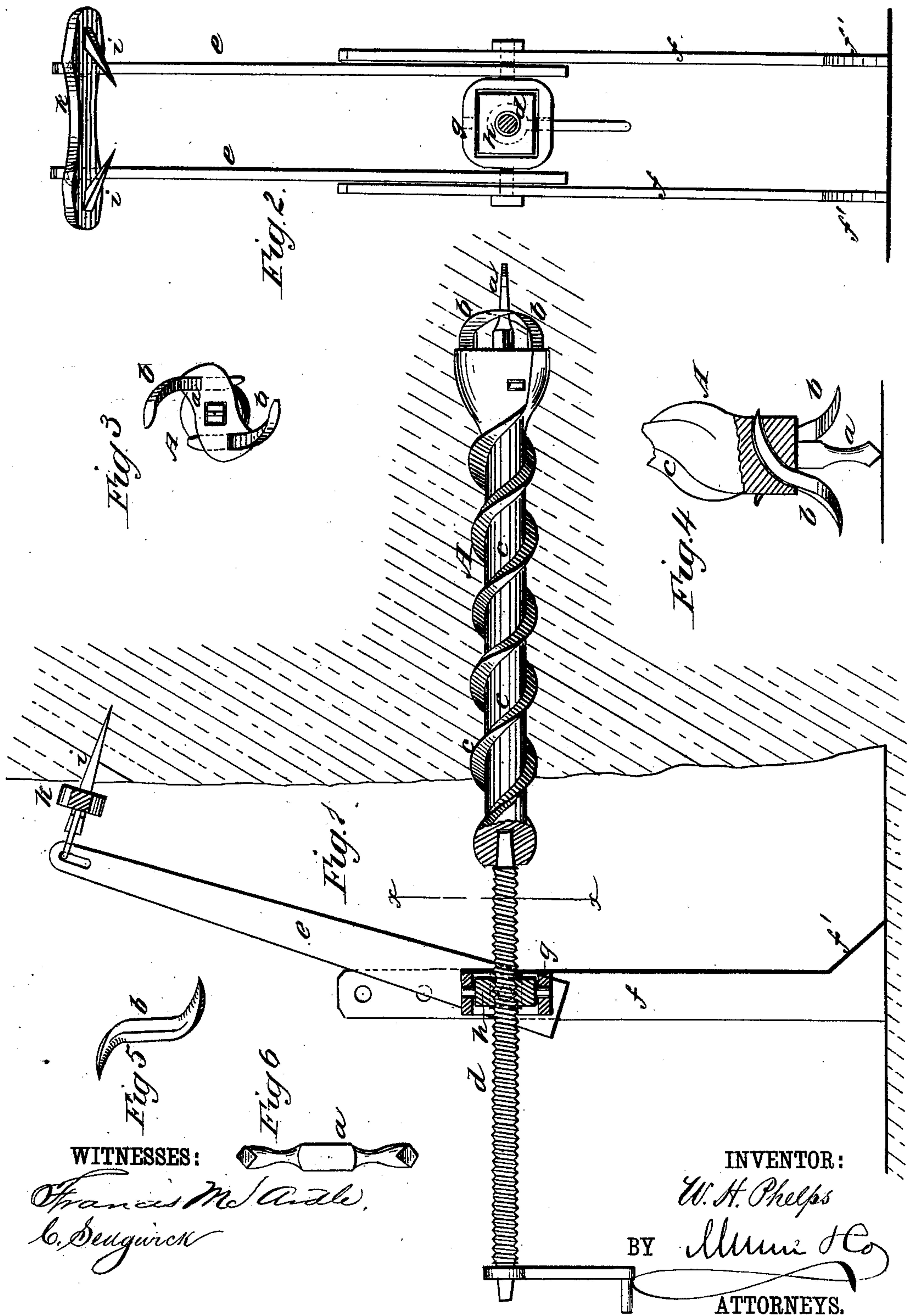


(No Model.)

W. H. PHELPS.  
Drill for Coal, &c.

No. 235,288.

Patented Dec. 7, 1880.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

WALLACE H. PHELPS, OF ALLIANCE, OHIO.

## DRILL FOR COAL, &c.

SPECIFICATION forming part of Letters Patent No. 235,288, dated December 7, 1880.

Application filed May 14, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, WALLACE H. PHELPS, of Alliance, in the county of Stark and State of Ohio, have invented a new and useful Improvement in Drills for Coal, Rock, &c., of which the following is a specification.

My improvements relate to drills for coal, ore, and rock mining.

The object of my invention is to construct a drill of durable form that will act more efficiently and may be operated more conveniently than any heretofore used; and my invention consists in certain novel details of construction of the auger, cutting-points, and truss for holding the operating-screw and nut, which will be explained hereinafter in detail with reference to the accompanying drawings, forming part of this specification.

In the drawings, Figure 1 is a sectional side elevation of my improved drilling apparatus as applied to use. Fig. 2 is a face view of the same, the operating-screw being cut off, on the line *x x*. Fig. 3 is an end view, and Fig. 4 a sectional side view, of the auger. Fig. 5 shows one of the cutting-knives detached, and Fig. 6 shows the drill-point detached.

Similar letters of reference indicate corresponding parts.

A is the auger, fitted at its end with the drill-point *a* and knives *b*, and formed on its core or stem portion with two ribs, *c*, of spiral form, extending its whole length. Only a single section of the auger is shown, but it will be understood that there are to be a number of sections, each formed with spiral ribs and fitted for being secured together as the work progresses. The double spiral ribs serve to strengthen and stiffen the stem of the auger much more than the single rib heretofore used.

The drill-point *a* is formed double-ended, and is inserted in a mortise in the end of the auger, so that it may be taken out and reversed.

The knives *b*, of which there are two, are made with cutting-edges at each end, so as to be reversible. These knives are bent in S form, and are held by being inserted in tapering apertures, so that the pressure of drilling will bind them firmly in the auger, and they may also be removed for reversal or sharpening. The shape of these knives renders them effective for cutting rapidly and insures durability.

For sustaining the operating-screw *d* of the auger I make use of a simple and efficient truss composed of two upper bars, *e e*, and lower bars, *ff*, jointed together by a yoke, *g*, in which is pivoted the solid nut *h* for the screw *d*. The yoke *g* is hung by its trunnions in the bars *ef*, so that the screw may swing in two directions to permit operation at an angle and prevent binding of the auger. This construction also permits adjustment of the truss at the angle required.

At the upper ends of bars *e* is hung a cross-bar, *k*, that is formed at its end with inclined apertures for receiving spikes *i* that are to be driven into the heading to hold the truss.

The lower bars, *f*, are slotted or perforated with a number of holes to allow their adjustment in length on the yoke *g*, and are formed at their outer ends with beveled foot-pieces *f'*, whereby they may be secured to the heading by staples or otherwise. This construction furnishes a simple and strong truss adapted for use in any situation, as required.

The screw *d* is formed with its ends squared to enter the mortise of the auger-section by either end and for receiving a crank-handle at the other end.

In operation, when the first section of the auger has been forced into the length of the screw the screw is to be detached from the auger and the nut turned over to change the screw-rod end for end, the handle then changed, and a second section of the auger put in place. This is to be repeated until the hole is of the desired depth.

The auger in the form shown is adapted for coal, ore, or rock drilling.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The S-shaped cutting-knives *b*, formed with cutting-edges at both ends, combined with the auger having a tapering aperture, substantially as and for the purposes set forth.

2. In drilling-apparatus, the pivoted yoke *g*, solid nut *h*, pivoted in yoke *g*, and the screw *d*, combined together and with the sustaining-truss, substantially as described and shown, for operation as set forth.

WALLACE H. PHELPS.

Witnesses:

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