A. NICOL.

Hand-Drill for Stone-Working, Mining, &c.

No. 210,430. Patented Dec. 3, 1878.

Fig. 1.

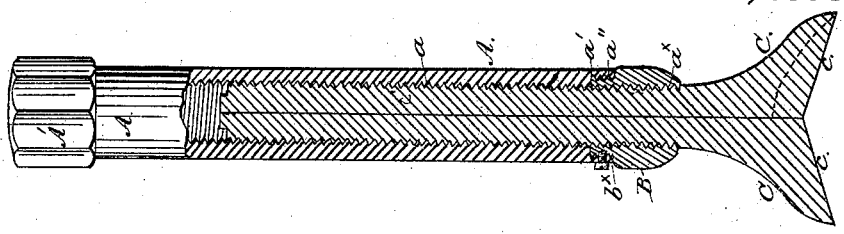



Fig. 2.

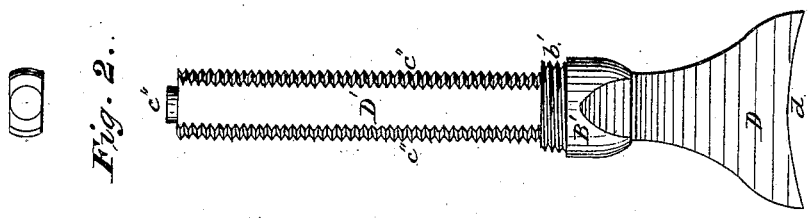



Fig. 4.

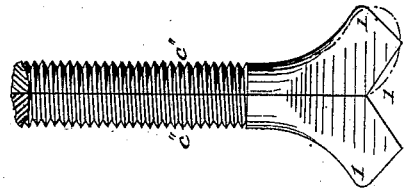



Fig. 3.


Fig. 5.

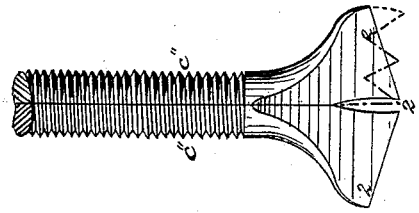



Fig. 6.

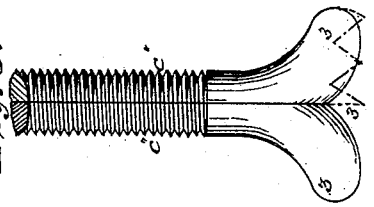



Fig. 7.

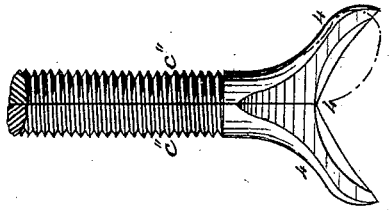



Fig. 8.

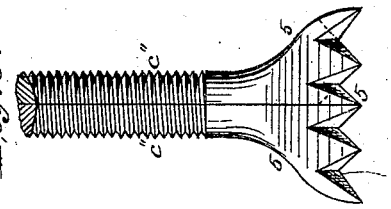
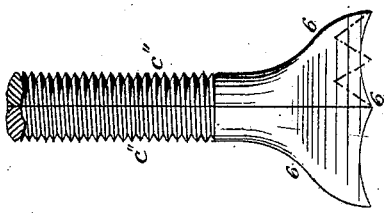



Fig. 9.




Witnesses:

J. C. Brecht

J. S. Holmes.

Inventor:

Andrew Nicol

By A. Cranford

Attorney.

# UNITED STATES PATENT OFFICE.

ANDREW NICOL, OF SCRANTON, PENNSYLVANIA.

## IMPROVEMENT IN HAND-DRILLS FOR STONE-WORKING, MINING, &c.

Specification forming part of Letters Patent No. **210,430**, dated December 3, 1878; application filed November 8, 1878.

*To all whom it may concern:*

Be it known that I, ANDREW NICOL, of Scranton, in the county of Lackawanna, in the State of Pennsylvania, have made certain Improvements in Hand-Drills for Coal-Miners, of which the following is the specification:

The object of this invention is to improve the hand-drill or hand-boring instrument in mining coal as now used by miners; and it consists in the construction of the drill and its parts, as will be fully hereinafter described.

In the drawing, Figure 1 represents a part side and a part sectional view; Fig. 2, a side view of one of the bits used in the drill-stock. Fig. 3 is a side view of a cap or thimble; and Figs. 4, 5, 6, 7, 8, and 9 represent, in pairs, the different tools—such as picks, reamers, and bits—used in the drill-stock.

A represents a tubular steel stock or socket, with a screw-thread, *a*, cut in its interior diameter, which may be one foot or more in length, as desired, and at *a'* is an enlarged part of the inner diameter of the stock, in which is cut a screw-thread, *a''*. A' is the hand or outer end of the drill, and may be attached to the tube A by screw-thread, or it may be welded thereto, as is most convenient, or attached in any other secure manner, and of any desirable form and length to suit the work or the user.

B is a screw cap or thimble, having an interior screw-thread, $a^{\times}$, cut in it to coincide with the inside diameter of the tubular stock A, and on the outer diameter, and at its outer end, is cut a rabbet, *b*, with an external screw-thread, *b'*, cut thereon, so that stock A can be screwed onto screw-thread *b'*, and when so screwed to the cap the internal screw-thread *a* of stock A will be continued through cap B and be coincident therewith, as seen in Fig. 1.

B' in Figs. 2 and 3 is a screw cap or thimble, similar in construction to cap B, excepting that it has no interior screw-thread in its longitudinal and oblong opening or slot that allows it to freely slide over the screw-thread on the tang of the chisel or cutter on which it is used, and when this cap is used with the stock A it connects with the stock the same as cap B.

C C represent a pair of bits longitudinally separated, having cutting-edges *c* at their outer ends, and tangs *c'*, with screw-threads *c''*, cut thereon, so that they can be easily and firmly screwed through the cap or thimble B and into the socket A, and be held firmly therein, and when so fixed the drill is ready for use.

Fig. 2 represents a single bit or chisel, D, having its cutting-edge *d* concave, and its tang D' flattened on opposite sides, and the screw-thread *c''* cut on the edges, so that it can be screwed into the socket A, the thimble B' sliding freely on the tang, and when the socket is screwed onto the tang of the cutter and into the screw-thread on the thimble the cutter D will be fast in the socket, and when the bits C or cutter D are screwed home in the socket A a holding-screw, *x*, is turned through the rabbeted part of the socket A into the thimble B or B', and the drill, cutter, reamer, or bit so held will be ready for use.

Figs. 4, 5, 6, 7, 8, and 9 represent different forms of tools to be used in socket A, and are shown to be in pairs, as 1, 2, 3, 4, 5, and 6; and as these different forms represent different cutting, boring, reaming, or picking edges or points, and are, like the bits C, divided longitudinally, having screw-threads *c''* on all of them, it is evident that they can be used together, or they can be interchanged with each other, and have one half of the tool of one kind of cutter and the other half of a different kind—as, for instance, the half of pick 5, Fig. 8, could be used with the half of 6, Fig. 9, or with the half of C, Fig. 1, or any number of transpositions can be made by the interchange of the divided cutting-tools, as desired, and as in part may be seen by the dotted lines in Figs. 1, 4, 5, 7, and 9, and as circumstances and conditions of the coal may require.

These hand-drills, as generally used by miners, are heavy bars of steel, with the cutting-edges made upon the end of the bar, or the cutting-edges of steel are welded upon bars of iron. In either case they are quite heavy, and as the cutting-edge, whether it be in the form of a pick, drill, cutter, or reamer, by use becomes dull, and has to be taken to the smith's forge to be sharpened frequently, it becomes burdensome to the miner to take with him when he goes out of the mine at night the several heavy drills for that purpose,

while the hand-drill, as herein described, can have any number of bits, cutters, picks, or reamers, when constructed as above described, that can be quickly removed from their sockets, which enables the miner to have a greater variety of tools, and by having them removable and interchangeable he will have only the bits or drills to take out of the mine to be sharpened, thus saving time and heavy carriage to the miner.

Further, the drill as a whole is simple and easily taken apart, so that other cutters, having different cutting points or edges, may be inserted, is strong and durable, and not liable to be out of repair until entirely worn out or broken.

By duplicating the removable bits, drills, picks, reamers, or cutters that can be used in the drill-stock A, as above described, much time is saved the miner if the point or edge of a cutting-tool is broken, which is a frequent occurrence, as it is but the work of a moment to remove the broken tool and insert a perfect one, when, if the tool so broken was a part of the stock and not removable therefrom, the whole drill would have to go to the smith to be repaired.

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

1. In a hand-drill for coal-mining, the cylindrical socket A, having the internal screw thread *a* therein, in combination with removable tools in pairs, such as C C, having screw-threads *c''* on their tangs, to be screwed into socket A, constructed to operate as described.

2. The cylindrical socket A of a miner's hand-drill, having the internal screw-thread *a* therein, and the screw cap or thimble B, in combination with the removable drill or cutters C C, having screw-threaded tangs or any of the interchangeable bits, drills, cutters, or picks shown, substantially as and for the purposes described.

3. The cylindrical socket A of a miner's hand-drill, having the internal screw-thread *a* therein, and the screw cap or thimble B′, in combination with the bit or chisel D, having a flattened and screw-threaded tang, D′, constructed to operate substantially as described.

4. A miner's hand-drill, such as above described, composed of the cylindrical socket A, having the internal screw-thread *a* therein, screw cap or thimble B or B′, and removable and interchangeable bits, cutters, picks, or drills, either whole or in two parts, as shown, or transposed, as seen in the dotted lines, as and for the purposes described.

ANDREW NICOL.

Witnesses:

JAS. H. TORREY,

S. P. MCDIVITT.