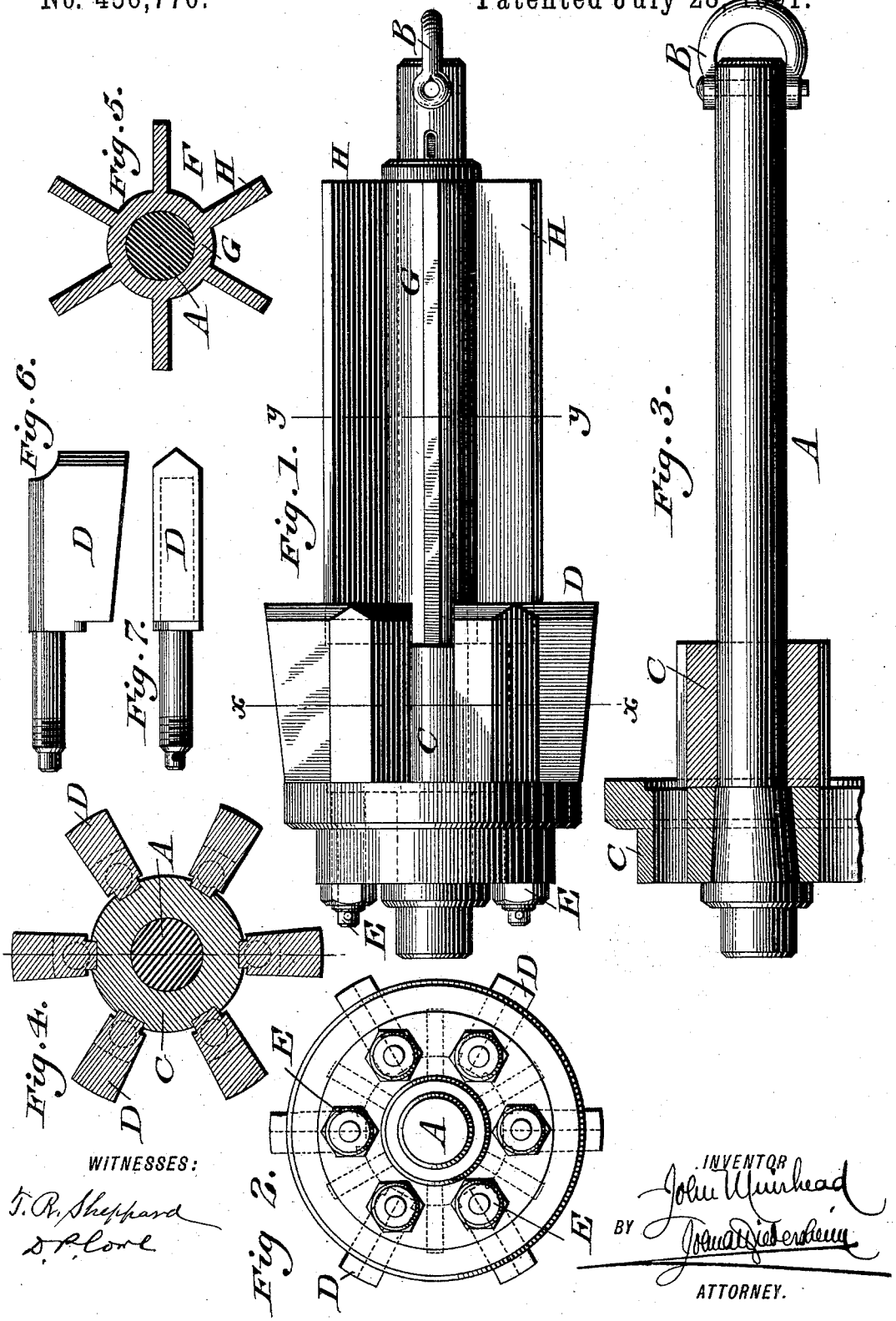
(No Model.)

J. MUIRHEAD.

DRILL.

No. 456,770. Patented July 28, 1891.



WITNESSES:

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DRILL.

SPECIFICATION forming part of Letters Patent No. 456,770, dated July 28, 1891.

Application filed December 16, 1890. Serial No. 374,911. (No model.)

To all whom it may concern:

Be it known that I, JOHN MUIRHEAD, a citizen of the United States, residing at Pittston, in the county of Luzerne, State of Pennsylvania, have invented a new and useful Improvement in Drills, which improvement is fully set forth in the following specification and accompanying drawings.

My invention has for its object a device adapted to readily enlarge an opening leading from a drift or gallery of a mine to an upper passage or the surface of the ground, so that its diameter when so enlarged is uniform and the walls smooth or straight from end to end; and for this purpose it consists of the novel drill hereinafter described.

It further consists of the combination of parts hereinafter set forth.

Figure 1 represents a side view of a drill embodying my invention. Fig. 2 represents an end view of the same. Fig. 3 represents a side view of the shaft with bit-holder thereon. Fig. 4 represents a section on line *x x*, Fig. 1. Fig. 5 represents a section on line *y y*, Fig. 1. Figs. 6 and 7 represent views at right angles to each other of a bit employed in the invention.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a shaft having attached to one end thereof a clevis B for fastening an operating-rope thereto. On a tapering portion of the said shaft is firmly secured a bit-holder C, having an enlarged portion or head, in which is inserted the shanks of the bits D, the same being held in place by the nuts E.

F designates a guide, consisting of a sleeve or a tubular portion G, adapted to encircle the shaft on which it is loosely mounted, and the radial arms H, which extend lengthwise of the sleeve G and have their lower ends between the upper portions of the bits.

The manner of using the device is as follows: The drill herein described, which is particularly adapted to enlarge an opening leading from a drift or gallery to either an upper chamber of a mine or to the surface of the ground, is secured to a rope or cable which is passed through said opening and operated from the said upper chamber or surface. The shaft of the drill having thereon a guide of the exact diameter of the opening is inserted therein and the drill raised, so that the cutting-edges of the bits, which extend beyond the ends of the arms H of the guide, bear against the portion of the top wall of the drift surrounding the opening. The rope is then twisted or rotated at its upper end, whereby a rotary motion is imparted to the drill and bits thereon, so that the said bits remove or cut away a circular channel in the said top wall surrounding the opening, the débris or cutting falling between the bits and escaping between the head of the holder and wall.

It will be seen that the guides insure a uniform movement to the drill, so that the enlarged opening will be of uniform diameter and its walls straight from end to end.

The drill, as described, is of few parts, strong and compact, and can be readily operated.

The shaft is shown in the drawings with a shoulder or enlarged portion, which assists in supporting the holder thereon, said shoulder being at the enlarged end of the tapered portion of the shaft.

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

1. A drill for the purpose named, consisting of a shaft, a bit-holder on said shaft and rotatable therewith, a guide consisting of a sleeve with radial arms, the latter extending toward said holder so as to be adapted to intervene between the bits in said holder, said bits having their cutting-edges extending beyond the outer edges of the arms of the guide and the body of the bit-holder, said parts being combined substantially as described.

2. A drill consisting of a shaft, a bit-holder thereon and rotatable therewith, a guide consisting of a sleeve loosely mounted on said shaft and provided with radial arms extending lengthwise thereof, one end of each of said arms being between the cutting ends of the bits inserted in said holder, and means secured to the end of said shaft for supporting and rotating the same, said parts being combined substantially as described.

3. A drill for the purpose described, consisting of a shaft with a bit-holder secured thereon, so as to be rotatable therewith, a guide consisting of a sleeve encircling said

shaft and having radial arms extending lengthwise thereon, one end of each of said arms being between the cutting ends of bits inserted in said holder, and a clevis secured to one end of the shaft, said parts being combined substantially as described.

4. A drill for the purpose described, consisting of a shaft having attached to one end thereof means for securing a rope thereto and having a tapering portion, a holder with enlarged head adapted to receive the shanks of cutting-bits, arms connected with said shaft, each having one of its ends between said cutting-bits, said parts being combined substantially as described.

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Witnesses:
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