C. Burleigh.

Drilling Stone.

No. 113,850. Patented Apr. 18, 1871.

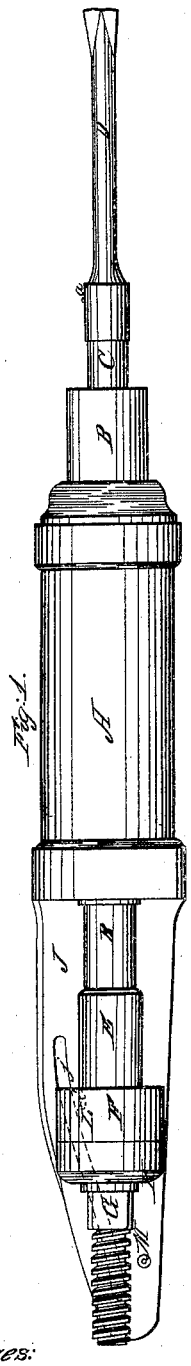

Fig. 1.

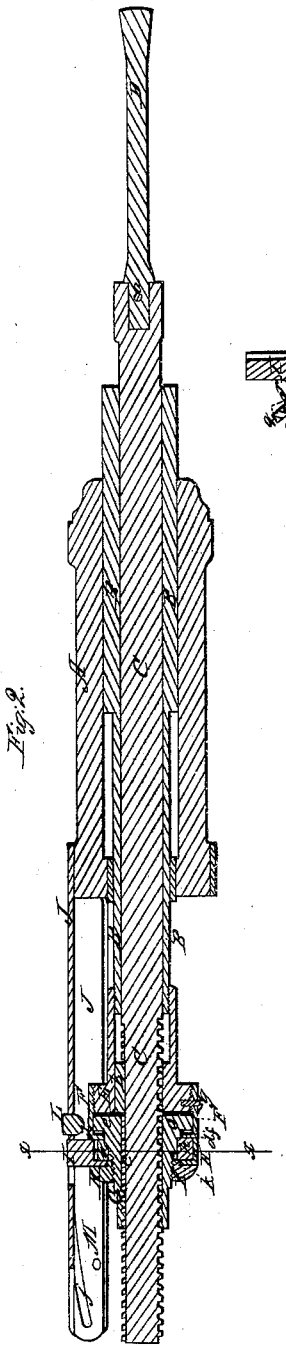

Fig. 2.

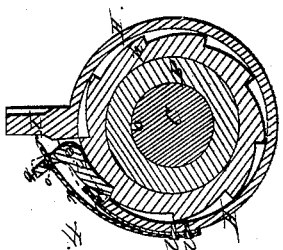

Fig. 4.

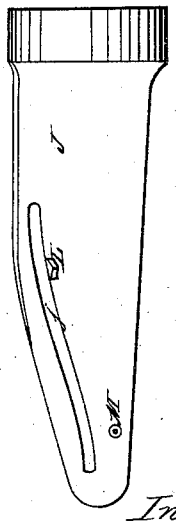

Fig. 3.

Witnesses:

James M. Woodbury

A. B. Lawrence

Inventor:

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UNITED STATES PATENT OFFICE

CHARLES BURLEIGH, OF FITCHBURG, MASSACHUSETTS, ASSIGNOR TO THE BURLEIGH ROCK DRILL COMPANY, OF SAME PLACE.

IMPROVEMENT IN MACHINERY FOR DRILLING ROCKS.

Specification forming part of Letters Patent No. **113,850**, dated April 18, 1871.

To all whom it may concern:

Be it known that I, CHARLES BURLEIGH, of Fitchburg, in the county of Worcester and State of Massachusetts, have invented certain Improvements in Machinery for Drilling Rocks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of a rock-drilling machine with my improvements applied thereto, the frame which supports it, and the valve-chest, with its valves and mechanism for operating the same being removed. Fig. 2 is a central longitudinal section through the same. Fig. 3 is a side elevation of the shell or casing detached. Fig. 4 is an enlarged section on the line *x x* of Fig. 2.

My present invention relates to certain improvements in machinery for drilling rocks, for which Letters Patent of the United States were granted to John W. Brooks, Stephen F. Gates, and myself on the 6th day of March, A. D. 1866; and my invention consists in improved mechanism connected with the drill-spindle by which the feed of the drill is regulated to conform to the character of the rock in which the drill is operating, so that when it does not penetrate the rock sufficiently far it shall not be fed at the succeeding stroke.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is a cylinder, within which works a hollow piston, B, driven by compressed air or steam in a well-known manner. Through the hollow piston B passes the drill spindle or holder C, to the forward end of which, at *a*, is secured the drill D.

E is a hub or head, which is screwed to the rear end of the hollow piston, and is provided with a feather, *b*, which fits into a spline, *c*, formed in the drill-spindle, whereby they are made to turn with each other. The rear end of the head E is provided with a screw-thread, over which fits a coupling, F, provided with a corresponding screw-thread at one end, while at its opposite end is formed a flange, *d*, between which and the enlarged head *e* of a screw-nut, G, is introduced a washer, *f*, of leather or other suitable elastic substance, which relieves the piston from the shock of the blow of the drill.

g is a screw, which passes through the coupling F into the head E, in order to prevent it from being screwed up against the face of the screw-nut G, and allow the latter to turn freely on the drill-spindle C. To the nut G is permanently secured a ring, *h*, which is provided with ratchet-teeth, as seen in Fig. 4; and over the ratchet *h* is fitted a band, H, in which is pivoted a pawl, *i*, and this band is provided with a pin or projection, I, which moves in a slot, *j*, formed in a curved shell or casing, J, secured to the cylinder A.

K is a screw-nut, which fits over the nut G and confines the band H in place, the nut K being provided with a flange, *k*, which rests upon the ratchet *h*, and allows the band H to be freely revolved around it. To the outside of the ratchet-band H, at *l*, are riveted the springs *m n*, the outer end of the spring *m* pressing the pawl *i* against the ratchet *h* until thrown back in a manner now to be described.

On the outer end of the spring *n* is formed a shoulder, *o*, which catches over the edge of a slot, *p*, made through the arm *q* of the pawl *i*, (See Fig. 4,) to retain it out of contact with the ratchet until the drill advances sufficiently far into the rock to cause the end *r* of the spring *n* to come in contact with a cam or projection, L, on the inside of the casing J, at the edge of the slot *j*, by which means the end *r* of the spring *n* is depressed so as to carry the shoulder *o* below the edge of the slot *p*, when the pawl *i* is pressed by the spring *m* into contact with the ratchet *h*, and engages with the next tooth. As the projection I travels through the slot *j* on the backward stroke of the drill D, the band H is turned, carrying with it the ratchet *h* and nut G, which thus feeds the spindle C with its drill D, as required, the spindle being prevented from turning by the spline and feather, as before described.

M is a projection on the inside of the casing, near its rear end, against which the arm *q* of the pawl *i* strikes on the backward stroke of the drill, raising the pawl out of the teeth of

the ratchet against the resistance of the spring *m* until the shoulder *o* is caught by the edge of the slot *p*, thus retaining the pawl in the position seen in blue, Fig. 4. If, however, on the forward stroke, the drill does not penetrate the rock sufficiently far to require to be fed forward, the end *r* of the spring *n* will not advance far enough to strike against the projection L, and the pawl will not be released to take another tooth, and consequently no feed is produced.

Instead of feeding by the ratchet and pawl, the feed may be operated by friction produced by the pressure of a spring or other suitable device, the pressure being removed and the feed checked when the drill does not penetrate the rock sufficiently to require to be fed forward.

Claim.

I claim—

The pawl with its ratchet, or their equivalents, applied to the rock-drilling machine in the manner described, when the said pawl or equivalent device is automatically operated to regulate the feed, as set forth.

CHARLES BURLEIGH.

Witnesses:

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