A. G. Coles,

Rock Drill.

No. 51,925. Patented Jan. 9, 1866.

Fig. 1.

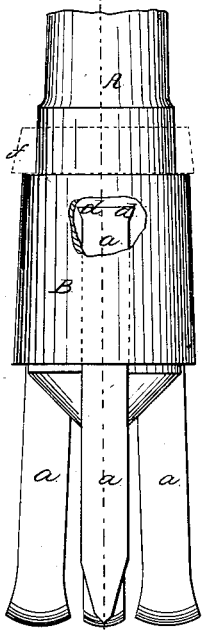


Fig. 2.

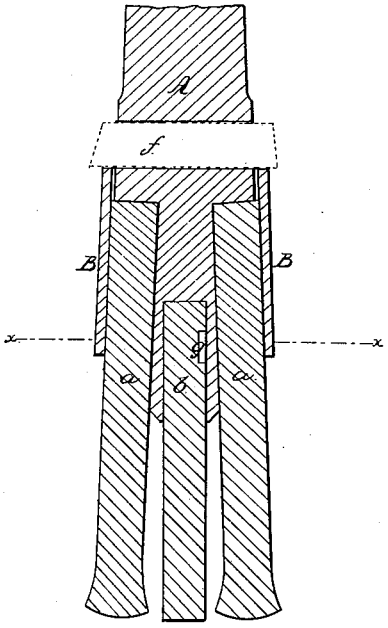


Fig. 3.

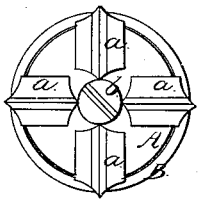
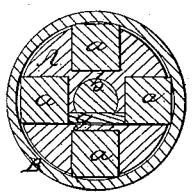


Fig. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

ADAM G. COLES, OF MAMARONECK, NEW YORK.

IMPROVEMENT IN WELL-DRILLS.

Specification forming part of Letters Patent No. **51,925**, dated January 9, 1866; antedated January 3, 1866.

To all whom it may concern:

Be it known that I, ADAM G. COLES, of Mamaroneck, in the county of Westchester and State of New York, have invented a new and useful Improvement in Drilling-Tools for Boring Oil or other Artesian Wells, and for other Drilling in the Earth's Crust; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of the tool and a portion of the rod to which it is attached. Fig. 2 is a central vertical section of the same; Fig. 3, an inverted plan of the same. Fig. 4 is a transverse section of the same in the plane indicated by the line *x x* in Fig. 2.

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

This invention consists in a novel arrangement of reversible movable cutters fitted to a stock, whereby great facility is afforded for the regrinding or repair of the cutters, and the liability of breaking the drill or tool is greatly reduced.

It further consists in a novel mode of securing or fastening the movable cutters in the stock, whereby they are held very firmly when secured, and facility is afforded for their removal whenever required.

In order to instruct others skilled in the art to construct and apply my invention, I will proceed to describe it, with reference to the drawings.

A represents the lower portion of the drill-rod, which is enlarged at its lower extremity for a short distance in the shape of the frustum of a cone, to form a stock for the reception of the chisel-pointed cutters *a a a a b*. In the drawings there are five cutters represented, viz., a central one, *b*, which is inserted into a socket bored into the center of the stock, and is secured by a transverse key, *c*, and four radial cutters, *a a a a*, which are inserted into longitudinal grooves cut in the exterior of the stock. I do not limit the number of radial cutters. The upper parts of the radial cutters are square, but have a head upon them of a dovetail form, as shown at *d d* in Fig. 1, where a portion of the securing-collar B is represented as broken out to expose one of the dovetail-formed heads. The grooves provided in the stock are of a corresponding form with the cutters, so that they can be inserted sidewise, with either corner of the cutting-edge outward.

The collar B is made of a conical form, of the same taper upon its interior surface as the outer surface of the stock, and is placed over the stock by passing it over the drill-rod from its upper end, and, when pushed tightly over the stock and upper portion of the radial cutters, secures the same against any lateral displacement, their longitudinal displacement in either direction being prevented by the dovetail form of the heads. When the collar is driven sufficiently down upon the stock and cutters it is prevented from again rising or becoming loose (until required) by means of a key, *f*, inserted transversely through the stock, above the heads of the cutter. The lower part of this key rests against the upper edge of the collar B and holds it securely in its place.

The lower part of the stock is beveled toward the center downward, which allows the tool to clear itself from the detritus in drilling. The radial arrangement of these cutters and their edges (shown in Figs. 3 and 4) precludes any possibility of the tool following or driving into a crevice in the rock or stone, thereby being broken or boring an untrue and irregular hole, as so often occurs when the drill of the ordinary chisel-pointed construction is used.

If any of the cutters become broken or require regrinding, they may be removed (after the tool is withdrawn from the hole) by first drawing out the key *f*, and then driving up the collar B until it clears the top of the cutters *a*.

The outer corners of a boring-tool always wear off the quickest, and in order to renew them I simply turn the cutters in an opposite position when the collar B is moved upward clear of the cutters, thus presenting new cutting-corners upon the outside, and producing a hole of uniform diameter. To remove the central cutter the same operation is necessary, with an addition of driving out the key *g*, which is inserted transversely through the stock, and extends from one of the grooves which receives the radial cutters to a similar groove directly opposite, and passes either

through a hole in the cutter or through a transverse slot or key-seat cut in its exterior.

The key *g* need not necessarily be inserted as hereinbefore described, but may be inserted clear through the stock.

The central cutter, *b*, will cut a hole of a diameter slightly larger than or of the same size as the space left uncut by the radial cutters *a*.

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

1. The construction of a drill for drilling or boring oil or other artesian wells, or other drilling operations in the earth's crust, with a central cutter and a surrounding series of reversible movable radial cutters, substantially as herein specified.

2. The combination of the dovetail-headed cutters *a d a d*, the longitudinal grooves in the stock, the surrounding collar B, and the key *f*, substantially as and for the purpose herein set forth.

A. G. COLES.

Witnesses:
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