(No Model.)

W. BRADY & D. FITZPATRICK.

HAND POWER ROCK DRILL.

No. 344,076. Patented June 22, 1886.

Fig. 2.

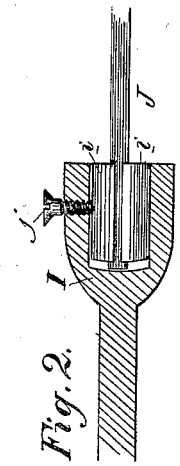


Fig. 3.

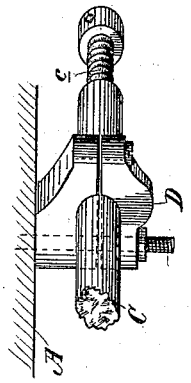
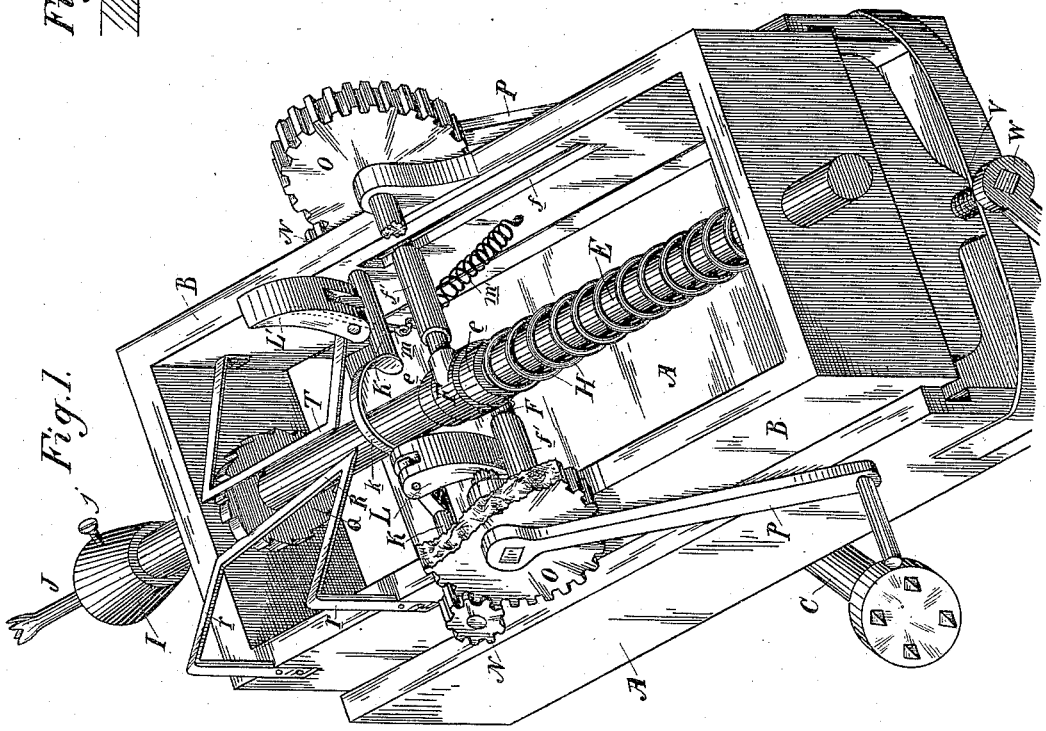


Fig. 1.



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UNITED STATES PATENT OFFICE.

WILLIAM BRADY AND DANIEL FITZPATRICK, OF VIRGINIA CITY, NEVADA.

HAND-POWER ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 344,076, dated June 22, 1886.

Application filed October 27, 1885. Serial No. 181,109. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM BRADY and DANIEL FITZPATRICK, of Virginia City, Storey county, State of Nevada, have invented an Improvement in Hand-Power Rock-Drills; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to a new and useful rock-drill of that class in which the drill is carried by a sliding carriage and is actuated by means of cams and a spring; and our invention consists in the arrangement and combination of parts forming the entire machine.

The object of our invention is to provide a simple and effective rock-drill adapted to be operated by hand-power.

Referring to the accompanying drawings, Figure 1 is a perspective view of our rock-drill. Fig. 2 is a section of the chuck I. Fig. 3 is a view of the attachment of the supporting-pillar.

A is a frame, in the sides of which is mounted the sliding carriage B.

C is the supporting pillar or bar, pivoted in a suitable clamping device, D, which is itself pivoted to the frame A, whereby the drill may be turned in any direction or to any angle. The supporting pillar or bar is adapted to be tightened against the walls of the drift in any suitable manner, as by the screw *c*.

Mounted longitudinally in the carriage B is the drill-spindle E, the center of which is provided with two collars, *e*, and passes loosely through a cross-bar, F, the ends of which bar extend within and are guided by grooves *f*, made in the sides of the carriage B.

H is a strong spring by which the spindle E is thrown forward.

Upon the forward end of the spindle is a chuck, I, consisting of a chambered barrel, in the socket of which are seated two jaws, *i*, between which the shank of the drill-bit J is fitted. A set-screw, *j*, sets up the jaws *i* to clamp the drill-bit. This chuck is adapted to receive the drill-bits just as they are, without the expense of turning or dressing them.

Mounted in the sides of the carriage B, forward of the grooves in said carriage, are the short shafts K, connected by a link, *k*, whereby they are strengthened. Pivoted or jointed to ears upon the shafts are the operating-cams L L′, which are so pivoted to their bearings as to have a motion on their pivots but in one direction. One of these cams, L, is simply a gravitating one, adapted to fall to its position, while the other, L′, is provided with an arm, *m*, and a spring, *m′*, whereby it is raised positively to its position. The gravitating cam is located in such a position that when below the shaft F, against the anti-friction roller or sleeve *f′* on which it bears, it is adapted as its shaft is lowered to force the cross-bar back, thus throwing the drill-spindle backward against its spring. While this movement is taking place the spring-cam L′ on the other side is rising to a vertical position. When the cross-bar is released from the gravitating cam, the drill is thrown forward to deliver its blow. The movement of the shafts K in the reverse direction causes the spring-cam to bear backward against the sleeve *f′* on its side of the cross-bar, thus forcing it back and allowing, just before it releases it, the gravitating cam to drop by the cross-bar to its original position. Then the spring-cam relieves the cross-bar and the drill springs forward to deliver its blow. The movement in the first direction causes the gravitating cam to operate as described in the first instance while the spring-cam is pressing under the cross-bar, until just before the gravitating cam releases its impingment the spring-cam is released, when it springs to its upright position. In this way, by the oscillation of the shafts K, the drill is forced back and is thrown forward to its work.

The means by which the oscillation of the shafts K is effected consist of the pinions N on their outer ends, the gear-wheels O, meshing with them, and the long hand-levers P. It is designed for two men to work the drill together—one on each side of the operating-levers P.

The means by which the drill is rotated during its work consist of the ratchet-wheel Q, near the forward end of the drill-spindle, in the teeth of which the blade, strip, or pawl R rests. This blade is carried in the ends of arms *r*, which are pivoted in the top of standards S, secured to the sides of the carriage, and said blade is carried or mounted at an in-

clination to the line or direction of reciprocation of the drill-spindle. The direction of inclination is such that as the drill-spindle moves back under the influence of the cams one of the teeth of the ratchet-wheel, following the inclination of the blade, causes the spindle to partially rotate. Then, when the spindle moves forward, a fresh tooth is presented for the engagement of the forward end of the blade, and the backward movement causes another partial rotation. In order to hold the spindle to the position to which it has been rotated and prevent its turning back during its forward stroke, we have the retaining blade, strip, or pawl T, secured to the opposite side of the carriage and adapted to engage the teeth of the ratchet, as shown.

The means by which the carriage B, with its drill mechanism, is advanced consist of the screw V and crank W.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a rock-drill, the sliding carriage B and reciprocating spring drill-spindle E, provided with collars *e e*, in combination with a cross-bar, F, fitted in grooves in the side of the carriage and having a central portion, through which the spindle passes, the oppositely-located oscillating shafts K, mounted in the sides of the carriage, a spring-actuated cam, L, on one of the shafts K, and a gravitating cam, L′, on the opposite shaft arranged with relation to the other cam, substantially as herein described.

2. In a rock-drill, the sliding carriage B, reciprocating spring drill-spindle E, and cross-bar F, as described, in combination with the shafts K, mounted in the sides of the carriage, the pivoted gravitating cam L on one shaft and the pivoted spring-cam L′ on the other, adapted to bear against the cross-bar and force back and release the drill-spindle, and the mechanism by which said shafts are oscillated, consisting of the pinions N on their ends, the large gears O, and the long levers P on each side, substantially as herein described.

3. In a rock-drill as herein described, the reciprocating spring drill-spindle E and cross-bar F, in combination with the oscillating short shafts K, the link *k*, connecting the shafts, and the pivoted gravitating cam L on one shaft and the pivoted spring-cam L′ on the other, arranged and operating substantially as herein described.

4. In a rock-drill, the reciprocating drill-spindle E, having a ratchet-wheel, Q, in combination with the blade, strip, or pawl R, mounted at an angle with the direction of reciprocation of the spindle and resting in the teeth of the ratchet-wheel, whereby said spindle is partially rotated by its own motion, substantially as herein described.

5. In a rock-drill, the reciprocating drill-spindle E, having a ratchet-wheel, Q, in combination with the blade, strip, or pawl R, mounted at an angle with the line of reciprocation of the spindle and resting in the teeth of the ratchet-wheel, whereby said spindle is automatically rotated, and the retaining blade, strip, or pawl T, engaging with the ratchet, whereby the spindle is held temporarily to the position to which it has been rotated, substantially as herein described.

6. A hand-power rock-drill consisting of the combination of the frame A, the pivoted and adjustable supporting and steadying pillar C, the sliding carriage B, the drill-spindle mounted therein and having a drill-bit, J, the cross-bar F, fitted to slide in grooves in the carriage and connected to the drill-spindle, as described, the oppositely-placed shafts mounted in the carriage, the spring-actuated and gravitating cams L L′, pivoted to the shafts, the gears N and O on the cross-bar, the levers P, mechanism for rotating the spindle, consisting of a ratchet-wheel, the actuating blade, strip, or pawl R, arranged at an angle to the reciprocating movements of the spindle, and the retaining-strip T, substantially as herein described.

In witness whereof we have hereunto set our hands.

WILLIAM BRADY.
DANIEL FITZPATRICK.

Witnesses:
P. E. SHANNON,
R. U. STRONG.