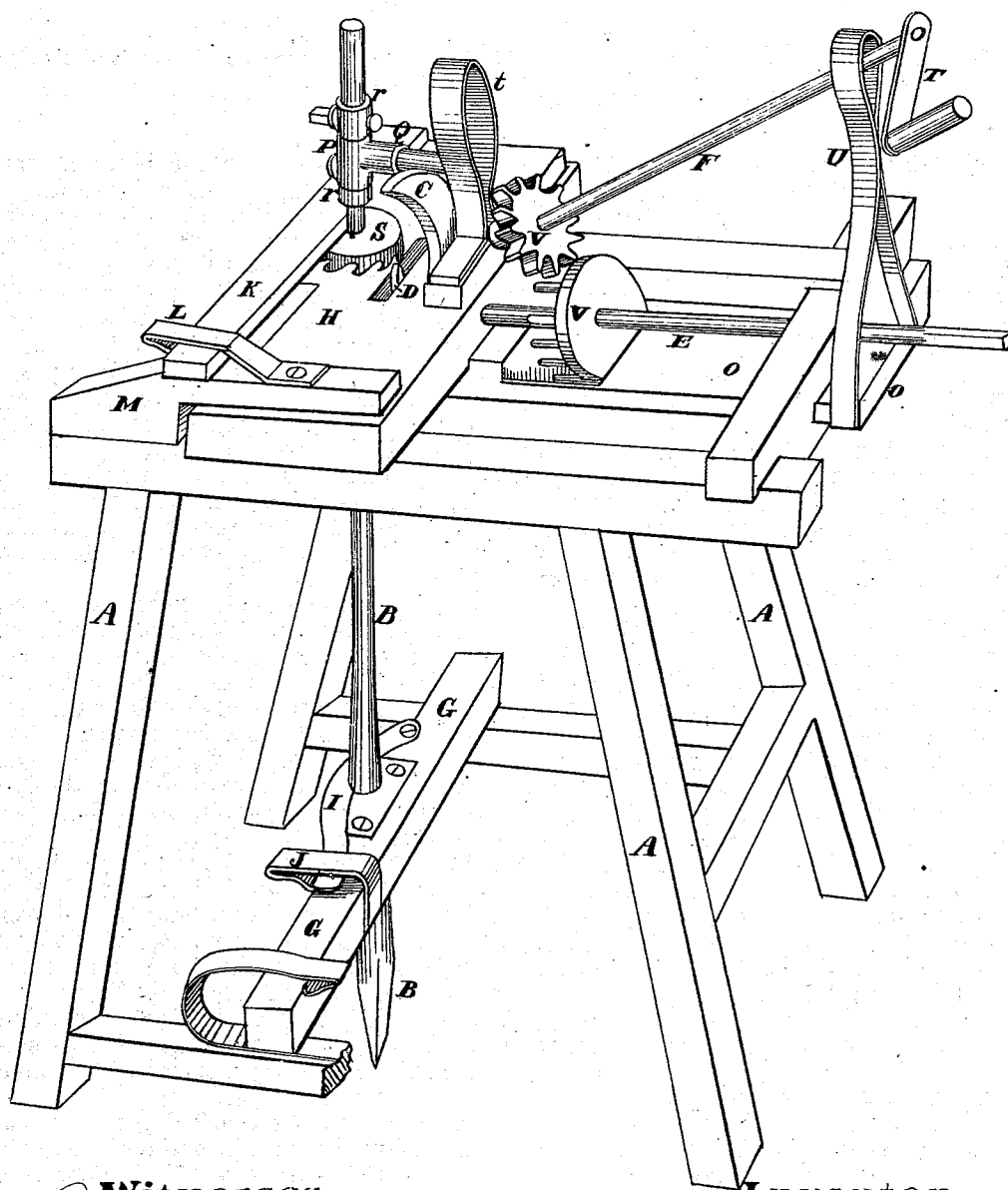


G. ATKINSON.
Rock-Drilling Machine.

No. 159,376.

Patented Feb. 2, 1875.



Witnesses
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W. H. Richardson

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UNITED STATES PATENT OFFICE.

GEORGE ATKINSON, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN ROCK-DRILLING MACHINES.

Specification forming part of Letters Patent No. **159,376**, dated February 2, 1875; application filed November 10, 1874.

To all whom it may concern:

Be it known that I, GEORGE ATKINSON, of San Francisco city and county, State of California, have invented an Improved Drill; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

My invention relates to an improvement in drills for perforating rocks or other material; and it consists in a novel method of operating and rotating the drill, and in the manner of constructing the parts of the frame and mechanism, so that they can be easily taken apart, or portions detached at will.

Referring to the accompanying drawing for a more complete explanation of my invention, a perspective view of my drill and mechanism will be seen.

My device, which I call a churn-drill, consists of a supporting-frame, A, for the mechanism, which is made strong and light, and carries the drill B, the operating-cams C and D, the driving-shaft E, and supplementary shaft F. The drill B stands vertically in the present case, and passes in front of the movable cross-beams G and H. A lever-arm, I, curves around in front of the drill, one end being pivoted to the timber G, while the other end is held by a spring-catch, J. The timber G is also retained in position in the same manner. At the top a cross-lever, K, similar to I steadies the upper end of the drill, and is held and released in the same manner by a catch, L. The pivoted end of this lever on one side, and the catch upon the other of the frame A, are mounted upon blocks M, which are also mounted upon the frame, so that they can be turned to one side, and by this means the drill and its supports can be removed, so that access can be had to the drill-hole without moving the frame. The driving mechanism of the drill is also mounted upon a sliding cross-beam, H, and a guide, O, which passes through the rear of the frame A, and can all be moved back some distance, so as to give additional space. The shaft E has

one bearing in a box on the beam H, while the other end is supported either upon the rear of the frame A or within a box upon the guide O. The front end of this shaft carries two cams, one, C, being of some size, and serving to lift the drill for each blow. The head of the drill has an adjustable sleeve, P, secured to it loosely by collars *r r* above and below it, and this sleeve is provided with an arm, Q, beneath which the cam C rises at each revolution, thus lifting the drill, which is then allowed to fall either by its own weight, if sufficient, or a spring or additional weight may be added to give efficiency to the blow, if desired. The end of the arm Q enters a vertical slotted guide, *t*, which prevents it from turning around.

The cam D is considerably smaller than *c*, and its office is to turn the drill at each rise for a stroke. In order to do this a plate, S, is fitted to move up and down the drill-shaft, but so as to turn the drill around with itself. This plate has a ratchet cut upon its lower surface, and the cam D engages with a tooth of this ratchet at each revolution of the driving-shaft, and this rotates the drill so as to make a smooth even hole.

When the drill is to be worked on a level, the frame A will stand firmly, so that the drill may work vertically; but if it is to work at an angle, the two front legs of the frame must be elevated, and as this would render it inconvenient to turn the crank T, by which the power is produced, I have mounted the shaft F at a considerable angle with the shaft E, the outer end being supported by a standard, U, from the guide O.

The inner end is supported upon the beam H just above the shaft E, and both shafts are provided with bevel-gears V V, which mesh together.

It will be readily seen that the crank can be changed from one shaft to the other, as convenience may suggest.

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

1. The drill B, lifting and guiding arm Q, and rotating ratchet-plate S, in combination with the cams C and D upon the shaft E, sub-

stantially as and for the purpose herein described.

2. The frame A, provided with the movable adjustable cross-beams H and G with their clamping-levers I and K, latches J and L, and guide O, substantially as and for the purpose herein described.

In witness whereof I hereunto set my hand and seal.

GEORGE ATKINSON. [L. S.]

Witnesses:

JNO. L. BOONE,

C. M. RICHARDSON.