H. B. WILLIAMS & J. C. WILSON.

ROCK DRILL.

No. 51,376. Patented Dec. 5, 1865.

Fig. 1.

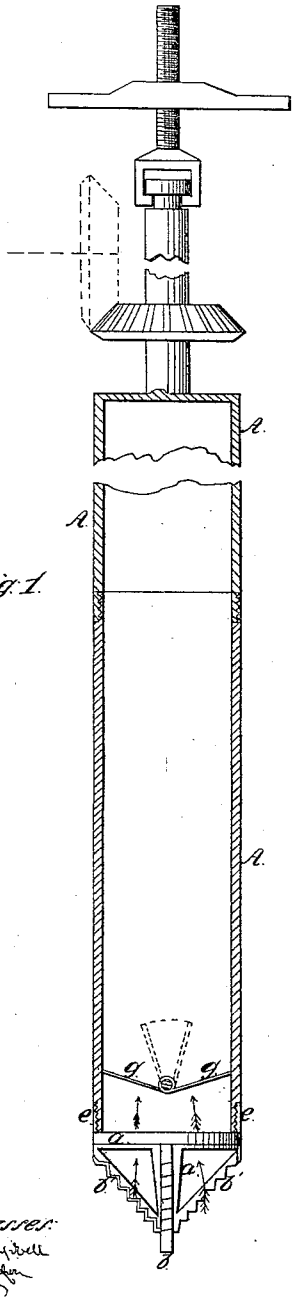


Fig. 2.

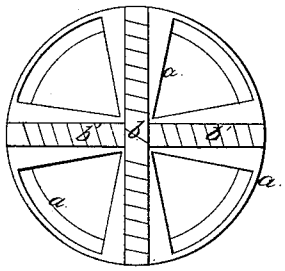


Fig. 3.

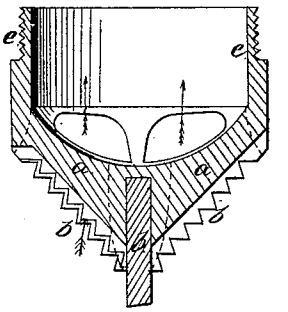
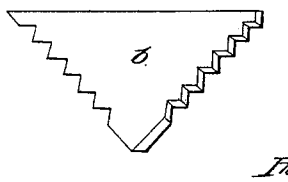


Fig. 4.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

H. B. WILLIAMS AND JOSEPH C. WILSON, OF APPLETON, WISCONSIN.

IMPROVED ROCK-DRILL.

Specification forming part of Letters Patent No. **51,376**, dated December 5, 1865.

To all whom it may concern:

Be it known that we, HAMILTON B. WILLIAMS and JOSEPH C. WILSON, of Appleton, in the county of Outagamie and State of Wisconsin, have invented a new and Improved Drill for Boring Wells; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side view of our improved drill applied to a hollow shaft. Fig. 2 is an enlarged end view of the drill. Fig. 3 is a vertical sectional view through the drill. Fig. 4 is a view of one of the cutters detached from the drill.

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

This invention consists in applying serrated chisels or cutters to a perforated cone, and combining this form of cutter with a hollow center-discharge shaft, having valves in it which open upward for the purpose of obtaining a very large amount of cutting-surface and allowing the free upward discharge of the detritus into the hollow shaft, as will be hereinafter described.

To enable others skilled in the art to understand our invention, we will describe its construction and operation.

The drill-point consists of an inverted cone, *a*, which is constructed with slots or grooves in its face for receiving the chisels or cutters *b b'*, as shown in Figs. 2 and 3. These grooves are made sufficiently deep to firmly hold and sustain the cutters in their proper places, and, if desirable, they may be dovetailed. The cutting-edges of the chisels are beveled and also notched or serrated, as shown in Figs. 2, 3, and 4. The chisel *b* (shown in Fig. 4) is of a right-angle form, and extends diametrically across the cone *a*. The chisels *b' b'* abut against the central chisel, *b*, so that three lines of cutters are presented beyond the surface of the cone *a*.

Between the cutters *b b'* are holes through the cone *a*, which holes admit of the upward discharge of the detritus as rapidly as it is formed by the cutters entering the earth or rock.

The upper end of the inverted cone *a* has a male screw-flange, *e*, projecting from it, which enters the lower end of the hollow shaft A and secures the cone to this shaft. Directly above the cone *a*, and within the shaft A, is a butterfly-valve, *g g*, the wings of which open upward and allow the detritus to pass freely upward, but prevent it from returning again.

We intend constructing the hollow drill-shaft A in sections of ten or more feet in length, and secure these sections together by means of male and female screw-couplings, which are so constructed as not to increase the diameter of the shaft at the joints.

If desirable, the shaft A may be made slightly smaller in diameter than the base of the cone *a* for a considerable length, and then this shaft may be made much smaller, thus obviating friction between the shaft and the wall of the well.

We propose to have valves arranged at certain intervals apart in the pipe or shaft A, to serve as traps for preventing the return of the detritus as it is successively elevated by suitable pumping machinery above the several valves.

The drill thus described may be operated like the common rotary drills, with the single exception that our drill must be partially restrained from penetrating the rock or indurated strata too rapidly.

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

1. A perforated conical drill-head, *a*, which is provided with serrated cutting-edges *b b'*, substantially as described.

2. The combination of a hollow sectional shaft, A, with a perforated central-discharge drill, which is constructed of a conical form, substantially as described.

Witness our hands in the matter of our application for a patent for a new and useful drill for boring Artesian wells for water, oil, blasting minerals, &c.

H. B. WILLIAMS.
JOSEPH C. WILSON.

Witnesses:
GEO. M. MILLER,
G. W. DODGE.