

L. C. BAYLES.
VALVE MOTION FOR ROCK DRILLS.
APPLICATION FILED FEB. 1, 1910.

993,014.

Patented May 23, 1911.

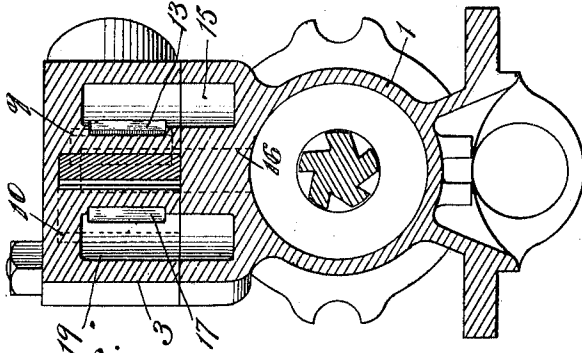


Fig. 2.

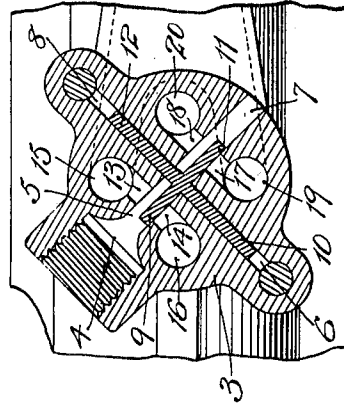


Fig. 4.

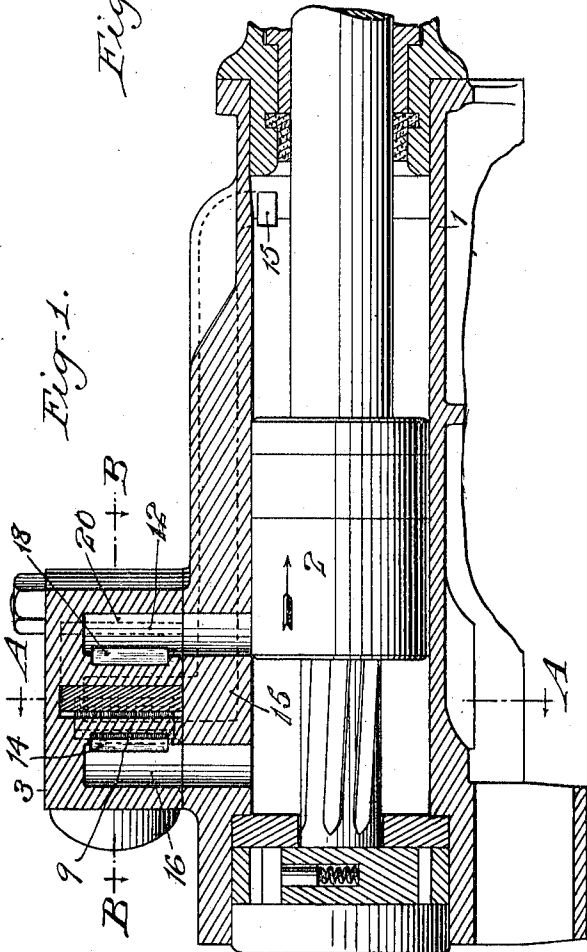


Fig. 1.

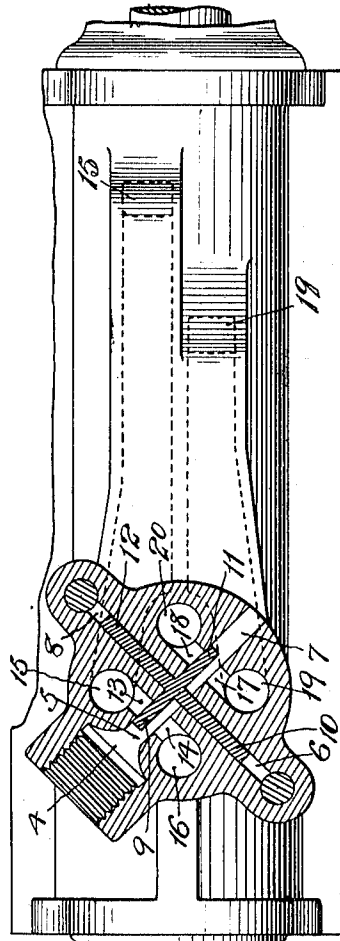


Fig. 3.

Witnesses:
F. George Barry.
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by his attorney
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UNITED STATES PATENT OFFICE.

LEWIS C. BAYLES, OF JOHANNESBURG, TRANSVAAL, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

VALVE-MOTION FOR ROCK-DRILLS.

993,014.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LEWIS C. BAYLES, a citizens of the United States, and resident of Johannesburg, Transvaal, have invented a new and useful Valve-Motion for Rock-Drills, of which the following is a specification.

This invention relates to a valve motion for rock drills and has for its object to provide certain improvements in the construction, form and operation of the valve mechanism whereby a valve may be employed which is very simple in construction, positive in its action and which has a very slight movement to accomplish the alternate opening and closing of the inlet and discharge passages for the opposite ends of the piston chamber, the action of the valve being automatic.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 represents in longitudinal central section so much of a rock drill as will give a clear understanding of my invention, Fig. 2 is a section taken in the plane of the line A—A of Fig. 1, looking in the direction of the arrows, Fig. 3 is a top plan view of the cylinder, the valve chest being shown in horizontal section taken in the plane of the line B—B of Fig. 1, and Fig. 4 is a detail view similar to Fig. 3, with the valve in its position opposite to that shown in Fig. 3.

The cylinder of the rock drill is denoted by 1 and its piston by 2.

The valve chest is denoted by 3, which valve chest is provided with a motive fluid inlet chamber 4. Slots, intersecting at right angles in the valve chest, from four branches 5, 6, 7, 8. A valve 9, 10, 11, 12, is fitted to reciprocate in a right line, its rear and front branches 10 and 12 being fitted to slide in the slot branches 6, 8, and its wings 9, 11, being located in the slot branches 5, 7, and have a limited movement from side to side thereof. The slot branch 7 opens to external atmosphere and forms the exhaust chamber. The opposite faces of the valve wing 9 are arranged to open and close ports 13, 14, of inlet passages 15, 16, leading to the front and rear of the cylinder chamber, respectively. The opposite faces of the valve wing 11 are fitted to open and close ports 17, 18, of exhaust passages 19, 20, leading from the front and back of the cylinder chamber.

Presupposing the parts to be in the position shown in Figs. 1, 2 and 3, with the piston 2 traveling in the direction shown by the arrow thereon, the wing 9 of the valve has opened the motive fluid inlet passage 16 to the back of the cylinder chamber and closed the motive fluid passage 15 to the front of the chamber and, at the same time, has opened the discharge passage 19 leading from the front end of the cylinder to external atmosphere and closed the exhaust passage 20 leading from the rear end of the cylinder chamber. As the piston 2 nears the limit of its forward movement, it will first close the discharge passage 19 and for the balance of its forward movement will compress the motive fluid inlet passage 15 sufficiently to throw the valve over into the position shown in Fig. 4, thus opening the motive fluid inlet passage 15 to the main inlet chamber 4 and close the motive fluid inlet passage 16 and, at the same time, open the discharge passage 20 and close the discharge passage 19. This will cause the piston to start on its return movement and as it nears the limit of its return movement, it will first close the discharge passage 20 and then compress the fluid sufficiently in the inlet passage 16 to throw the valve back into the position shown in Figs. 1, 2 and 3.

It will thus be seen that the valve and ports, constructed and arranged as herein set forth, permits the valve to control the opening and closing, not only of the inlet passages but also of the discharge passages so as to insure a sufficient overbalancing of pressure upon the valve wings to throw the valve automatically at the desired times to insure the proper reciprocation of the piston.

While I have shown this valve mechanism in connection with a rock drill, it is to be understood that I do not wish to limit myself to such use but contemplate its use wherever applicable in percussive machines or tools.

What I claim is:—

1. A cylinder having independent inlet and discharge passages for both ends thereof, its piston, a valve chest and a valve reciprocating in a right line and having valve wings arranged to control both the inlet and discharge passages.

2. A cylinder having independent inlet and discharge passages for both ends there-

of, its piston, a valve chest and a valve reciprocating in a right line and having valve wings arranged to open and close both the inlet and discharge passages.

5 3. A cylinder, its piston and a valve reciprocating in a right line and having a pair of wings, said cylinder having inlet and discharge passages leading to the faces of said valve wings.

10 4. A cylinder, its piston and a valve reciprocating in a right line and having a pair of wings, said cylinder having independent inlet and discharge passages for both ends thereof leading to the opposite faces of said valve wings.

15 5. A cylinder, its piston, a valve reciprocating in a right line and having a pair of wings, said cylinder having independent inlet and discharge passages for both ends

thereof, the inlet passages leading to the opposite faces of one valve wing and the outlet passages leading to the opposite faces of the other valve wing. 20

6. A cylinder, its piston, a valve chest, independent inlet and discharge passages for both ends of the cylinder having ports opening into the valve chest and a valve reciprocating in a right line perpendicular to the faces of the ports for opening and closing the same. 25 30

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this 26th day of January 1910.

LEWIS C. BAYLES.

Witnesses:

F. GEORGE BARRY,
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