

D. MINTHORN.

Dies for Forming Rock-Drills and other Tools.

No. 145,519.

Patented Dec. 16, 1873.

Fig. 1.

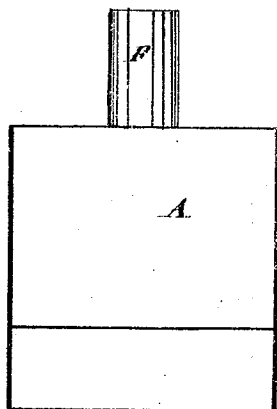


Fig. 2.

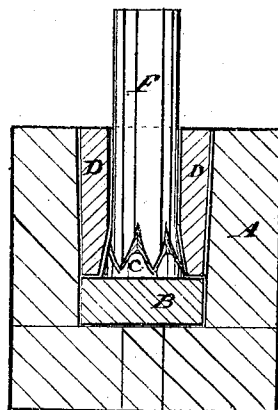


Fig. 3.

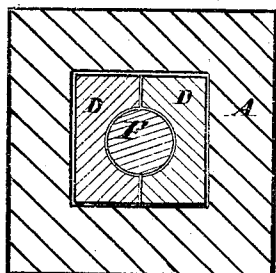


Fig. 4.

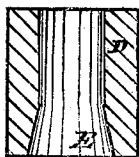


Fig. 6.



Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

DANIEL MINTHORN, OF GOUVERNEUR, NEW YORK, ASSIGNOR OF THREE-FOURTHS HIS RIGHT TO D. P. SMOCK, OF NEW YORK CITY.

IMPROVEMENT IN DIES FOR FORMING ROCK-DRILLS AND OTHER TOOLS.

Specification forming part of Letters Patent No. **145,519**, dated December 16, 1873; application filed March 20, 1873.

To all whom it may concern:

Be it known that I, DANIEL MINTHORN, of Gouverneur, St. Lawrence county, State of New York, have invented certain new and useful Improvements in Making or Forming Dies, Drills, Chisels, and other tools for cutting stone and mining purposes generally; and I do hereby declare the following to be a full description of the same, reference being had to the accompanying drawings forming a part of this specification, the same letters of reference, wherever they occur, referring to like parts.

Figure 1 is a side view of the die-stock. Fig. 2 is a sectional view of the same, showing the drill and die-plate in profile. Fig. 3 is a plan or top view of the die-stock and clamping-blocks. Fig. 4 is a detached view of one of the clamping-blocks. Fig. 5 is a side view of the drill. Fig. 6 is a plan view of the die-plate.

The nature of my invention consists in combining, with the die-stock, adjustable clamping-blocks and die-plates, whereby drills, chisels, and other tools for drilling and cutting stone, may be formed by striking the same up while in the semi-fused state, and freed from the die-stock with facility and dispatch when thus formed.

These dies are composed of a suitable stock, A, made of cast-iron, or wrought-iron, or chrome or tungsten steel, as may be desired. In the center part of the stock is formed a square mortise of some four, or more or less, inches deep, according to the drill to be made, the upper edges of which are slightly greater in diameter than the bottom of the mortise. The object of this is to give easy admission of the die-plate B to its seat in the bottom of the mortise, and its withdrawal therefrom to relieve the drill from the die.

The die or former C may be made with any number of cutting-edges desired.

It is designed to have a different die-plate for each drill used for a different kind of work, so that drills of any size and form of cutting-face may be struck up by the simple change of the die.

For the purpose of supporting the bar of metal in a solid and vertical position when being swaged up to form the cutting-face thereon, two adjustable clamping-blocks, D, are made to fill the mortise in the die-stock, except a vertical central opening for the admission of the bar of metal to be formed into the drill F. The lower end of this central opening, as shown at E, Fig. 4, is made flaring, so as to fit around the edges of the die C and down upon the base or die-plate B. The object of thus making the end flaring is to admit of the expansion of the metal when being formed in the die, and at the same time enlarge its diameter, so as to free itself when perforating the stone.

In making the drills I use chrome steel, or tungsten steel. By experiments I find that chrome steel, or tungsten steel, when heated to a white heat, is not impaired in quality, and at the same time, being in a semi-fused state, is capable of receiving a finished cutting-edge by compression in a suitable die. With carbon steel, or steel ordinarily used for making drills and chisels for drilling and cutting stone, a white heat "burns up the metal," as it is technically termed—that is, destroys its value or capacity for being usefully employed to make drills—while an ordinary tempering heat is not sufficient to produce that semi-fused condition necessary to obtain a sharp cutting-edge by means of dies.

My method or process of making the drill or other tool is to take a suitable bar of chrome steel, or tungsten steel, and heat one end of it to a white heat, and, as rapidly as possible, insert the heated end into the opening through the clamping-blocks, and down upon the die, and, by a single blow or blows of a hammer upon the upper end of the bar, strike up the impression of the die on the heated end of the bar to form the drill or chisel. When thus formed, the die-plate and clamping-blocks, with the drill therein, are forced from the mortise by a rod through the opening H in the die-stock. The two halves of the clamping-blocks are then separated from the drill, which, when tempered by the usual process

of hardening the cutting-edges of drills and other tools for cutting stone, is completed and ready for use.

Having now described my invention, I will proceed to set forth what I claim and desire to secure by Letters Patent of the United States.

I claim—

The combination of the die-stock A with

the adjustable clamping-blocks D and die-plate B, for the purposes described, and made and operating substantially as hereinbefore set forth.

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Witnesses:

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