

G. KOCH.
Well-Drills.

No. 144,550.

Patented Nov. 11, 1873.

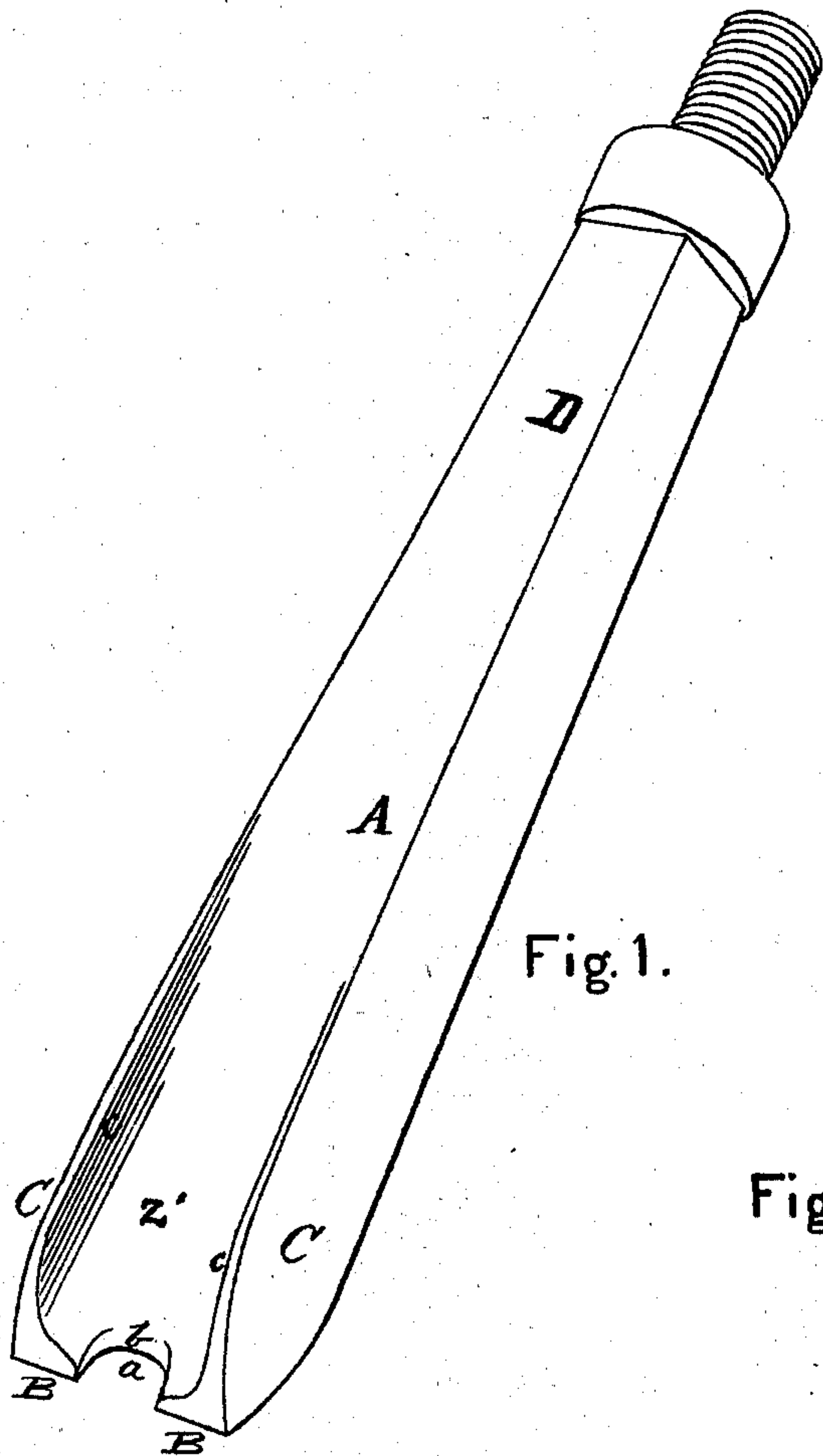


Fig. 1.

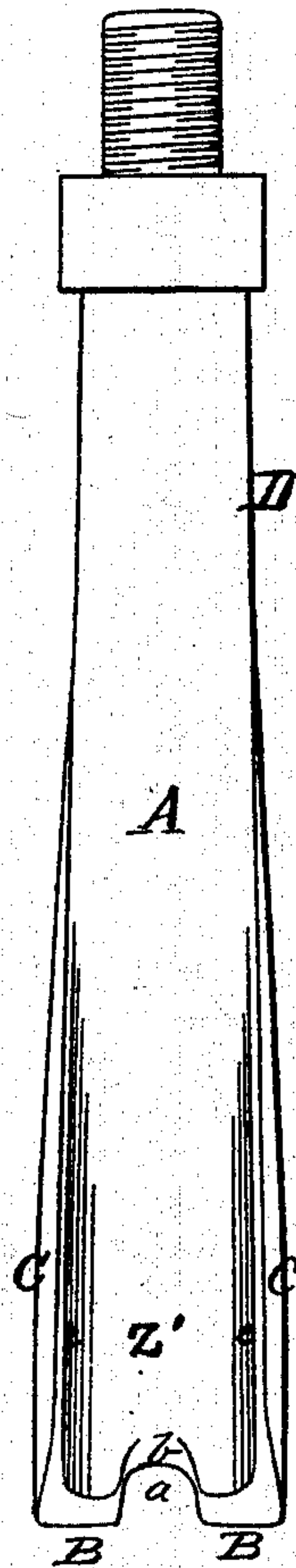


Fig. 2.

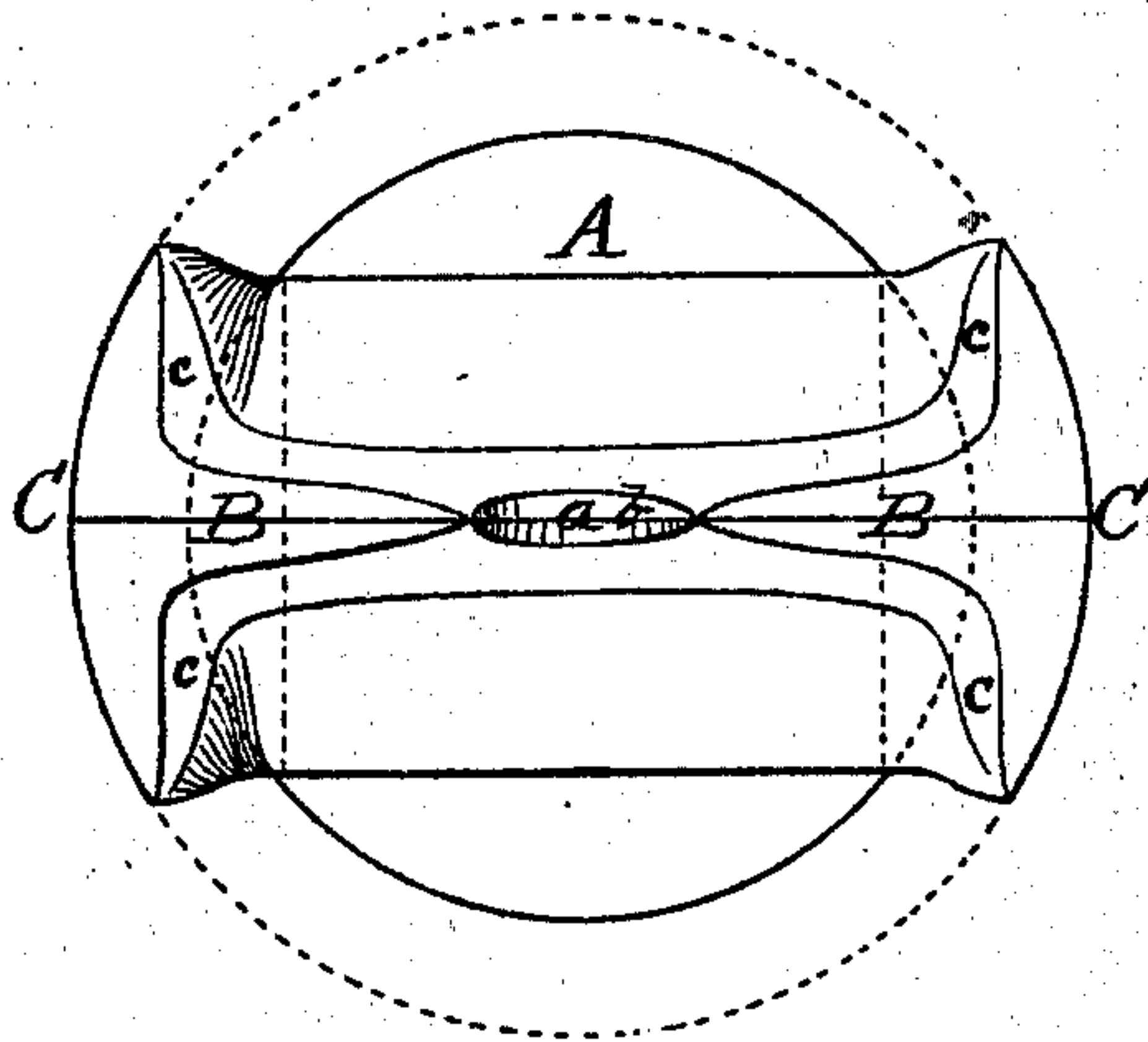


Fig. 3.

WITNESSES.

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UNITED STATES PATENT OFFICE.

GEORGE KOCH, OF CASS, PENNSYLVANIA.

IMPROVEMENT IN WELL-DRILLS.

Specification forming part of Letters Patent No. **144,550**, dated November 11, 1873; application filed March 1, 1873.

To all whom it may concern:

Be it known that I, GEORGE KOCH, of Cass, in the county of Venango and State of Pennsylvania, have invented a new and valuable Improvement in Well-Drills; and 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, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a perspective view of my drill. Fig. 2 is a face view of the same. Fig. 3 is a bottom view of the same.

This invention has relation to drills for deep wells; and it consists in the construction and novel formation of the cutting portion or lower end of the drill, whereby it is readily and conveniently sharpened or dressed. This improved construction also serves to give the drill a free dropping motion in the well.

As ordinarily constructed, the corners of a drill wear off, leaving the drill rounded up on its edge, in which condition it will not work effectively. It becomes necessary then to make the cutting-edge square and straight again, and this is usually accomplished by forging back the center and flattening the same, drawing the corners forward until they are square with the edge. Much labor is expended in dressing old or worn drills in this manner, which it is the object of this invention to save, it being designed in my improvement to mass the metal on the corners and side edges, and to make the middle portions of the sides correspondingly concave.

In the accompanying drawings, the letter A designates the body of the drill, and B its cutting-edge, having a notch, *a*, at its middle portion, which may be also provided with a cutting-edge, *b*. C C designate the side edges of the drill, made convex from side to side. Between the side edges C, the body of the drill for some distance above the cutting-edge is made concave or fluted on each side, the concavity being somewhat rectangular, with rounded angles or corners, and extending down to the bevel of the cutting-edge, as shown at *z'* on the drawings. The inner walls *c* of the side edges C are designed to be paral-

lel. This concavity or fluting *z'* gradually becomes more shallow as it approaches the middle of the body, until it disappears, becoming flush with the squared shank portion D.

Such a drill is designed to operate effectively for a great length of time without resharpening. The convexity and massing of the metal at the corners enables these corner-cutting edges to be made square and strong; and, in use, the more delicate middle portion of the cutting-edge will be worn away with sufficient rapidity to keep pace with the corners, thus preserving somewhat the form of the cutting portion while it is being worn away.

But its most important advantage is the convenience and economy of the sharpening or dressing process. The corners can be readily drawn forward to make the edge square, without forging the center back, saving much labor. In sharpening, the drill is not rendered thinner by forging, and the corners can be drawn forward to make a strong edge, preserving at the same time the texture of the steel, and causing it to stand the wear of the hard rock. The notch is designed to diminish the drilling-surface. It leaves a small core standing in the center of the well, which breaks away, offering but little resistance to the drill. It also adds to the convenience of dressing the drill. A wedge can be placed in the notch to spread the drill to the desired gage.

On account of the fluted sides, rendering the drill thin at this portion, it will drop freely in working, being unobstructed to any extent by the water and debris in the well.

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

1. The rock-drill having the faces *z* gradually fluted from the cutting-edge upward, the concavity gradually becoming more shallow, and merging into the shank portion, as described.

2. The rock-drill having fluted sides *z'* convex sides C, and centrally-notched cutting-edge, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

GEORGE KOCH.

Witnesses:

J. W. SMULLIN,
J. H. KOCH.