No. 881,579. PATENTED MAR. 10, 1908.

H. HELLMAN & L. C. BAYLES.

WATER SUPPLYING ATTACHMENT FOR ROCK DRILLS.

APPLICATION FILED DEC. 18, 1906.

2 SHEETS—SHEET 1.

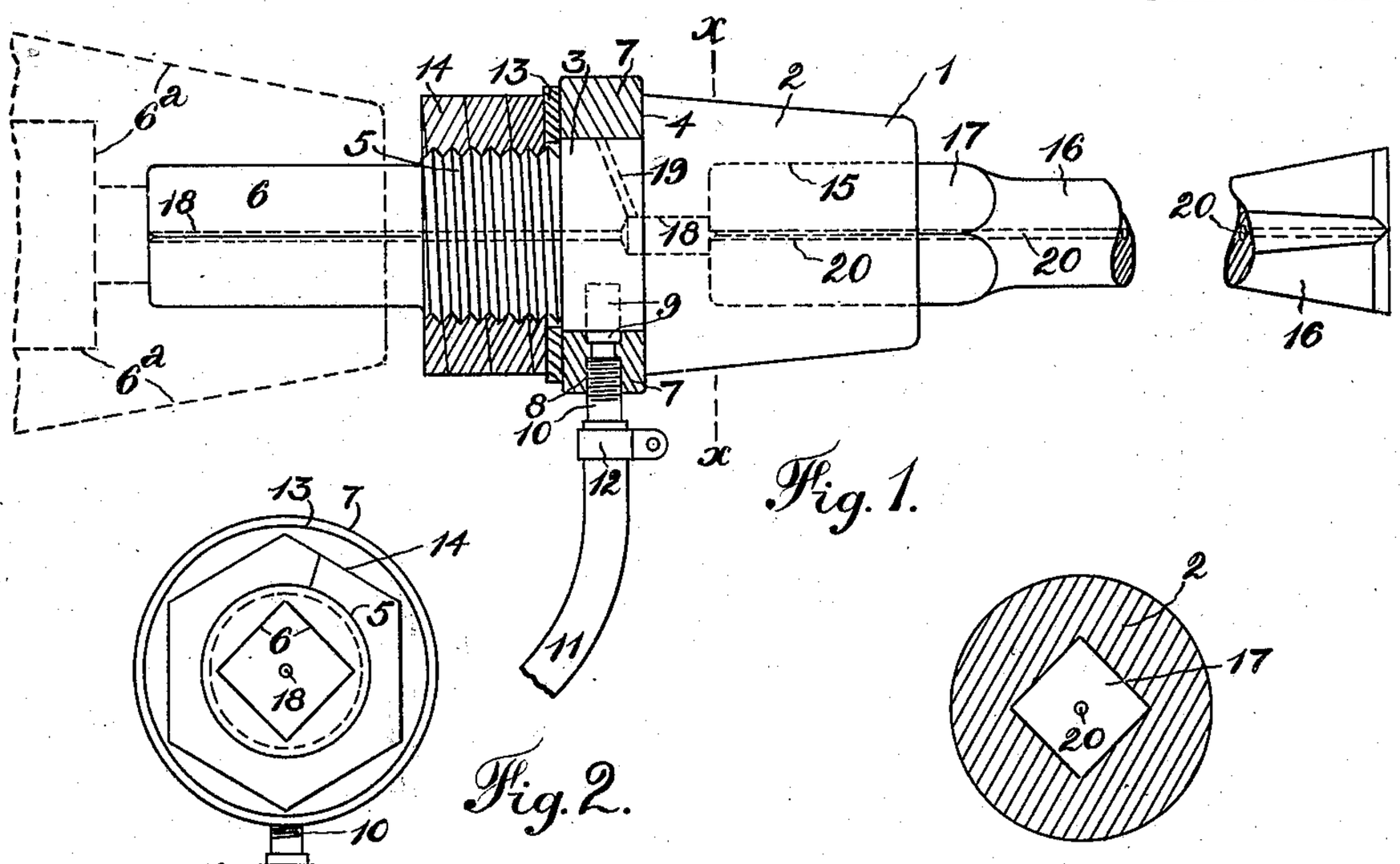

Fig. 1.

Fig. 2.

Fig. 3.

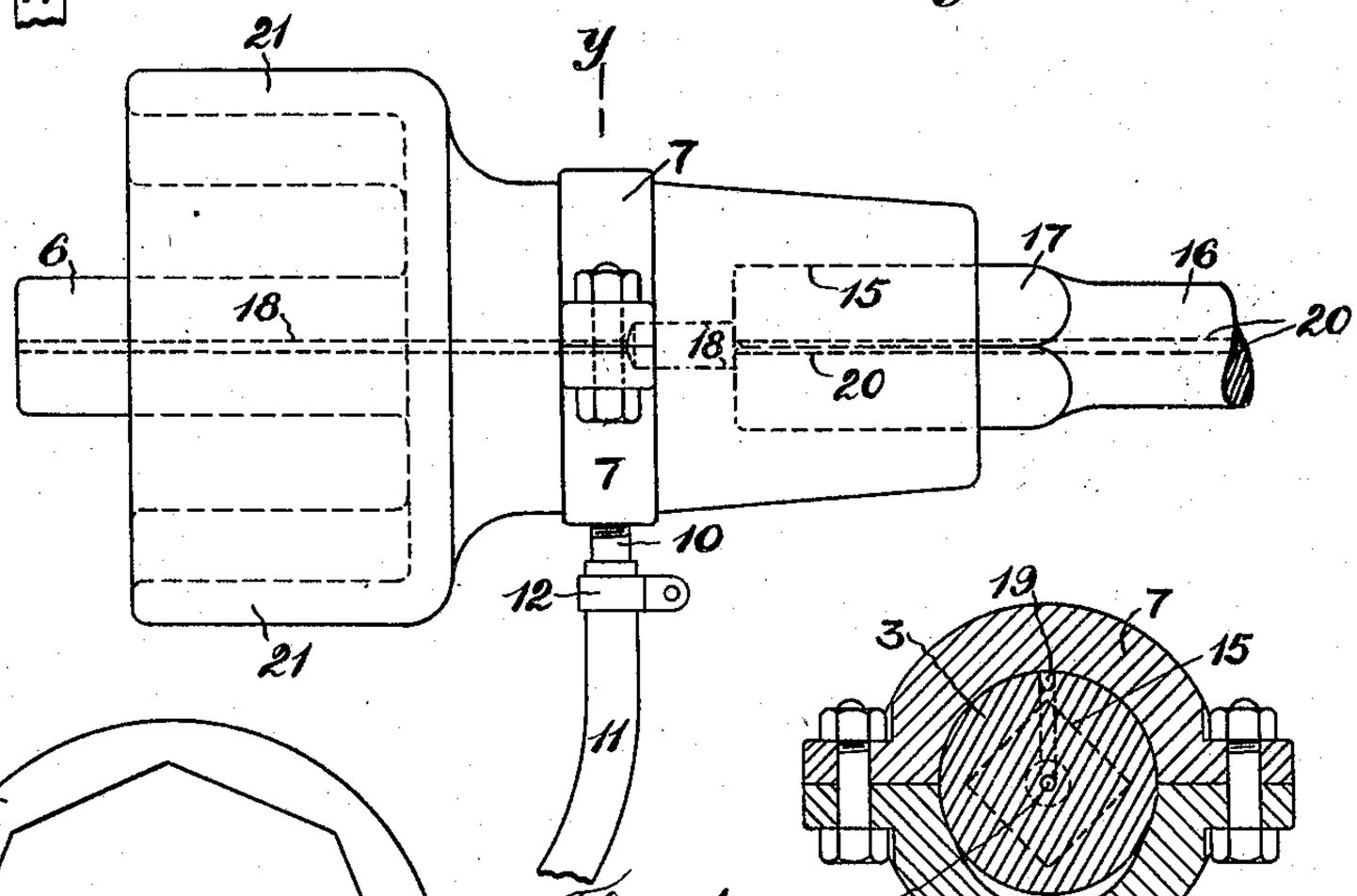

Fig. 4.

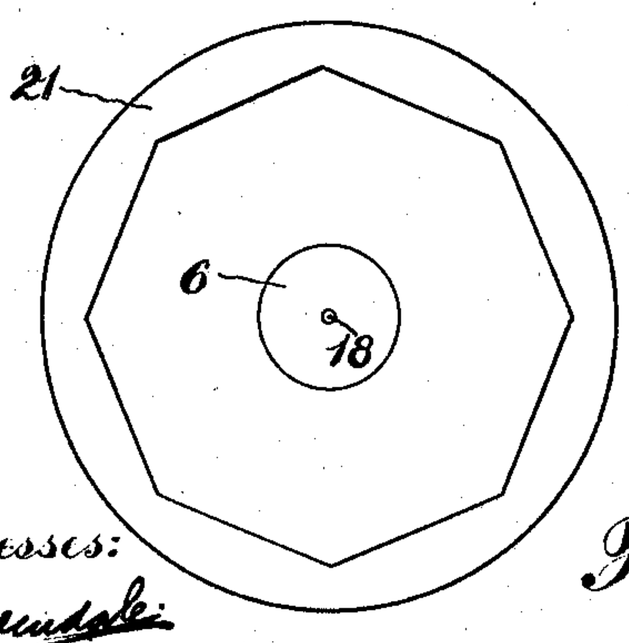

Fig. 5.

Fig. 6.

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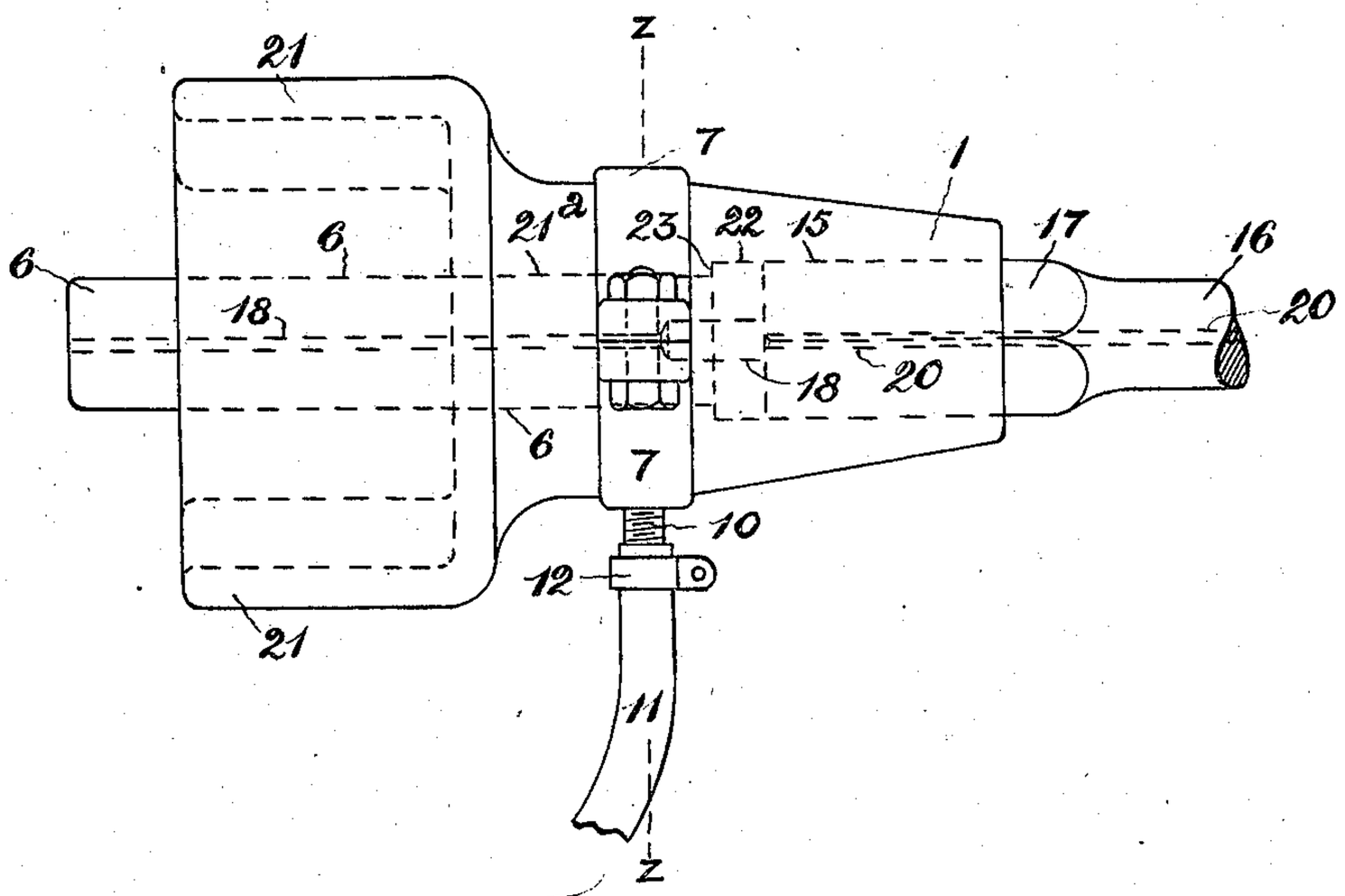

Fig. 7.

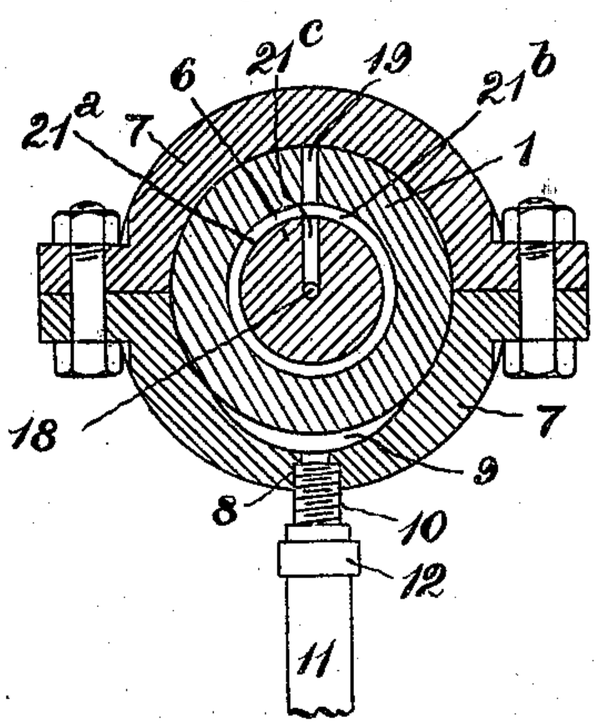

Fig. 8.

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UNITED STATES PATENT OFFICE.

HENRY HELLMAN AND LEWIS CONDICT BAYLES, OF JOHANNESBURG, TRANSVAAL.

WATER-SUPPLYING ATTACHMENT FOR ROCK-DRILLS.

No. 881,579. Specification of Letters Patent. Patented March 10, 1908.

Application filed December 18, 1906. Serial No. 348,394.

To all whom it may concern:

Be it known that we, HENRY HELLMAN and LEWIS CONDICT BAYLES, citizens of the United States, and residents of Johannesburg, Transvaal, have invented certain new and useful Improvements in Water-Supplying Attachments for Rock-Drills, of which the following is a specification.

This invention relates to rock-drilling machines, and in particular to that type of machine in which the rotation of the drilling or boring bit or tool is effected by or through the medium of the power cylinder.

In this type of machine it has previously been proposed to permanently mount at the front of the machine, either on the front head or on the forward end of the power cylinder, water supplying attachments for injecting into the bore hole at or in proximity to the cutting point of the bit, a quantity of water or water and air to convert the detritus as it is formed into sludge so as to prevent it issuing from the bore-hole in the form of dust. Now while the provision of such attachments is desirable in the drilling of upper or upwardly inclined holes they are not required in the drilling of downwardly inclined holes, as in this latter case water can be placed and will remain in the hole.

The object of the present improvements is to provide means whereby the water supply attachments may be detached with facility when the machine is being employed for the drilling of such downwardly inclined holes, and as readily attached to the machine when it is employed for drilling the upwardly inclined holes.

To this end the present invention consists in the employment of a detachable make-up piece interposed between the machine and the bit, said piece being arranged or located at the forward end of the machine, and carrying the water supplying attachments and the drilling or boring bit or tool.

The invention will be further described by aid of the accompanying drawing wherein,

Figure 1 is a part sectional elevation of the make-up piece and its attachments, Fig. 2 is a rear end elevation, Fig. 3 is a transverse section of Fig. 1 on the line *x*—*x*, Fig. 4 is a longitudinal elevation of a modification, Fig. 5 is a rear end elevation of Fig. 4, Fig. 6 is a transverse section of Fig. 4 on line *y*—*y*. Fig. 7 is a longitudinal elevation of a further modification, and Fig. 8 is a transverse section of Fig. 7 on line *z*—*z*.

In the construction illustrated in Figs. 1, 2 and 3, 1 designates the detachable make-up piece, which, constructed as shown, comprises a front conical portion 2, a cylindrical intermediate portion 3 forming with the front portion 1 a shoulder 4, a screw-threaded portion 5 at the rear of said part 3, and a part 6 of square or other suitable polygonal transverse section. This latter portion 6, which receives directly or indirectly the impacts of the hammer piston or reciprocating percussive member of the machine, is made of the same cross section as the hole in the front end of the machine, shown in dotted lines at 6^a, so that when it is projected thereinto it is compelled to rotate in unison therewith. On the cylindrical intermediate portion 3 is arranged the water supply swivel 7 which is constructed with a screw-threaded hole 8 communicating with an internal recess 9.

10 is the nipple screwed into the hole 8 and 11 the hose or other flexible pipe fixed to said nipple 10 by the hose-clamp 12. This pipe 11 serves for conveying water to the swivel 7. The swivel on the one side abuts the shoulder 4 and next the swivel 7 on the opposite side is placed a washer 13, and over the threaded portion 5 is screwed a lock-nut 14 of any desired construction.

Packings may be located at either side of the water swivel 7 and any other suitable means may be adopted for securing the water swivel round the make-up piece.

In the front portion 2 of the make-up piece is formed an axial hole 15 of polygonal cross section. This hole is preferably the same size and shape as the rear part 6, so that the bits 16 are interchangeable or may be employed in the machine either with or without the make-up piece. The shank or rear portion 17 of the bit 16 is made of the same shape in cross section as the hole 15 so that it is compelled to rotate with the make-up piece.

An axial hole 18 is provided longitudinally of the make-up piece. This hole 18 preferably increases somewhat in diameter at the forward end where it communicates with the hole 15. In the cylindrical part 3 one or more forwardly inclined holes 19 are formed which communicate with the hole 18. The forwardly inclined hole or holes 19 serve for intermittently placing the recess 9 in the

swivel 7 in communication with the hole 18. Constructed as shown, an intermittent water supply will be obtained, but it will be apparent that by making the recess 9 annular, or otherwise providing a continuous water space between the swivel 7 and part 3 or increasing the number of holes 19, a constant water supply may be obtained.

The bit 16 is constructed with an axial hole 20 terminating at or in proximity to the cutting end.

When the make-up piece 1 is in position in the machine 6^a, a quantity of the actuating fluid is free to pass through the axial hole 18 to commingle with the water introduced through the swivel 7 and to pass with it to the bottom of the bore-hole.

It will be apparent that the water supply may be used without the actuating fluid, in which event the axial hole 18 may be dispensed with.

In the modification illustrated in Figs. 4, 5 and 6, the water swivel 7 is shown constructed in two parts bolted together round the make-up piece, and the rear portion 6 which projects into the front end of the machine is made cylindrical, and round said part 6 is provided a cylindrical piece or cap 21 which fits over the front end of the machine. This cap 21 is made of polygonal section internally and the front end of the machine is made of corresponding section externally in order to insure the rotation of the make-up piece with the machine. In other respects this construction is identical with the previously described construction and similar numerals of reference are employed to designate the same or corresponding parts.

In the further modification illustrated in Figs. 7 and 8, the rear part 6 which projects into the front end of the machine is a separate piece reciprocable in a hole 21^a communicating at the inner end with the hole 15. The part 6 at its inner end is constructed with an enlargement 22 made of the same cross section as the hole 15 in which it slidingly fits. The enlargement 22 abuts the inner end of the shank 17 of the drill or bit 16. The shoulder 23 formed by the enlargement 22 engaging the bottom of the hole 15 round the forward end of the hole 21^a, operates as a stop for the piece 6, in a rearward direction.

21^b (see Fig. 8) is an annular groove formed in the make-up piece round the hole 21^a, placing the hole 19, which communicates with the recess 9 in the water swivel, in communication with a transverse hole 21^c in the part 6 leading to the hole 18.

What we claim as our invention and desire to protect by Letters Patent is:—

1. In a rock-drilling machine, the combination, with a drill, of a detachable make-up piece positioned at the front end of the drill and supported and rotated thereby and constructed at the forward end with a hole of non-circular transverse section, a bit constructed with a portion of corresponding non-circular transverse section loosely positioned in the hole in the make-up piece and supported and rotated thereby and constructed with a longitudinal hole communicating with the hole in the make-up piece and leading to the cutting end, a swivel mounted on the make-up piece and means for conducting water to the swivel, the make-up piece being constructed with passages for conveying water from the swivel and actuating fluid from the drill to the longitudinal hole in the bit.

2. In a rock-drilling machine, in combination, a drill, a detachable make-up piece loosely positioned at the front end thereof and supported and rotated thereby, a bit carried at the front of the make-up piece and having a longitudinal hole therein, a swivel mounted on and closely surrounding the make-up piece and having a water-conducting opening periodically placed in communication with the longitudinal hole in the bit upon rotation of the latter, for alternately supplying water to the bit aforesaid and for cutting off said supply.

3. In a rock-drilling machine, a drill a detachable make-up piece loosely positioned at the front end thereof and supported and rotated thereby, a bit carried at the front end of the make-up piece, said bit having a longitudinal passage and the make-up piece having a port or passage in communication therewith, a swivel mounted on and closely surrounding the make-up piece and having a short recess for periodically communicating with the port or passage in the make-up piece as the bit is rotated, to alternately supply water to the port or passage of the make-up piece and to cut off said supply, and means for conducting water to the swivel.

4. In a rock-drilling machine, in combination, a drill, a detachable make-up piece loosely positioned at the front end thereof and supported and rotated thereby, a bit carried at the front end of the make-up piece, said bit having a longitudinal passage and the make-up piece, having two ports or passages, one extending from the end of this make-up piece and communicating with the longitudinal passage of the bit and the other port or passage communicating with the drill cylinder, a swivel mounted round the make-up piece and having a recess adapted to communicate with the first-named port or passage in the make-up piece as the bit is rotated, to permit an intermittent supply of water to pass to the bit, and means for conducting water to the swivel.

5. In combination, a bit having a passage disposed longitudinally therein a detachable make-up piece secured to the aforesaid bit for rotating the latter, said make-up piece having a port in communication with the

passage of said bit, and a swivel mounted on and closely surrounding the make-up piece and having a short recess wherewith the port of the make-up piece is intermittently brought into and out of register as the bit is rotated, and means for supplying water to the opening in the swivel.

In witness whereof we have hereunto set our hands in the presence of two subscribing witnesses.

HENRY HELLMAN.
LEWIS CONDICT BAYLES.

Witnesses:
CHAS. OVENDALE,
FRED OVENDALE.