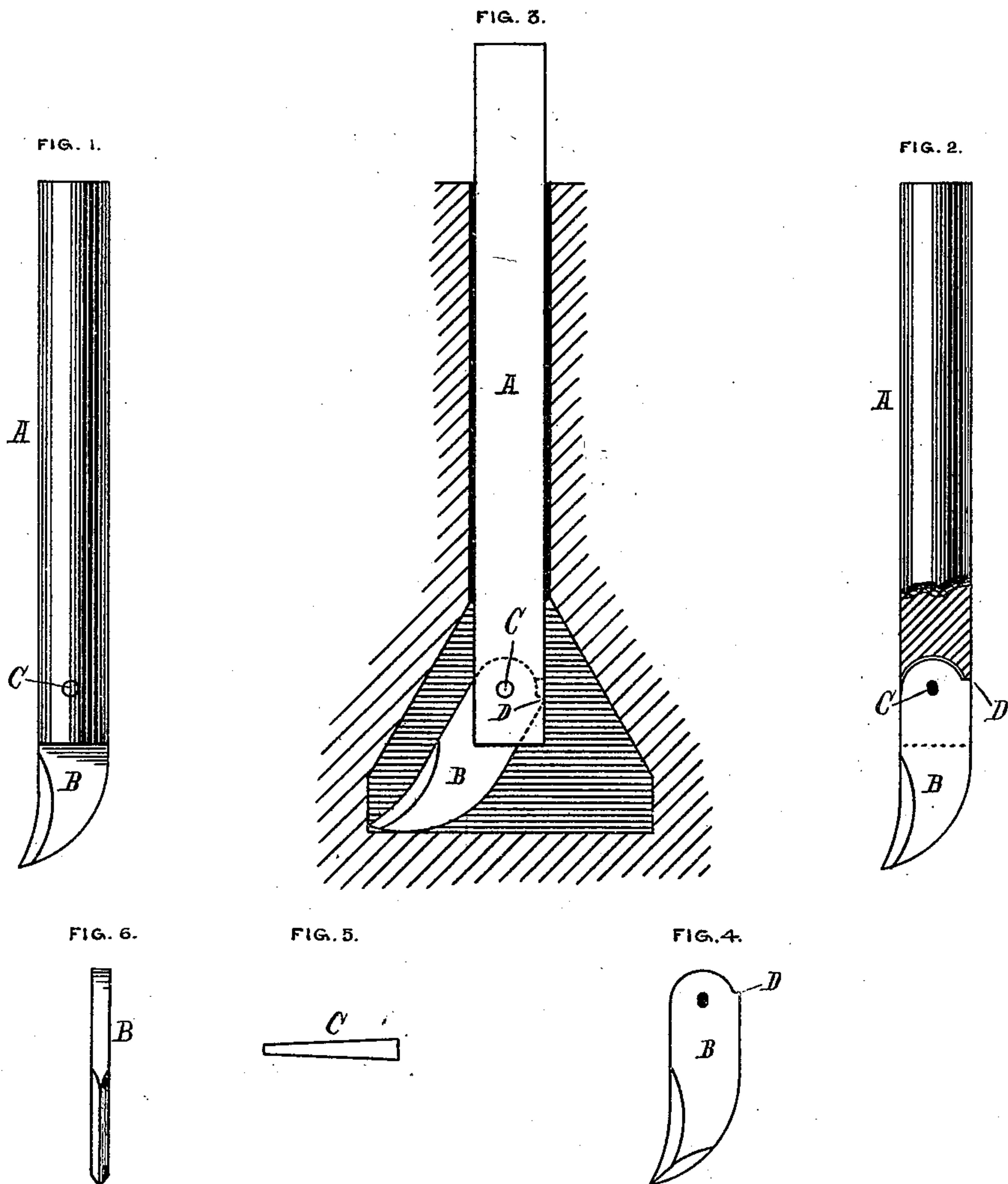


J. A. COWLES.
Rock Drill.

No. 230,863.

Patented Aug. 10, 1880.



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Witnesses
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UNITED STATES PATENT OFFICE.

JAMES A. COWLES, OF CHICAGO, ILLINOIS.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 230,863, dated August 10, 1880.

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To all whom it may concern:

Be it known that I, JAMES A. COWLES, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rock-Drills, of which the following is a full and exact description, reference being had to the accompanying drawings and letters of reference thereon.

Similar letters refer to similar parts in the different drawings.

Figure 1 represents the drill ready for use. Fig. 2 represents the drill with a portion of the lower end of the mandrel removed to show the position of the knife B in the mandrel. Fig. 3 shows the drill in the rock in position and ready for work. Fig. 4 is a view of the knife B. Fig. 5 is an enlarged view of the pin holding the knife B in position in the mandrel A. Fig. 6 is a front edge view of the knife B.

A is the mandrel, made of the requisite length and size, of iron or steel. At the lower end is a slot cut, in which fits the knife B. The upper end or head of this slot is made concave, as shown in Figs. 2 and 3. The upper end of the knife B is made oval to fit the concave form of the head of the slot.

D is a shoulder made on the knife B, and fitting against a corresponding one at one side of concave surface in the slot in the mandrel A, as shown in Figs. 2 and 3.

C is the pin holding the knife B in position in the mandrel. It is made conical in form, as shown in Fig. 5, so that it may be readily tightened in place, and so that it may be adjusted to compensate for wear and readily removed when desired.

The knife B is made with the edge all at one side of the center, or of the point through which the pin C passes to unite it with the mandrel A, and the back or side opposite the cutting-edge is made oval, similar in form to the blade of a common pocket-knife, terminating in a point at one side of the point of attachment with the mandrel.

The hole in the knife through which the pin C passes is made oblong, so as to admit of a little play to the knife.

The knife works freely in the slot in the mandrel, and is chamfered off at the cutting side, as shown in Figs. 1, 2, and 3; and, if desired, it is chamfered at both sides near the point, as shown in Fig. 4.

The operation is as follows: The hole is first

drilled by any of the well-known instrumentalities to the requisite depth. This drill is then inserted and the sledge-hammer is used, or it is churned as any ordinary drill. Not quite so heavy a blow is used as in the original drilling of the hole. The knife B being loosely attached to the mandrel in the slot, and the lower point and the cutting-edge of the knife being at one side of the point of union between it and the mandrel, and the back of the knife being oval, when a blow is struck on the upper end of the mandrel, the knife B cuts all at one side, as shown in Fig. 3.

The shoulder D prevents the knife B swinging back, so as to allow the point to come under or within the direct line of the force of the blow, but on the contrary always keeps the point to one side of this line of the force of the blow. This fact, together with the oval shape of the back of the knife, always insures a side cut, which enlarges or chambers out the lower end of the hole.

When it is desired to extend downward to a greater or less extent the enlarged part of the hole after the enlargement is made with the drill shown in Fig. 1, the drill originally used in drilling the hole is inserted, and the drill-hole, if the size of the original drill, is sunk below the enlarged or chambered part of the hole a short distance—from a quarter to half an inch. It is then removed, when I introduce my improved undercut drill and enlarge this extended drill-hole to the size of the enlarged or chambered part of the hole. This can be done as often as desired, and thus the enlarged or chambered part can be carried down as far as desired.

The head of the slot, being made concave to fit the oval shape of the end of the knife D, always furnishes a bearing for the end of the knife, whether its position is as shown in Figs. 2 or 3, and thus relieves all strain upon the pin C.

I claim—

The herein-described rock-drill, consisting of the mandrel A, having a concave slot and shoulder, the oval-shaped knife B, having oblong slot and shoulder, and centrally secured to the mandrel by the conical pin C, the several parts constructed and relatively arranged to operate substantially as specified.

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