

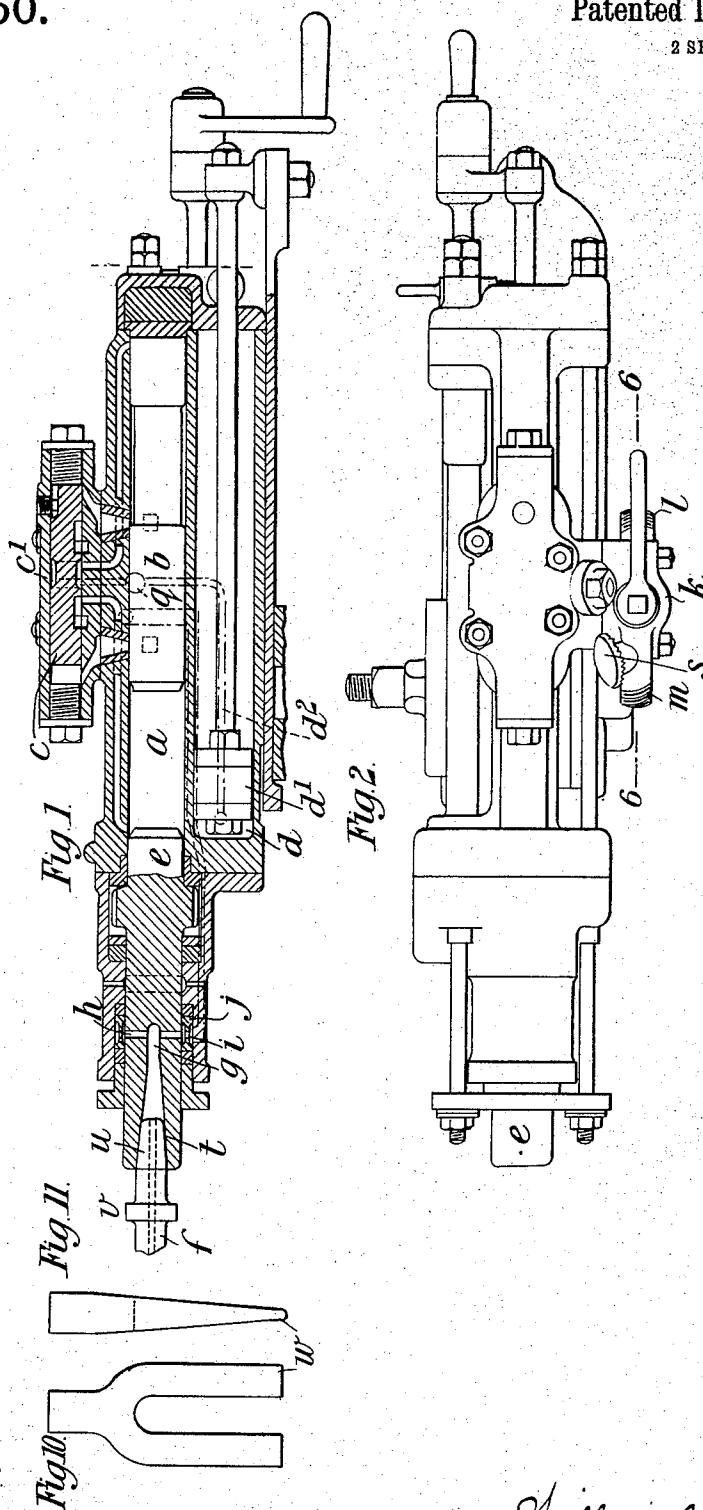
ROCK DRILL.

APPLICATION FILED AUG. 1, 1908.

944,750.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.



Witnesses.

J. K. Moore
R. E. Barry.

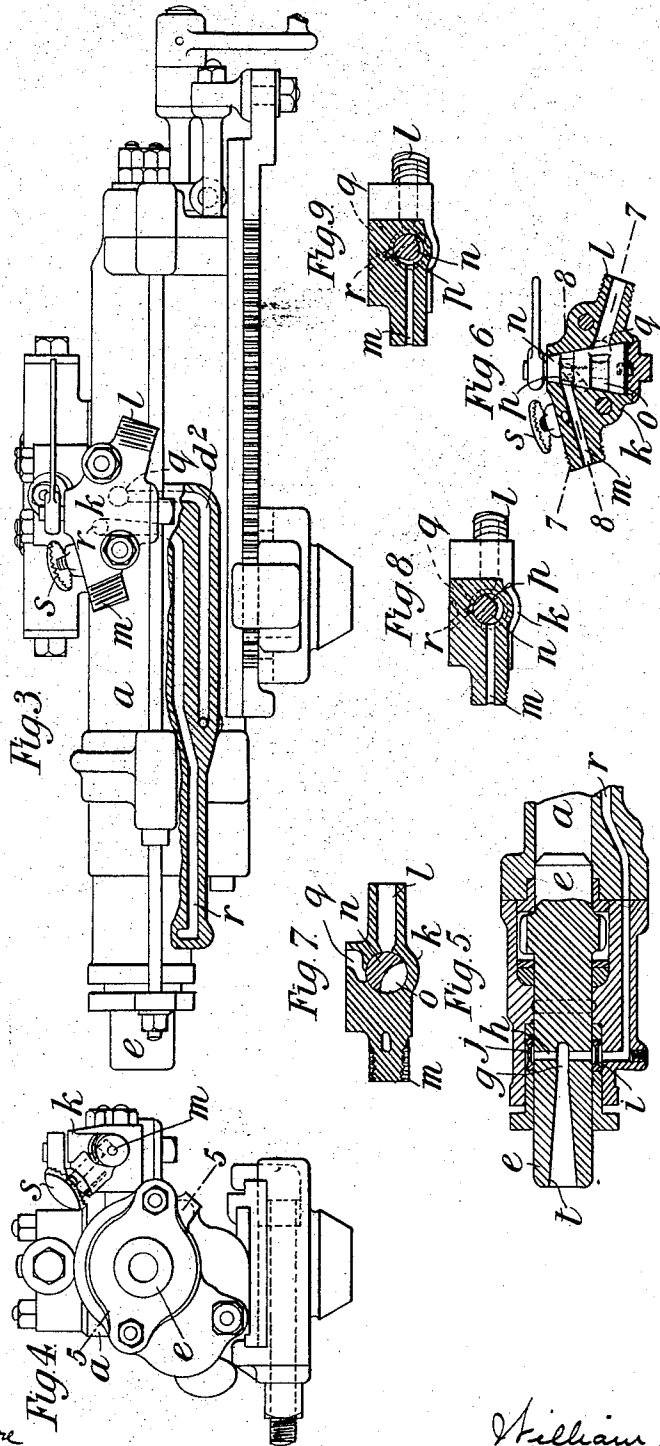
Inventor

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William C. Stephens
By Whitaker Prevoat
attys

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UNITED STATES PATENT OFFICE.

WILLIAM CHARLES STEPHENS, OF CORNWALL, ENGLAND,

ROCK-DRILL.

944,750.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed August 1, 1908. Serial No. 446,450.

To all whom it may concern:

Be it known that I, WILLIAM CHARLES STEPHENS, a subject of the King of Great Britain, residing at Carn Brea, Cornwall, England, have invented new and useful Improvements in or Connected with Rock-Drills, of which the following is a specification.

This invention relates to rock drills of the kind where water is used for allaying the dust formed by drilling and has for its object the provision of means whereby the supply of motive fluid for operating the drill and the supply of water can be simultaneously controlled instead of using separate controlling devices as is generally the case.

A further object is to provide against leakage where the drill bit enters its holder and to arrange for the easy extraction of the bit from the said holder.

According to the invention I provide a tap or valve which is formed with inlets and outlets for the motive fluid and water respectively and with corresponding recesses in the movable part of the tap or valve so that when the said part is moved the motive fluid and water will both be turned on or off. In practice I so arrange the recesses that the water is turned on before the motive fluid in order to insure the free flow of water before the drilling takes place. To prevent water leaking around the drill shank within the holder I provide a conical hole in the latter and I form the shank of corresponding shape. For the extraction of this form of bit from the holder I provide it with a collar and I employ a forked wedge to pass between it and the nose of the said holder.

To enable my invention to be fully understood I will describe the same by reference to the accompanying drawing, in which:—

Figure 1 is a longitudinal sectional elevation of a percussive rock drill of the kind having an automatic air-feed as described in the specification of my application Serial No. 446,449 of even date herewith and provided with my improvements. Fig. 2 is a plan, and Fig. 3 a sectional side elevation thereof. Fig. 4 is an elevation of the front end thereof. Fig. 5 is a section on the line 5—5, Fig. 4. Fig. 6 is a section on the line 6—6, Fig. 2 and Figs. 7 and 8 are respectively sections on the lines 7—7 and 8—8, Fig. 6. Fig. 9 is a similar view to Fig. 8 showing a different position of the parts.

Figs. 10 and 11 are views at right angles of a tool for removing the drill bit from its holder.

a is the main cylinder or hammer cylinder of the drill, *b* the piston thereof, and *c* the valve for controlling the supply of motive fluid to the said piston from the passage *c*¹. *d* is the feed cylinder and *d*¹ the piston thereof, *d*² being the supply port therefor. *e* is the drill holder or bolster against which the hammer *b* operates and which carries and forms the support for the hollow drill bit *f* and *g* is the central hole in the bolster into which the water to supply the bit flows from the holes *h*, *h* in communication with the recess *i* containing the grooved and perforated ring *j*. All of the said parts were described in the said specification of even date herewith.

k is the tap or cock for controlling the supply of pressure fluid to the main piston and feed piston and of water to the drill bit *f*. This tap has inlets *l* and *m* for the supply of the pressure fluid and water respectively. The plug *n* of the cock is formed with recesses *o*, *p*, the recess *o* being designed to connect the inlet *l* with the port *q* which is formed in one with the ports *c*¹ and *d*² for supplying the main and feed cylinders while the recess *p* is designed to bring the inlet *m* into communication with the passage *r* to the drill-bit *f*. The recess *p* is so arranged relatively with the recess *o* that when the plug *n* is turned slightly, when starting the drill, the water supply is first effected, the water passing to the cutting edges of the bit before the drill commences to work and thus insuring the free flow of water taking place before striking the rock to be drilled so that cut portions of rock are prevented from choking the hole in the bit. By further rotation of the plug *n* the pressure fluid is then admitted to the cylinders *a* and *d* and the drill then commences to operate the water being full on. I also provide a screw valve or regulator *s* in the inlet *m* so that the supply can be diminished.

t is the conical hole which I provide in the holder or bolster *e* and *u* is the correspondingly shaped shank on the bit *f* which when jammed back into the hole *t* makes a water-tight joint.

v is the collar formed on the bit *f* and *w*, Figs. 10 and 11, is the forked wedge which is placed between the said collar and the nose of the drill holder, the fork embracing

the drill shank. By a simple tap with a hammer the wedge forces the collar away from the drill holder and so extracts the drill bit.

5 Although I have described my improvements in connection with a drill of the percussive type it will be obvious that they can be employed with other types of drill employing water to allay dust while drilling.

10 Having now particularly described and ascertained the nature of my said invention and in what manner same is to be performed, I declare that what I claim is:—

15 In a rock drill, the combination with the drill cylinder and piston, and a drill bit holder provided with means for supplying water to the drill bit, of a controlling cock casing provided with a water inlet, a motive

fluid inlet, a water outlet connected with the drill bit holder and a motive fluid outlet operatively connected with the cylinder for supplying motive fluid thereto, of a single cock in said casing provided with a passage for connecting the motive fluid inlet and outlet, and a passage for connecting the water inlet and outlet, having a portion adapted to be brought into operative position in advance of the motive fluid passage, whereby water is admitted to the drill bit before the drill is brought into operation, substantially as described. 20 25 30

WILLIAM CHARLES STEPHENS.

Witnesses:

HOWARD FOX,
W. H. DANIELL.