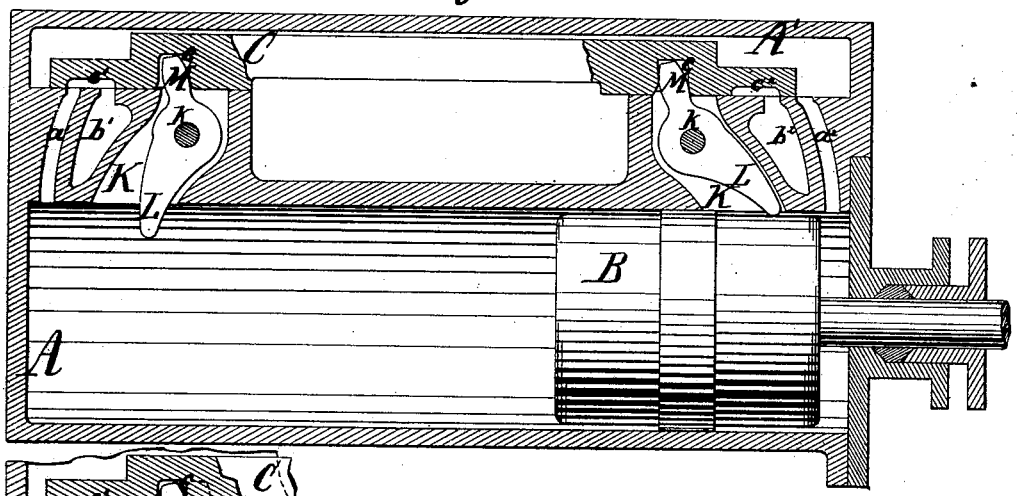
D. KENNEDY.

Valve-Movement for Rock-Drills.

No. 163,785. Patented May 25, 1875.

Fig: 1.



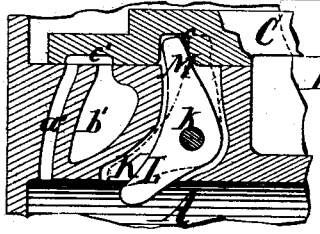


Fig: 2.

Witnesses:

M. A. Van Namee

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Inventor:

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UNITED STATES PATENT OFFICE.

DANIEL KENNEDY, OF NEW YORK, N. Y.

IMPROVEMENT IN VALVE-MOVEMENTS FOR ROCK-DRILLS.

Specification forming part of Letters Patent No. **163,785**, dated May 25, 1875; application filed April 7, 1875.

To all whom it may concern:

Be it known that I, DANIEL KENNEDY, of New York city, in the State of New York, have invented certain Improvements relating to Rock-Drilling Machines, of which the following is a specification:

I operate a slide-valve by means of levers mounted in the cylinder. I have devised means for making such a construction entirely successful.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a longitudinal section through an entire cylinder, with the valve and valve-operating levers. Fig. 2 is a section of a small portion, representing a modification in the proportions; the pivot or center of motion of the lever is lower, and the upper arm of the lever is longer.

Similar letters of reference indicate corresponding parts where they occur.

A is the body of the cylinder, formed with ports a^1 a^2, and with adjacent exhaust-ports b^1 b^2, to receive and discharge steam at each end. B is a piston, working therein. C is a peculiarly-formed slide-valve, with its face working steam-tight on a corresponding face of the cylinder. L M L M are levers turning on fixed centers k, and so mounted in spaces K, cored in the thick portion of the cylinder that they have liberty to oscillate. The arm L of each lever L M projects considerably beyond the cylinder-face into the cylinder A, and the arm M of each projects into a cavity, c, provided therefor in the slide-valve. The piston B is provided with tight-fitting packing at the center of its length, and the edge of each end is slightly rounded, so as to better act on the arms L L to throw them. The deep recesses c c in the valve C each receive the corresponding arm M of the corresponding lever L M, and is properly rounded to be smoothly acted on thereby. The slide-valve c has also hollow throats c^1 c^2, for the passage of the exhaust steam into the adjacent exhaust-port b^1 or b^2, as will be understood.

The steam being admitted to the steam-chest A′ through a screw-valve or other controlling means, not represented, holds the slide-valve C tightly to the cylinder-face, but with liberty to be moved. As the piston B moves to the right, it strikes the right-hand lever L M and throws the arm L thereof to the right, thereby throwing the arm M thereof and the slide-valve C to the left, and thus necessarily carrying the arm M of the left lever L M also to the left. This uncovers the port a^2 and admits steam to the right side of the piston, while it allows the steam from the left-hand side to be discharged through the exhaust-passage represented. The piston will, under these conditions, be driven actively to the left until it strikes the arm L of the left-hand lever L M, and throws the valve C and both the levers L M L M to the right, thus exhausting the steam from the right end of the cylinder and admitting steam to the left. In this condition, the piston with its attachments moves rapidly to the right. These reciprocations follow each other rapidly, and will continue so long as the steam is admitted.

The drill, not represented, may be attached by any ordinary or suitable means to the piston-rod d. The cylinder may be mounted in any ordinary or suitable manner to allow the drill to act on the rock. Although I have spoken of steam, it will be understood that the invention may be used with compressed air.

I propose to introduce stops in the steam-chest to prevent the slide-valve C from ever being thrown too far by any violent action of the machinery. The stops may be adjustable, and may be tipped with rubber, soft metal, wood, or such material as is best adapted to receive the concussion.

I claim as my invention—

The levers L M L M mounted on the centers k k, in combination with the slide-valve C c c^1 c^2, piston B, and cylinder A, and with the ports a^1 a^2 and b^1 b^2, operating together as herein specified.

In testimony whereof I have hereunto set my hand this 27th day of March, 1875, in the presence of two subscribing witnesses.

DANIEL KENNEDY.

Witnesses:

WM. C. DEY,

HENRY GENTNER.