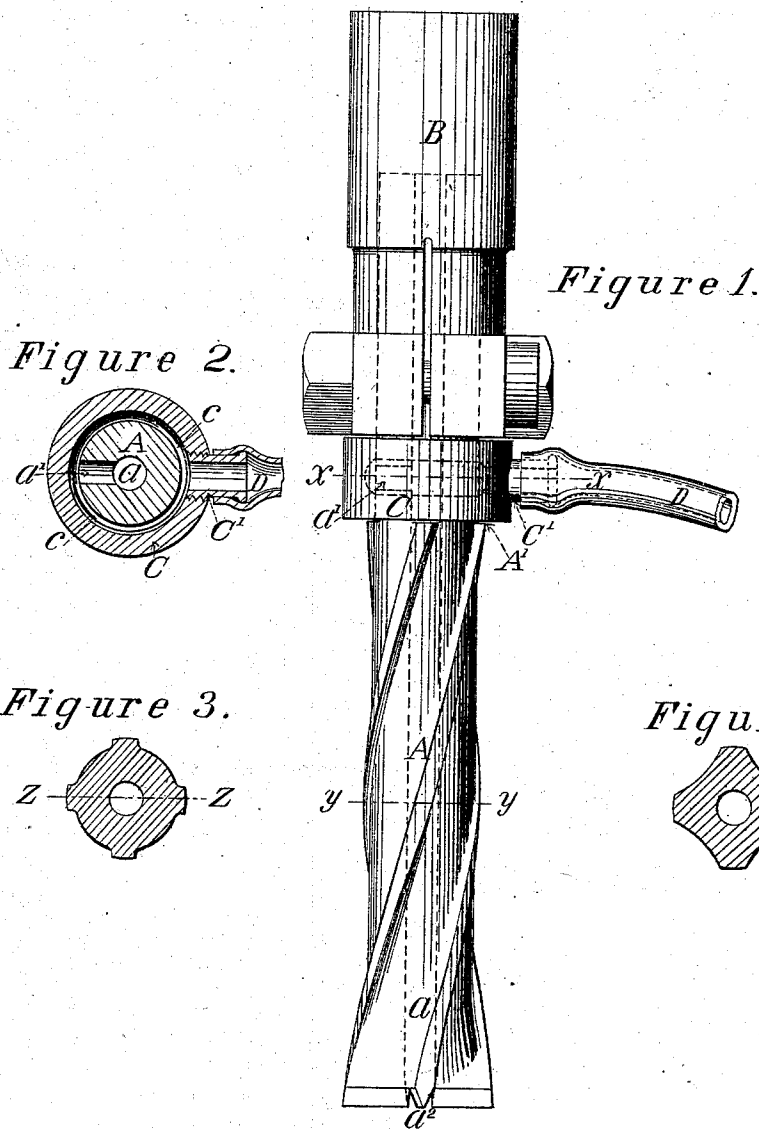
(No Model.)

H. BORCHARDT.

ROCK DRILL.

No. 291,568.

Patented Jan. 8, 1884.



Witnesses
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UNITED STATES PATENT OFFICE.

HUGO BORCHARDT, OF NEW YORK, N. Y., ASSIGNOR TO THE PARSONS
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ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 291,568, dated January 8, 1884.

Application filed June 20, 1881. Renewed July 20, 1883. (No model.)

To all whom it may concern:

Be it known that I, HUGO BORCHARDT, of the city and State of New York, have invented Improvements in Rock-Drills, of which the following is a specification.

My improvement relates especially to the class of drills used for drilling rock in which the work of boring is done by successive blows of the drill; and my invention consists in the peculiar construction and in the combination of parts, as more fully hereinafter described and claimed.

The accompanying drawings, representing a drill embodying my invention, are as follows:

Figure 1 is an elevation of my improvement represented as being clamped in a chuck and provided with a device for supplying it with water. Fig. 2 is a transverse section through the line $x x$ on Fig. 1. Fig. 3 is a transverse section through the line $y y$ on Fig. 1; and Fig. 4 is a transverse section, showing a modification in the exterior form of the tubular drill.

The drawings represent a drill, A, made of a tubular bar of steel, and clamped at its upper end in the chuck B of a steam rock-drill. The hole a extends longitudinally through the center of the drill-bar A, preferably from one end to the other. The upper portion of the drill is turned in cylindrical form to fit the end of the chuck B, and also to form a shoulder, A', for the support of the loose collar C. The interior of the collar C is provided with the annular recess c , and a hole is tapped in its periphery to form the nozzle C', upon which the end of the flexible pipe D is secured. Water introduced through the pipe D makes its way through the perforated nozzle C' into the annular recess c , and thence into the interior of the hollow drill through the hole a' tapped laterally through the drill-bar, as shown in dotted lines in Fig. 1 and in longitudinal section in Fig. 2.

The cutting end of the drill is upset in the usual way, in order to enlarge its diameter, and is formed into four cutting-chisels resembling, but for the absence of metal in the face, the drill commonly used.

In the act of upsetting the metal, as will be

seen, the lower end, a' , of the tube a is slightly diminished in diameter. This upsetting of the metal has two advantages besides enlarging the diameter of the drill: It slightly closes up the lower end of the water-channel and condenses the metal at the cutting-edges, thus making it better fitted for standing the shocks to which it is subjected when in operation.

The advantages of partially closing in the bottom of the hole are that the acting face of the drill can be larger, and, the hole being smallest at the point where the drill comes in contact with the rock, nothing can get into the hole that will stop the passage of the water downward, because, should a small piece of stone get accidentally into the hole, the next blow would drive it into the larger part of the channel, where the water could readily pass it.

The drill may be made of any desired shape in cross-section. The form shown in Fig. 3 is, however, that which I have found specially convenient in practical use and easy to produce. Another form which may be used is shown in Fig. 4. Both of these forms have the advantage of leaving metal extending beyond the body of the drill, on which the exterior edges of the cutters of the drill can be formed. The ribs also form shoulders to keep the collar C in position, the latter being held between the ends of the ribs and the chuck B. In manufacturing my drill I adopt the method employed in rolling gun-barrels, by rolling skelps of steel upon a mandrel, using for the finishing operation two rollers having grooves corresponding in shape to the cross-section of either half of the exterior of Fig. 3 above or below the dotted line $z z$.

Except when water is injected into the drill, it is not essential to the practice of the main part of my invention that the hole a shall extend entirely through the drill, nor that water or other liquid shall be injected into the hole a . A central hole extending only a short distance inward from the working-face of the drill will impart those advantages of my invention which consist in the facilitation of the tempering operation and the increase of the durability and working capacity of the drill. Such

a comparatively shallow hole or recess might be formed by boring out the center of the drill-bar to any desired depth.

I am aware of the English Patent No. 3,012 of 1878, and make no claim to anything shown therein.

I claim as my invention—

10 1. A drilling-tool having spiral external ribs and a longitudinal central channel, the said channel terminating at the junction of cutting-edges formed on the face of said drill upon the continuation of said ribs, and said cutting-edges extending inward to decrease the diameter of the channel and outward to

the extremities of said ribs to increase the act- 15 ing parts of the tool, substantially as specified.

2. A drilling-tool having a central longitudinal channel, *a*, connecting with a transverse water-way, *a'*, and having external flanges or ribs extending lengthwise of the 20 drill, forming bearing-shoulders, combined with a collar, *C*, resting on said ribs, having annular water-chamber *c* and pipe-connections thereto, as set forth.

HUGO BORCHARDT.

Witnesses:

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