

No. 874,455.

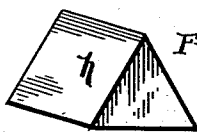
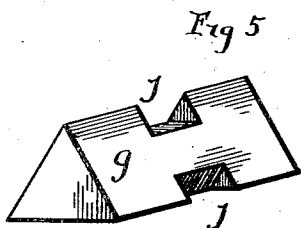
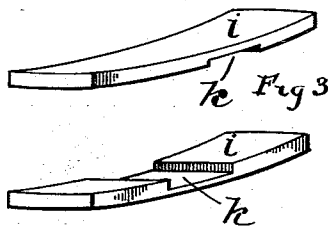
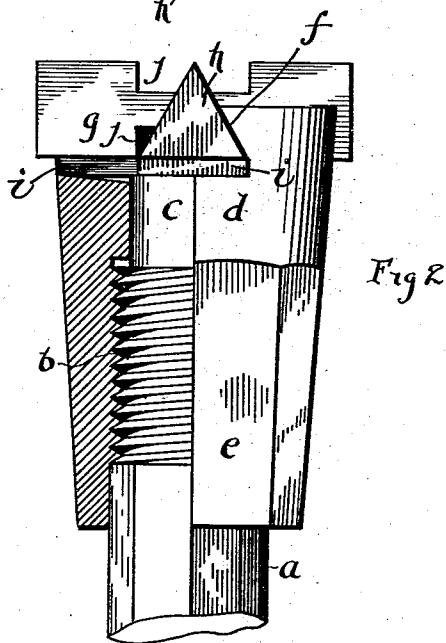
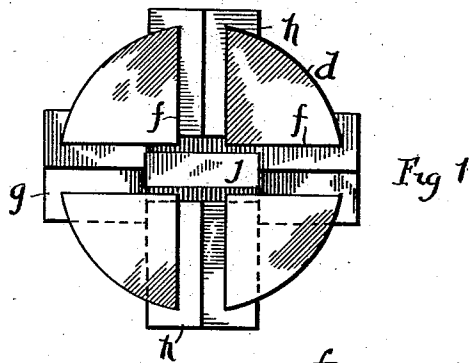
PATENTED DEC. 24, 1907.

F. V. W. SWANTON & B. PRICE.

ROCK DRILL.

APPLICATION FILED JULY 12, 1907.

2 SHEETS—SHEET 1.



Witnesses:
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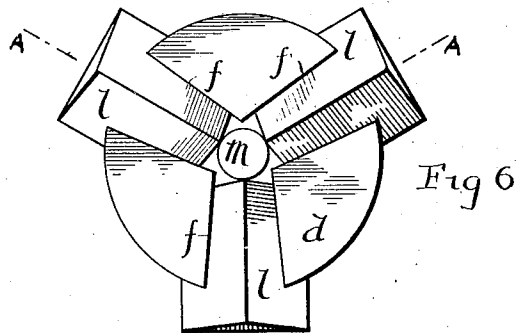


Fig 6

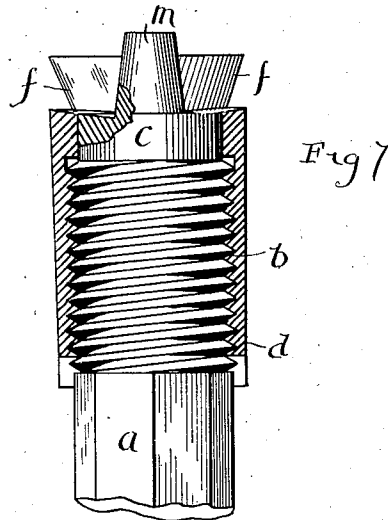


Fig 7

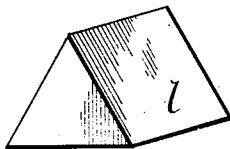
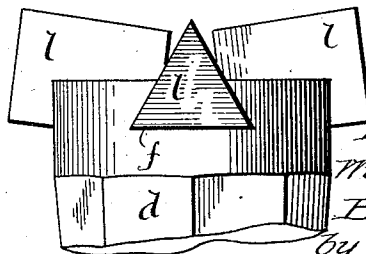


Fig 9

Fig 8



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UNITED STATES PATENT OFFICE.

FREDERICK VICTOR WILLIAM SWANTON AND BURT PRICE, OF BRAAMFONTAIN,
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ROCK-DRILL.

No. 874,455.

Specification of Letters Patent.

Patented Dec. 24, 1907.

Application filed July 12, 1907. Serial No. 383,545.

To all whom it may concern:

Be it known that we, FREDERICK VICTOR WILLIAM SWANTON and BURT PRICE, subjects of the King of Great Britain, and residents, respectively, of 48 Juta street, Braamfontain, Johannesburg, and 112 de Korte street, Braamfontain, Johannesburg, Transvaal, have invented a new and useful Improvement in Rock-Drills, of which the following is a specification.

This invention relates to improvements in rock drills of that class comprising a stock and a plurality of cutting elements removably secured thereto.

The invention has to do with a drill of this character and more particularly with an improved means for facilitating the removable locking of the cutting elements in the stock, its further object being to secure said elements in a manner to permit ready removal thereof and to provide and secure an effective anchorage.

The invention is illustrated in the accompanying drawings in which

Figure 1 is an end view of a rock drill embodying the main features of my invention, and Fig. 2 a side view, partly sectional, of a "star" drill embodying the invention, Fig. 3 shows the pressure plates hereinafter described, Fig. 4 is a perspective view of one of the cutting elements, Fig. 5 a similar view of another of the cutting elements, Fig. 6 is an end view of a modification of the invention, Fig. 7 is a section on the line A—A Fig. 6, the cutting elements being removed, Fig. 8 is an enlarged elevation with the cutting elements in position and Fig. 9 shows one of the cutting elements adapted for the second modification.

Referring to Figs. 1 to 5, *a* indicates the shank of the drill, which is screw-threaded at *b* and terminates in a cylindrical spigot *c*.

d is a separable bit stock which is tapered externally similarly to the head of solid drills and is made polygonal at *e* to receive a spanner. It is internally threaded to fit on to the threaded portion *b* of the shank and has above the threaded portion a central hole through which the spigot *c* may pass snugly. In the face of the stock are formed, at right angles to one another and intersecting at the axis, the undercut or dovetail slots *f* for the reception of the cutting bits *g*, *h*, and the pressure plates *i*. Bits of triangular section are employed, the section being preferably

also equilateral in order that the several edges may be used in turn for cutting. In the figure they are shown with flat faces, but where more obtuse and stronger edges are required, the faces are bellied out and vice versa to produce more acute cutting edges the faces are made concave. One long bit *g*, and two short bits *h* are provided; the former being long enough to extend slightly beyond the stock *d* at each side and the latter of such length as to touch the long bit at the center and project correspondingly beyond the stock. The edges of the long bit are cut away centrally to form recesses *j* into which the short bits lock as seen in Fig. 1; the object being to prevent lateral movement of the long bit, which, striking the rock as it does equally at either extremity, is liable to such displacement, whereas the short bits, on the other hand, tend to move inwardly only under the influence of the blows upon their outer extremities. The absence of cutting edges at the center of the tool also is found to increase the efficiency of the drill; and it moreover permits the introduction of water to the bore-hole through the shank, which may be made hollow for this purpose. Under the bits in each slot are inserted the pressure plates *i*, which are grooved out centrally at *k* to permit of their lying in the same plane. These plates are made of resilient metal and are initially curved upwardly as seen in Fig. 3.

In preparing the drill for use the pressure plates *i* are put into the bottom of the slots *f*, the long bit *g* is slid into place and the short bits *h* are thrust into their slot from each side to engage with the recesses *j* in the long bit *g*. The stock *d* is then screwed down on to the shank *a*, whereby pressure is applied by the spigot *c* to the intersection of the pressure plates *i* and transmitted by them, in consequence of their initial curvature, over the greater part of the base area of all the bits. The latter are thus forced and securely held between the pressure plates *i* and the overhanging edges of the dovetail slots *f*.

After the protruding edges of the bits have become worn down by use, the bits are withdrawn from the slots and replaced with fresh edges uppermost. Moreover as the wear is substantially confined to the outer extremity of the edges, the two short bits may be utilized for three further drillings by turning them end for end in the stock.

In the modification illustrated in Figs. 6 to 9 short bits *l* only are employed, in this instance three in number, though more or less may be used, and such bits are moreover all of similar form. They are so disposed as to slope in towards the center, which arrangement facilitates breaking the rock and obviates outward displacement of the bits. The pressure plates are dispensed with, pressure being applied directly to the bits *l* by the spigot *c* the upper surface of which is dished as shown in continuation of the sloping bottoms of the dovetail slots *f*. The spigot *c* is continued as a conical nose *m* to afford abutment for the inner end of the bits, which nose may in some cases be made detachable to enable it to be replaced when worn.

What I claim is:—

1. In a rock drill, a bit stock having undercut grooving on the face, triangular cutting means located in the grooved face and having an interlocking relation with each other and means for applying pressure to the underside of such cutting means to lock the same in position.

2. A rock drill comprising in combination a shank, a bit stock movable longitudinally thereupon and having undercut grooving on the face, triangular cutting means located in the grooved face and having an interlocking relation with each other and means operating upon relative movement of shank and stock to apply pressure to the underside of the cutting means to lock the same in position.

3. A rock drill comprising in combination a threaded shank, a bit stock threaded to screw thereon, said stock having undercut grooving in the face, triangular bits fitting therein and so disposed as to be engaged by

the extremity of the shank and to interlockingly engage each other.

4. A rock drill comprising in combination a threaded shank, a bit stock screwed thereon and having undercut grooving in the face, triangular bits fitting therein, pressure plates under the bits, said plates being adapted to be engaged by the extremity of the shank and to distribute the pressure therefrom evenly over the bits.

5. A "star" rock drill comprising a threaded shank, a bit stock screwed thereon and having two intersecting undercut grooves formed in the face, short triangular bits located in one such groove, a long triangular bit located in the other groove and having recesses for locking with the short bits, resilient pressure plates under the bits adapted to be engaged by the extremity of the shank and being initially curved so as to distribute the pressure from the shank evenly over the bits.

6. A rock drill comprising in combination, a bit stock provided with undercut grooving, cutters of angular cross section seating in said grooving, and a shank engaging the bases of said cutters with one of its ends and mechanically connected with said stock whereby relative movement of the stock and shank serves to force said cutters into engagement with said grooving.

In testimony whereof we affix our signature in presence of two witnesses.

FREDERICK VICTOR WILLIAM SWANTON.
BURT PRICE.

Witnesses:

ALFRED L. SPOOR,
WM. D. GORDON.