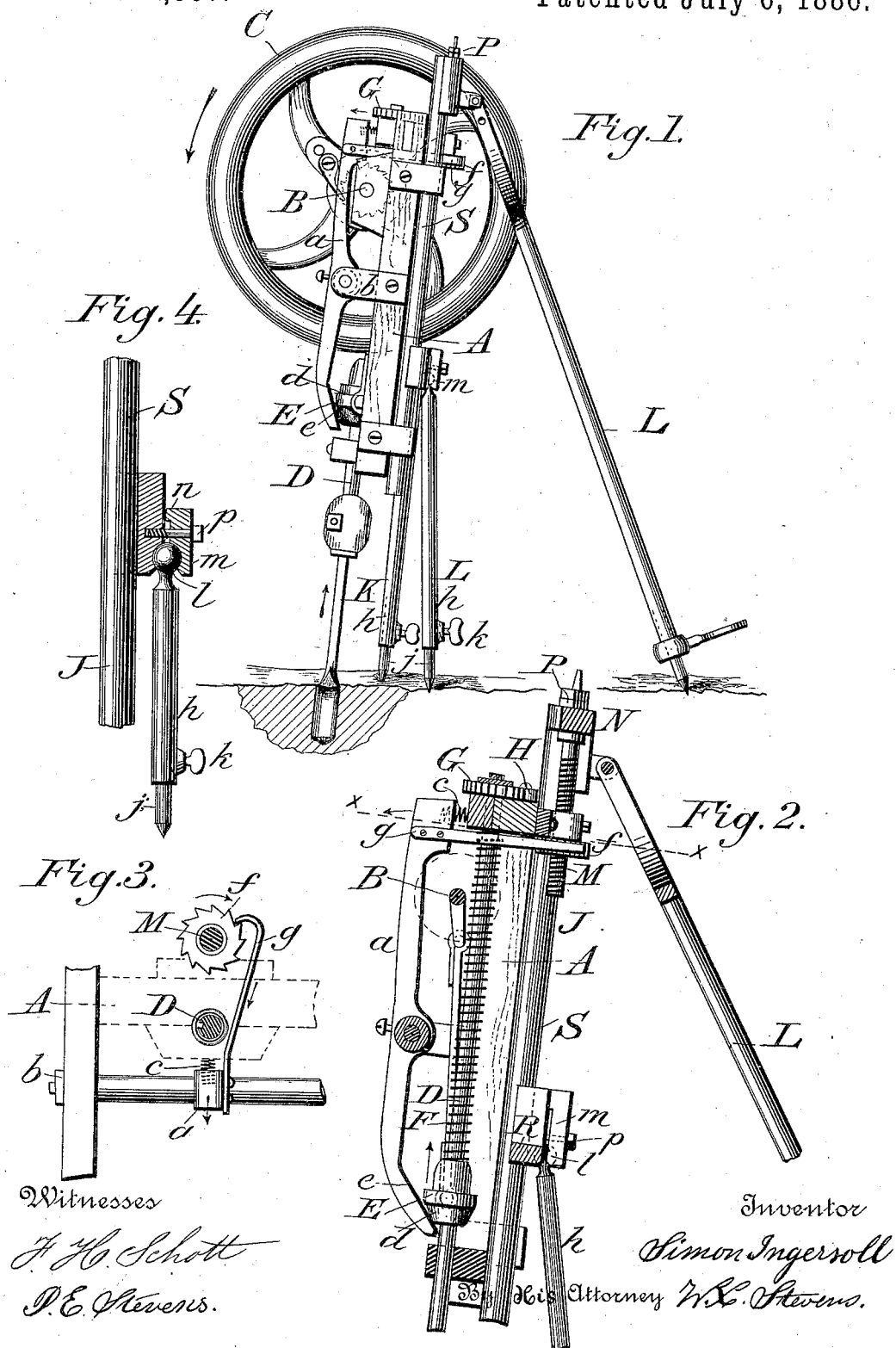


(No Model.)

S. INGERSOLL.
ROCK DRILLING MACHINE.

No. 344,907.

Patented July 6, 1886.



UNITED STATES PATENT OFFICE.

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ROCK-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 344,907, dated July 6, 1886.

Application filed March 30, 1886. Serial No. 197,153. (No model.)

To all whom it may concern:

Be it known that I, SIMON INGERSOLL, a citizen of the United States, residing at Glenbrook, town of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Rock-Drilling Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of rock-drilling machines which are adapted to bore holes into a rock by successive endwise thrusts of the drill; and it refers particularly to an improvement on the feeding device and legs shown in my former application for a patent, Serial No. 187,365, allowed March 8, 1886.

The object of my invention is, first, to provide a feeding device which will feed the drill into the rock as rapidly as the rock is cut away, whether it be hard or soft; second, to provide legs for the machine, which may be set at any point of the compass and at any required slant, to adapt the machine to stand firmly on uneven ground.

To this end my invention consists in the construction and combination of parts forming portions of a rock-drilling machine hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my rock-drilling machine. Fig. 2 is a vertical section, part in side elevation, of parts showing the feeding device. Fig. 3 is a horizontal section of the same at *x x*, and Fig. 4 is a transverse vertical section of one leg of the machine.

Those parts which are described in my former invention, above referred to, need not be particularly described herein.

A represents the frame of the machine, in which a crank-shaft, B, is journaled, to be revolved by a hand-crank wheel, C, which is connected with the said shaft B by a pawl and ratchet.

D is the drill-spindle, fitted to reciprocate vertically and to rotate in bearings in the frame A. This spindle is mounted to revolve in a cross-head, E, whose arms slide upon the frame A as guideways, and are connected with the cranks of the shaft B by means of leather

straps or similar flexible connections. The drill is raised by the cranks and straps at each revolution of the wheel, and is thrown down with great force by a spring, F, acting between the upper cross-bar of the frame and the cross-head E.

G is a ratchet-wheel mounted on the spindle D, which it engages by one or more spiral splines and grooves, and H is a pawl pivoted to the frame to engage the said ratchet.

At each throw of the drill the spindle, acting through the spiral splines and grooves by its momentum on the ratchet-wheel, turns the same forward a little, and when the drill is being raised for each throw the pawl holds the wheel from receding. Thus the drill is caused to revolve in its hole, as required, to cut away a new segment or chip of rock at every throw.

The frame A is mounted to slide vertically on another frame, S, comprising two side ways, J, and the cross-bars N and R, which frame S is supported on a tripod of legs, K L.

M is the feed-screw, journaled in the cross-bar N, and it may be secured from revolving therein by check-nuts P.

I have thus far described only that which is covered in my former patent, or which is now public property.

a is my new feed-lever, pivoted midway in arms *b* of the frame A, and provided with a push-spring, *c*, acting between the frame A and the upper end of the said lever *a*, to press the lower end of the lever constantly toward the spindle D.

d is a collar, formed as a part of or rigidly fixed to the spindle D, and it is conical or rounded on its lower side, to engage the slanting or diagonal face *e* of the lever *a*, whereby each throw of the spindle will wedge the lever out of the path of the collar *d*.

f is a ratchet-wheel, journaled in the frame A and engaging the feed-screw M by an internal thread.

g is a spring-hook, attached to the lever *a*, to act as a pawl upon the ratchet-wheel *f*. At every throw of the spindle the lever *a* will be tilted to reach the hook *g*, back to engage teeth of the ratchet *f*, and when the spindle is next raised the collar *d* gradually releases the incline of the lever, allowing the spring *c* to

steadily return the lever and pull the ratchet around on the screw M, thereby feeding the frame A downward. If the rock be hard, the drill will not penetrate to its full throw at each stroke; consequently the feed-lever will not be moved to reach its full complement of teeth on the ratchet at such times and the feed will be slow. In fact, if the rock be very hard, the drill might make a dozen throws and be completely revolved in its hole before it would actuate the feed-lever to reach a new tooth of the ratchet. Thus the feed is made automatically slow or fast, in proportion as the work being done by the drill is hard or easy.

N represents either of the side legs of the tripod, provided with a pointed telescoping foot, *j*, and set-screw *k*, whereby the foot may be fixed in the leg at any point of extension. The leg is attached to the frame S by a ball-and-socket or hip joint.

l is the ball, being a part of the leg. The socket is formed partly in the frame and partly in a cheek-piece, *m*, having a heel at *n*, to rest directly against the body, and provided with a binding-screw, *p*, which passes through the cheek-piece into the body between the socket and heel.

When the screw *p* is loosened, the leg may be turned to any point of the compass at a downward or bracing angle, to find a secure nook into which the telescoping foot may be extended, then by fixing the set-screws the leg becomes a rigid fixture to steady the machine.

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

1. The combination, in a rock-drilling machine having a stationary frame, a frame fitted to slide thereon, a feed-screw fitted to slide one frame upon the other, a drill-holding spindle, and means for reciprocating it longitudinally in the said sliding frame, of a collar, conical or rounded on its lower side, fixed to the said spindle, a feed-lever pivoted midway to the sliding frame and slanted at its lower end diagonally into the path of the said spin-

dle-collar, a screw-nut upon the aforesaid feed-screw, journaled in the sliding frame and shaped circumferentially as a ratchet-wheel, a hook-shaped pawl connecting the upper end of the said feed-lever with the ratchet-wheel, and a spring impelling the lower end of the feed-lever toward the spindle, substantially as shown and described.

2. The combination, in a rock-drilling machine, of a sliding frame, a drill-spindle fitted to reciprocate longitudinally therein and provided with a collar tapering or rounded on its lower side, a feed-lever pivoted to the frame and provided with a slanting end fitted to pass diagonally into the path of the said spindle-collar, connecting mechanism, substantially as described, at the upper end of said lever, and a spring impelling the lever constantly toward the said path, substantially as shown and described.

3. The combination, in a rock-drilling machine, of a frame fitted to slide, a feeding device therefor, a lever to operate the feeding device, and a drill-spindle fitted to reciprocate longitudinally a given distance in the frame, the said spindle being provided with a collar tapering or rounded on its lower side, and the said lever having one end slanted diagonally into the path of the said collar near the lower end of the said path, substantially as shown and described.

4. The combination, in a rock-drilling machine, of legs having balls at their upper ends, a frame having partial sockets for the said balls near its lower corners, cheek-pieces, each shaped with a heel at one end to rest on the said frame and a partial socket near the other end, and a binding-screw fitted through each cheek-piece into the frame between the heel and the socket, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

SIMON INGERSOLL. [L. S.]

Witnesses:

JOHN E. MARSHALL, [L. S.]
ANDREW BURNS. [L. S.]