

No. 615,379.

Patented Dec. 6, 1898.

A. J. BANT.
ROCK DRILL.

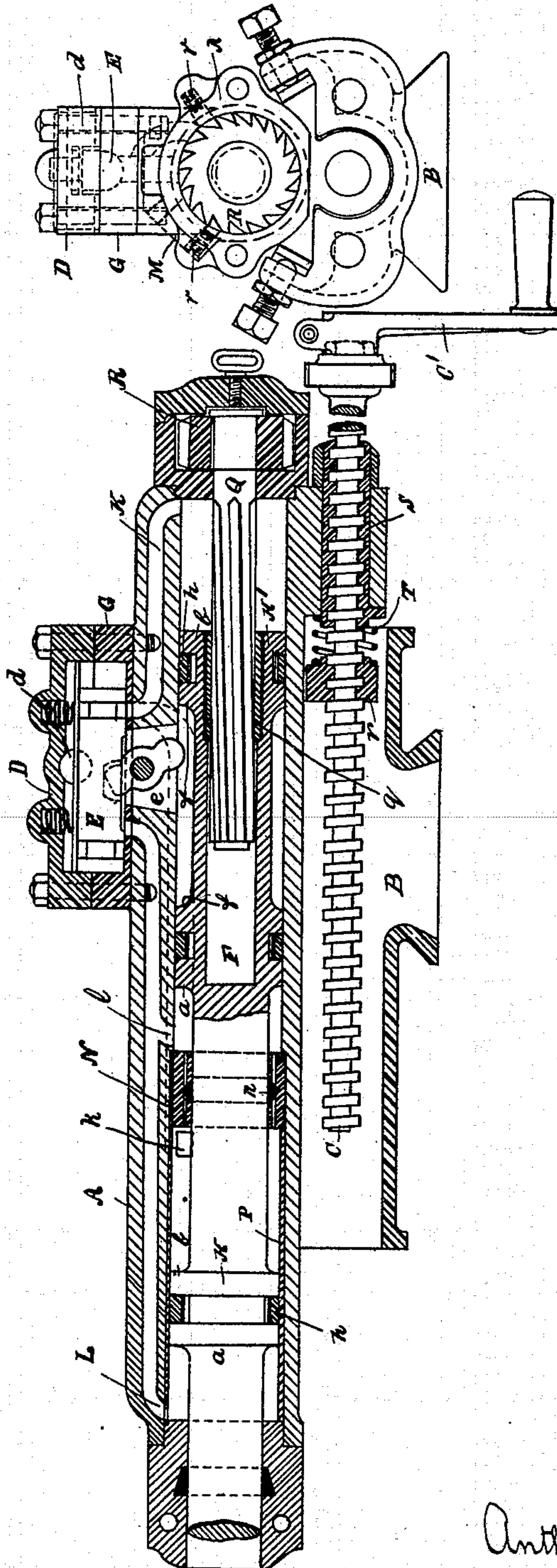
(Application filed Jan. 21, 1898.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 3

FIG. 1



Witnesses
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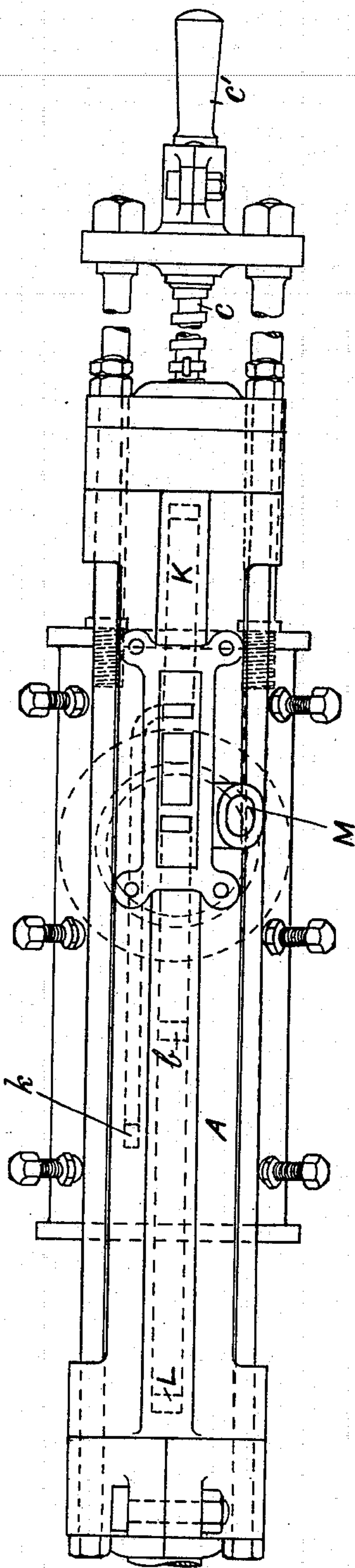
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2 Sheets—Sheet 2.

FIG. 2.



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UNITED STATES PATENT OFFICE.

ANTHONY JOHN BANT, OF JOHANNESBURG, SOUTH AFRICAN REPUBLIC.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 615,379, dated December 6, 1898.

Application filed January 21, 1898. Serial No. 667,666. (No model.)

To all whom it may concern:

Be it known that I, ANTHONY JOHN BANT, residing at Johannesburg, South African Republic, have invented Improvements in Rock-Drills, of which the following is a specification.

This invention relates to reciprocating rock-drills driven by steam or compressed air; and it consists in improvements whereby the surfaces of the drill-piston operated upon by the motive power are duplicated in conjunction with a suitable valve and ports, giving reduction of weight compared with other drills of the same power, economy of working, and greater adaptability to various kinds of work, and, further, by a special spring reaction or compensation upon the feed-screw the slack or wear in the screw is always taken up, giving increased durability to the drill as compared with others.

In order that this invention may be the better understood, I now proceed to describe the same with reference to the drawings hereto annexed and to the letters marked thereon.

Figure 1 is a longitudinal section through the drill and cradle. Fig. 2 is an outside plan of the same with the valve-box removed. Fig. 3 is an end view of the same.

The drill-cylinder A is mounted so as to slide freely on ways in the cradle B and is controlled as to its relative position to the cradle by the feed-screw C and handle C'.

The compressed air or steam enters the valve-box D by an inlet-port *d* and is admitted to the required ports, as hereinafter more fully described, by the reciprocation of the piston-valve E, actuated by a rocking tappet *e*, which is moved at either end of the stroke by the shoulders *f* of a recess in the main piston F.

An interchangeable valve-face G is introduced between the valve-box D and the cylinder A to facilitate renewal of the wearing parts.

The chief item of improvement in this drill lies in the arrangement of duplicate piston-heads H and H', provided with spring packing-rings *h* to make them steam or air tight, and in the arrangement of duplicate ports K *k* and L *l* from each end of the valve-chest D, so that when the piston-valve E is at one extremity of its stroke the ports K *k* admit

air or steam simultaneously to the two faces *b b* of the duplicate piston-heads H H'. The opposite faces of these heads *a a* are at the same time in communication, by the duplicate ports L *l*, with the central exhaust port and exit M in the same position of the valve E. Upon reversal of the valve E the opposite effects of air or steam supply to the faces *a a* and exhaust from the faces *b b* take place as regards the duplicate piston-heads. This double action of piston is effected by the introduction of a fixed abutment or diaphragm N, provided with spring packing-rings *n*, and which is conveniently and cheaply introduced and fixed into the plain cylinder-bore by a bush P, holding the said abutment against a shoulder in the bore.

The end of the piston-body F is bored to receive a rifled bar Q, which works in a rifled bush or nut *q*, screwed or otherwise fixed into the head of the piston-body F.

On the end of the rifled bar Q is keyed a ratchet-wheel R, into the teeth of which spring-pressed detents *r* engage. By this arrangement the inertia and momentum of the piston-body cause a partial rotation of the rifled bar at each stroke, causing a continued intermittent rotation of the piston-head and drill at each double stroke.

The drill is fed forward by the feed-screw C, operated by the handle C'. The feed-screw engages with a nut S, carried by a lug cast on the bottom of the cylinder A. The essential improvement upon this feeding device is the introduction of a spiral spring T upon the feed-screw, reacting between the nut S and lug, and a nut V upon the feed-screw, thus taking up any slack or wear in the threads of the feed-screw and nut S.

The advantages gained by these improvements are great reduction in weight compared with other drills of the same power, economy of labor, greater adaptability for all kinds of work, and increase of durability by the compensating spring on the feed-screw, removing continuous vibrations which would otherwise arise from slack between the feed-screw and feed-nut.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a rock-drill, the combination with a

piston-rod, of two heads, one of which has a long external recess, a fixed diaphragm through which the rod passes at a point between the heads, a valve-chest having two
5 steam-ports each leading to similar sides of the same heads, and an exhaust-port always in communication with the external recess on one of said heads, a cylinder having an escape-port also in communication with said recess,
10 a slide-valve controlling the steam and exhaust ports in the steam-chest, and a rock-arm engaging with the valve and projecting into the said recess in the piston-head, substantially as described.

15 2. In a rock-drill in combination, a piston operating a drill, having duplicate steam or air tight heads an intermediate fixed diaphragm or abutment adapted to permit rod

of said piston to work air-tight therethrough a port from each end of both parts of the cylinder containing the said piston-heads, duplicate ports from similar ends of cylinder chambers uniting in a single port in steam-chest, a central exhaust-port in steam-chest face, a
20 D-valve over said ports in steam-chest, a rocking lever under said D-valve to reciprocate same, and shoulders formed by a recess in one of said piston-heads to engage with and move said lever-head, substantially as described.

In testimony whereof I have signed my
30 name to this specification in the presence of two subscribing witnesses.

ANTHONY JOHN BANT.

Witnesses:

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