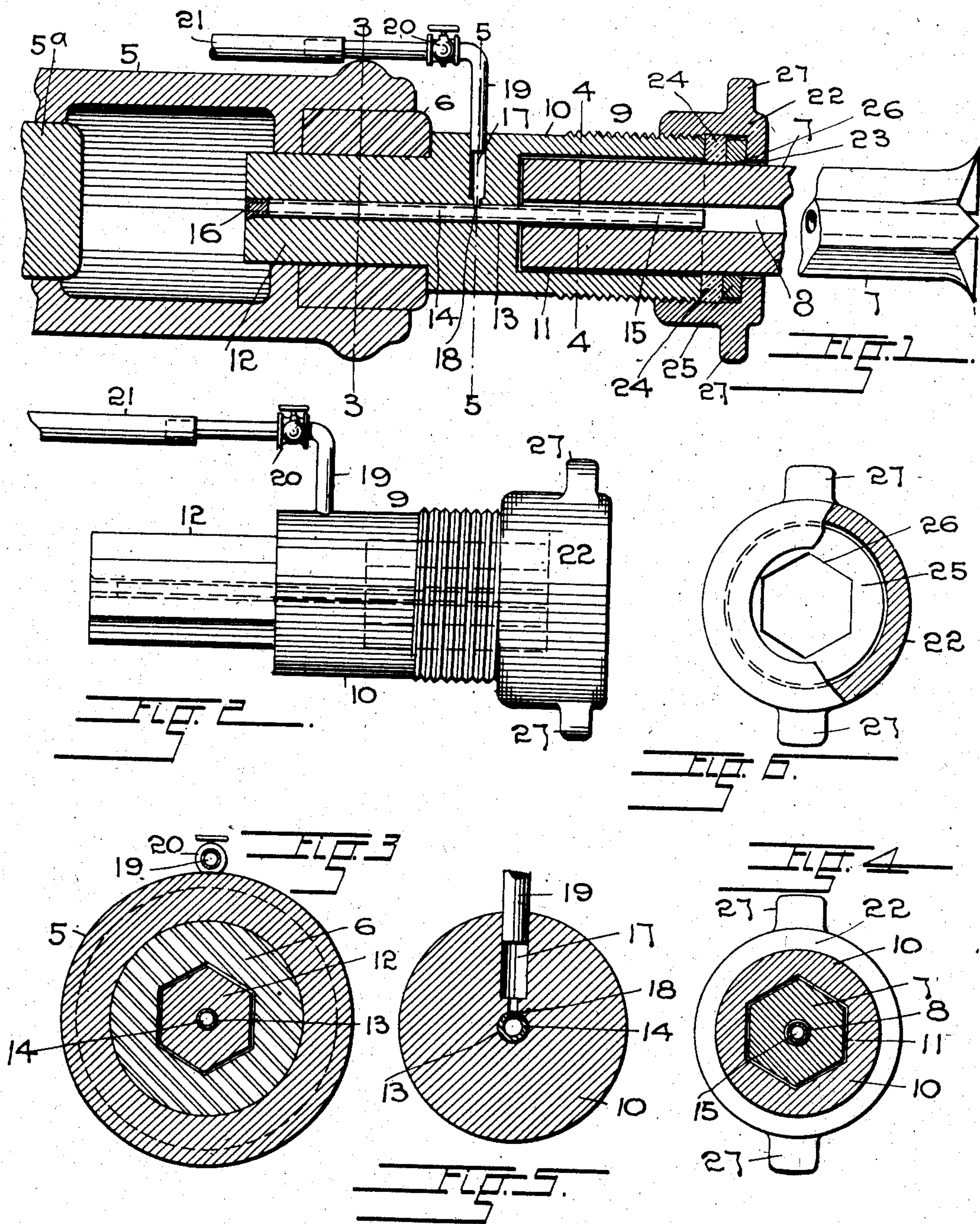


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A. L. STEPHENS & T. McGRATH.
DRILL CHUCK FOR USE ON HAMMER ROCK DRILLS.

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DRILL-CHUCK FOR USE ON HAMMER ROCK-DRILLS.

No. 864,270.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed June 16, 1906. Serial No. 322,020.

To all whom it may concern:

Be it known that we, ALBERT L. STEPHENS and THOMAS McGRATH, citizens of the United States of America, residing at Silver Plume, in the county of Clear Creek and State of Colorado, have invented certain new and useful Improvements in Drill-Chucks for Use on Hammer Rock-Drills, of which the following is a specification.

Our invention relates to a detachable drill chuck for use on drilling machines and more particularly on the class of machines in which a hammer has a reciprocating movement in a cylinder to impinge upon the end of the drill-bit.

Its principal object is to provide a device adapted to detachably connect the drill-bit with the machine in operative relation to the hammer and which has independent means to feed water through a central bore in the bit, to the face of the hole which is being bored in the rock.

The use of the detachable water-feeding chuck obviates the employment of separate machines for wet and dry drilling, effectively prevents the leakage of water common in the so-called water machines, invites simplification of the machines on which it is used and greatly facilitates the feeding of water into the drill hole.

We attain these objects by the mechanism illustrated in the accompanying drawings in the various views of which like parts are similarly designated and in which

Figure 1—represents a vertical section through the device, mounted in the hammer cylinder of a drilling machine and supporting the drill-bit, Fig. 2—a side elevation of the detached chuck, Fig. 3—a cross section taken along a line 3—3, Fig. 1, Fig. 4—a cross section taken along a line 4—4, Fig. 1, Fig. 5—an enlarged cross section along a line 5—5, Fig. 1 and Fig. 6—an end view of the chuck.

Referring to the drawings, 5 represents the front end of the hammer-cylinder of a hammer drilling machine, provided with the so-called drill-thimble 6 and the hammer 5*, and 7 the usually hexagonal drill-bit provided with a longitudinal bore or water passage 8, through which the water is fed into the drill hole in the rock or stone.

The detachable drill chuck 9 consists of a cylindrical body portion 10 having a polygonal socket 11, adapted to receive and hold the correspondingly shaped extremity of the drill-bit 7, and a diametrically reduced axially alined stem 12, the peripheral surface of which is polygonal to fit the correspondingly formed interior of the bushing or thimble 6. Chuck 9 is furthermore provided with a central, longitudinal bore 13 into which is fitted a tube 14, the outer extremity 15 of

which protrudes into socket 11 and forms the nozzle 55 through which, in practice, the water is introduced into the central bore 8 of the drill-bit. To facilitate adjustment and renewal of the tube, the bore 13 is preferably extended throughout the stem 12 and its mouth stopped by means of a suitable plug 16 after the tube is in its proper position. A radially extending, cylindrical passage 17 in the body portion 10 of the chuck, connects its circumferential surface with the longitudinal bore 13 and, in practice, communicates with a peripheral aperture 18 in the water-tube 13. Fitted into the mouth of passage 17 is an outwardly extending feed pipe 19, preferably bent to form an elbow and provided with a turn-valve or feed-cock 20, by means of which the flow of water is controlled. The outer extremity of pipe 19, extending beyond valve 20 connects with a flexible conduit or hose 21, which leads to a tank or other suitable water supply.

To render the joint between the drill-bit and the mouth of socket 11 impervious and thus prevent possible leakage, the outer extremity of the chuck is provided with an external screw thread to cooperate with the interior thread of a screw-collar or gland 22 which has a central cylindrical opening 23 through which, in practice, the drill bit loosely extends. An elastic gasket 24 and a therewith contiguous metal ring 25 occupy the annular space between the end surface of the chuck and the opposite surface of gland 22, the former to secure the water-tight joint, while the ring, having a polygonal opening 26 corresponding with the exterior shape of the drill-bit, holds the latter against rotation while the gland is being screwed onto the chuck for the purpose of compressing gasket 24. The screw collar is furthermore provided with radially extending wings 27 to facilitate manipulation.

Having thus described the mechanical construction of the device, its operation will be readily understood.

The reciprocating hammer of the machine impinges upon the extremity of stem 12 which extends within the hammer-cylinder 5 and impels the head of the drill-bit, fitted in socket 11, against the material it is desired to penetrate.

To prevent dust, the frequent cause of miner's consumption, or to clear the hole of drillings and thereby insure immediate contact of the point of the drill with the rock, the operator turns valve 20 and thus permits the water supplied through conduit 21, to flow through passage 17 and the therewith communicating nozzle 15, into the central bore 8 of the drill-bit, to be expelled at its point into the drill hole.

Having thus described our invention what we claim is:—

1. The combination with the cylinder of a drilling machine, of a socketed chuck having a longitudinal movement

therein, a longitudinally bored drill bit within the socket and a nozzle on the said chuck extending loosely into the bore of the bit the said chuck being provided with a passage communicating with the nozzle for supplying fluid thereto.

2. In combination, a drill chuck having a socketed body portion and a therewith axially aligned stem, a bore opening into its socket and a passage communicating with the bore and adapted to be connected with a water supply, a longitudinally bored drill bit within the socket, and a nozzle connecting the two bores.

3. A drill chuck comprising in combination a body having a water passage and a socketed extremity, and a nozzle communicating with the said passage and projecting into the said socket.

4. A drill chuck comprising in combination, a body having a socketed extremity and provided with a central bore and a radial water passage connected therewith, a tube in the bore protruding within the socket and having an aperture aligned with the said water passage, and a valve-controlled conduit connecting with the orifice of the said passage.

5. In combination, a drill chuck having a socketed ex-

trinity and a bore opening therein, a longitudinally bored drill bit within the socket, a gland surrounding the bit and movably connected with the adjacent extremity of the chuck, a gasket therein and a ring, fitting the bit, held loosely within said gland.

6. In combination a drill chuck having a socketed extremity and a bore opening therein, a collar screwed onto the extremity of the chuck, a gasket between the end of the chuck and the opposite portion of the collar, and a ring within the collar, contiguous to the gasket.

7. In combination, a socketed chuck, a longitudinally bored drill bit within the socket, and a nozzle on the said chuck extending loosely into the bore of the bit, the said chuck being provided with a passage communicating with the nozzle for supplying fluid thereto.

In testimony whereof we have affixed our signatures in presence of two witnesses.

ALBERT L. STEPHENS.
THOMAS McGRATH.

Witnesses:

H. H. NOYES,
E. E. MOORE.