

R. TUCKER.

Drills for Mining Coal, &c.

No. 148,528.

Patented March 10, 1874.

Fig. 1.

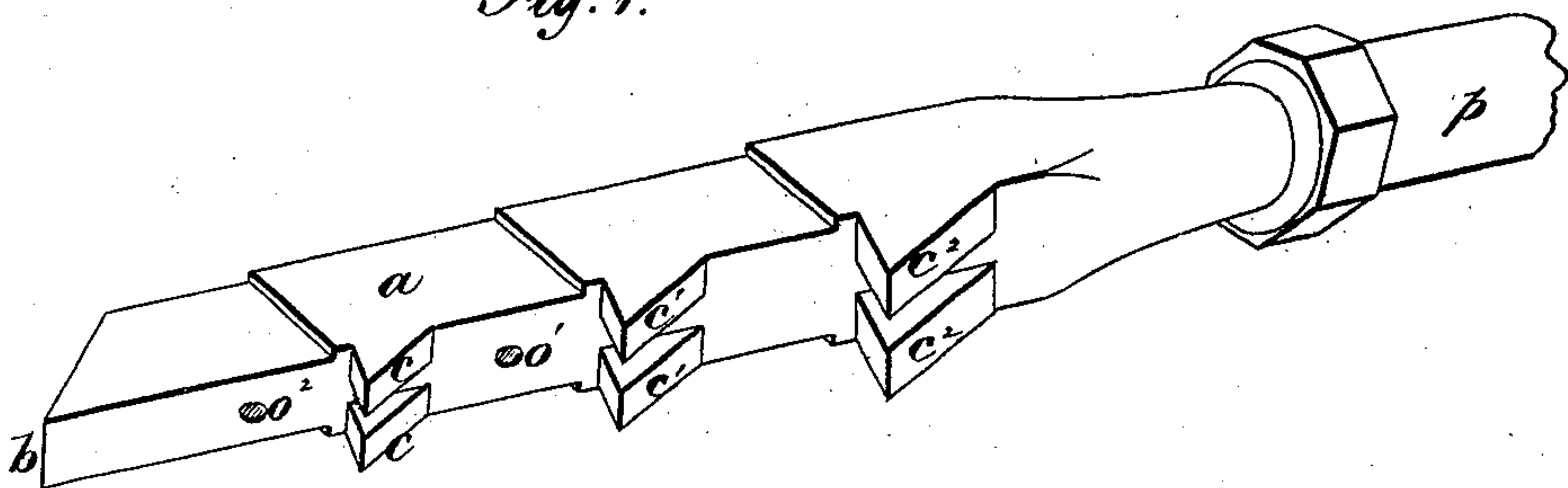


Fig. 2.

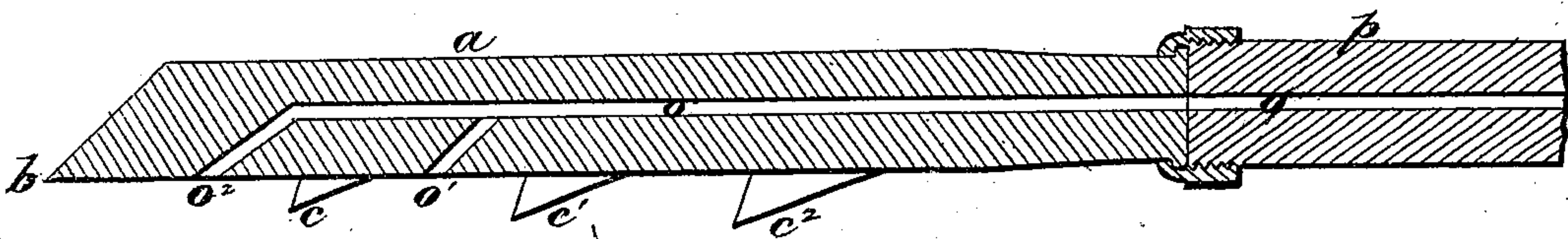
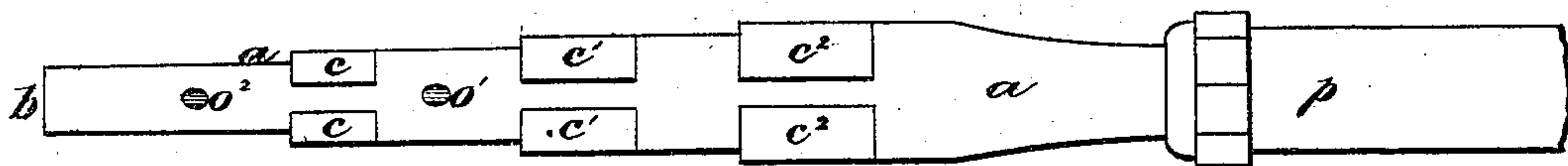


Fig. 3.



Witnesses.

C. F. Brown.  
Joseph Whitaker.

Inventor  
Robert Tucker.  
by his Attys.

Hee & Ellsworth.

# UNITED STATES PATENT OFFICE.

ROBERT TUCKER, OF FRANKFORT SPRINGS, PENNSYLVANIA.

## IMPROVEMENT IN DRILLS FOR MINING COAL, &c.

Specification forming part of Letters Patent No. **148,528**, dated March 10, 1874; application filed February 7, 1874.

*To all whom it may concern:*

Be it known that I, ROBERT TUCKER, of Frankfort Springs, in the county of Beaver and State of Pennsylvania, have invented certain new and useful Improvements in Drills for Mining Coal, Chalk, and other substances; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings forming part of this specification, in which—

Figure 1 is a perspective view of my improved drill. Fig. 2 is a longitudinal section, and Fig. 3 is a bottom view of the same.

Similar letters of reference in the accompanying drawings denote the same parts.

My invention relates to improvements in drills for mining coal or other similar substances; and it consists of a drill provided with a beveled or chisel point, and having fixed saw-teeth arranged on its lower face, each saw-tooth being longer and wider than the one preceding it, and the drill being provided with central and side channels for the passage of compressed air, for the removal of cuttings and dust.

In the accompanying drawings, *a* is the drill provided with a beveled or chisel-shaped edge, *b*. *c c c<sup>1</sup> c<sup>1</sup> c<sup>2</sup> c<sup>2</sup>* are fixed saw-teeth situated on the lower face of the drill, and preferably made in sets, as shown, there being two or more teeth in each set, though I do not mean to confine myself to arranging the teeth in sets, as shown in the drawing, as single saw-teeth may be arranged on the lower face of the chisel-pointed drill without departing from the spirit of my invention. The saw-teeth *c c c<sup>1</sup> c<sup>1</sup> c<sup>2</sup> c<sup>2</sup>* are of different lengths, the teeth *c<sup>1</sup> c<sup>1</sup>* being longer than the teeth *c c*, or, in other words, each set of teeth is made longer than the set preceding it, and each set of teeth is made wider than the one which precedes it. By this construction and arrangement of the saw-teeth the drill being introduced into the mine in a face or hole suitably drilled to the depth of the longest saw-tooth or that farthest from the chisel-point of the drill, and suitable motive-power being applied to the drill to give it a reciprocating movement, the longer set of saw-

teeth *c<sup>2</sup> c<sup>2</sup>* cut a kerf in the forward movement of the drill wider and deeper than that cut by the saw-teeth *c<sup>1</sup> c<sup>1</sup>*, and in like manner the teeth *c<sup>1</sup> c<sup>1</sup>* cut a kerf wider and deeper than the teeth *c c*, thus cutting the coal in the form of steps, the stroke of the drill being somewhat longer than the distance between two adjacent sets of teeth. The drill may obviously be applied horizontally or vertically or at any desired angle. *o* (see Fig. 2) is a channel extending centrally and longitudinally from the forward end of the drill to a short distance from its beveled or chiseled point; and *o<sup>1</sup> o<sup>2</sup>* are channels connecting the inner central channel *o* with the lower face of the drill, any number of said side channels being employed as desired. *p* is a piston-rod screwed or otherwise attached to the forward end of the drill, and having a central channel, *o<sup>3</sup>*, which, when the piston-rod is attached to the end of the drill, is a continuation of the central channel *o* of the drill. In lieu, however, of a hollow piston-rod, hose or its equivalent may be employed, the object of the invention being to force air compressed into the central channel *o*, and thence through the side channels *o<sup>1</sup> o<sup>2</sup>* into the kerfs cut by the saw-teeth, thereby clearing the drill-opening of dust. It will be seen by my construction that the outer step or kerf cut by the set of teeth *c<sup>2</sup> c<sup>2</sup>* is wider and deeper than the kerfs or steps cut by the teeth which precede it, thereby facilitating the passage of the dust driven from the drill-opening by the compressed air.

I am aware that hollow drills provided with perforations for the passage of water to remove the cuttings and dust arising from drilling have heretofore been employed, and I therefore lay no claim to such invention. The employment of water to remove the cuttings and dust is objectionable for several reasons, among which may be enumerated the following: The introduction of water into the mine is objectionable, because it has afterward to be pumped out. In coal-mining, also, the employment of water is objectionable, because a sticky adhesive substance is formed by the admixture of water or steam with the coal-dust which ad-



heres to the drill-openings, while by the use of compressed air these objections are entirely obviated.

Having thus described my invention, what I claim as new is—

The drill *a*, provided with a chisel-point, *b*, and having fixed saw-teeth *c* *c*<sup>1</sup> *c*<sup>2</sup> on its lower face, each successive tooth being longer and wider than the one which precedes it, and the

drill being provided with a central channel, *o*, and side channels *o*<sup>1</sup> *o*<sup>2</sup> for the passage of compressed air for the removal of cuttings and dust, substantially as described, and for the purposes set forth.

ROBERT TUCKER.

Witnesses:

N. K. ELLSWORTH,  
MELVILLE CHURCH.