(No Model.)

E. MOREAU.

HAND ROCK DRILL.

No. 269,952. Patented Jan. 2, 1883.

Fig. 1

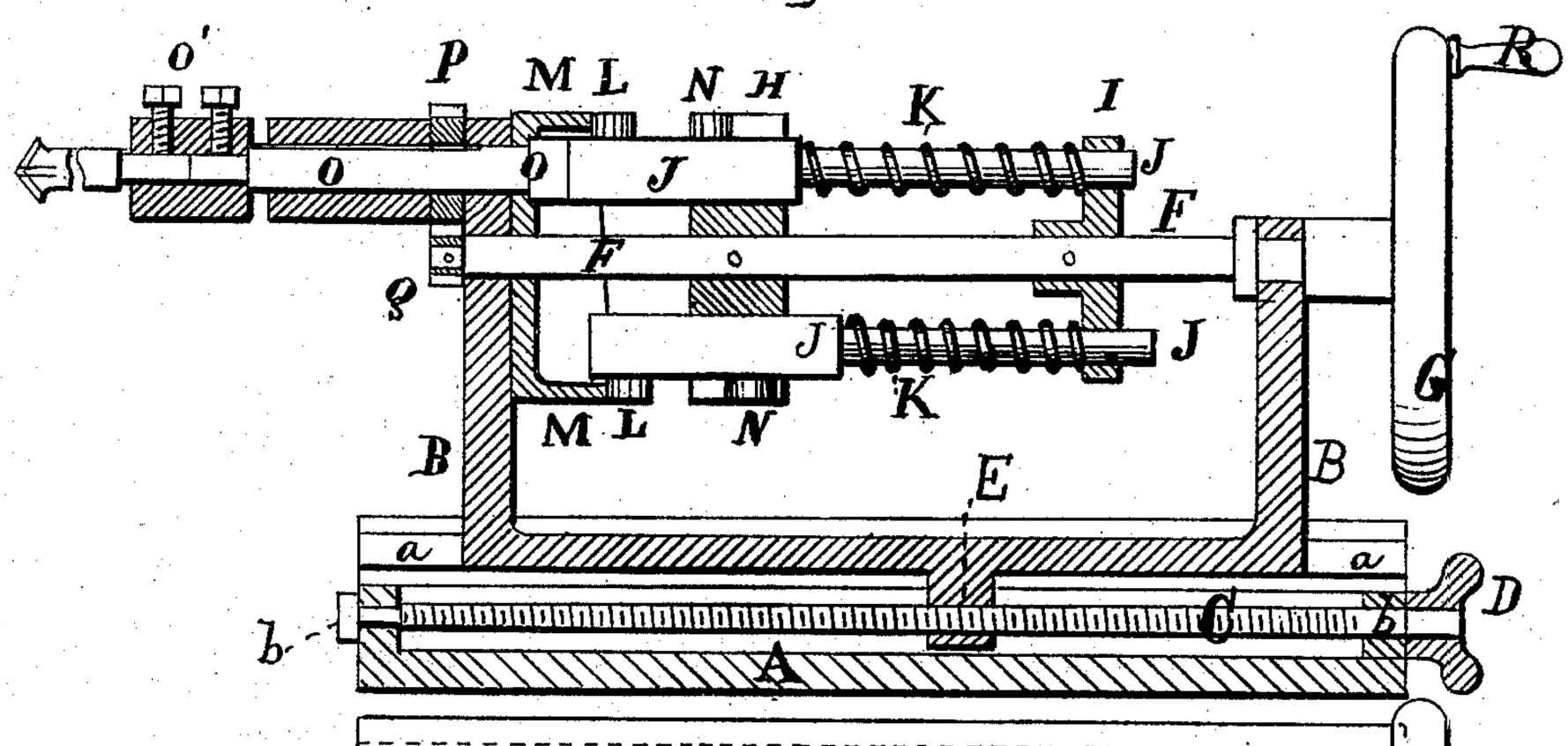


Fig. 2

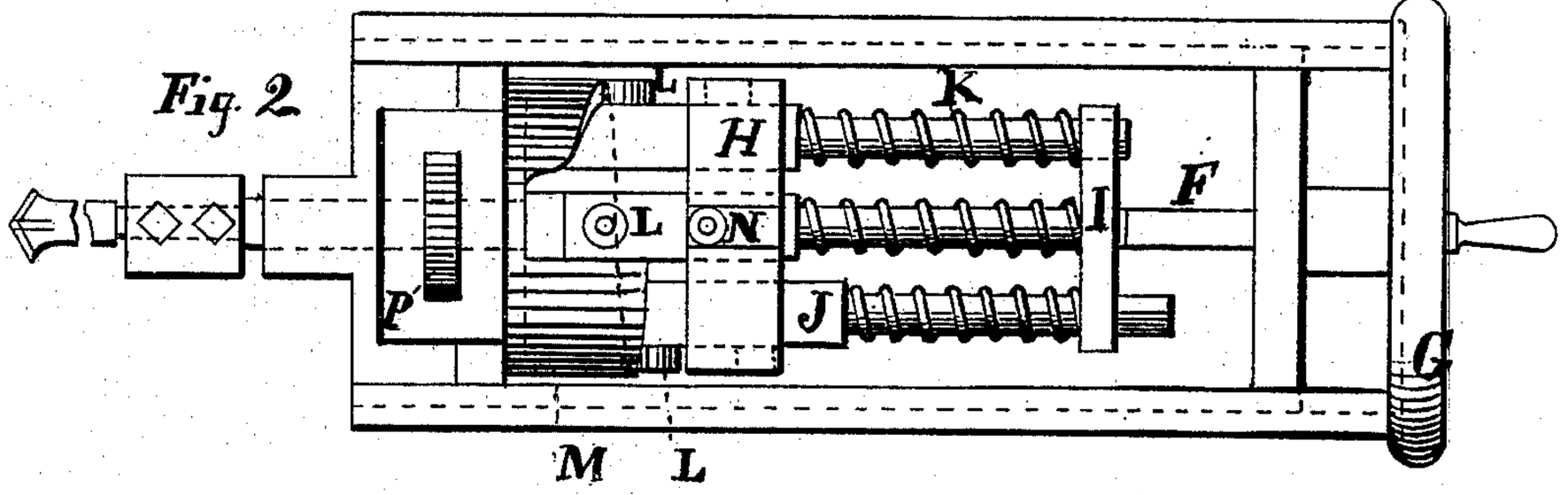


Fig. 3

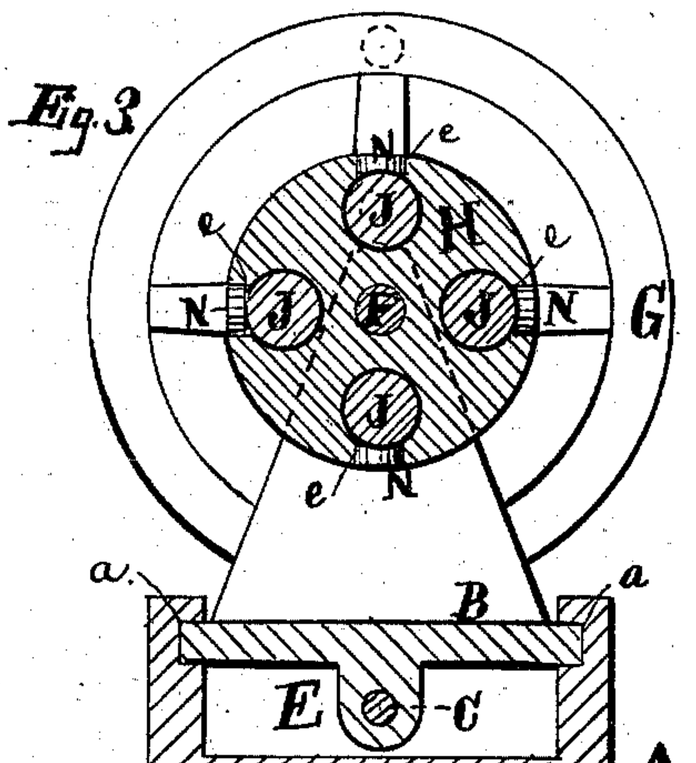
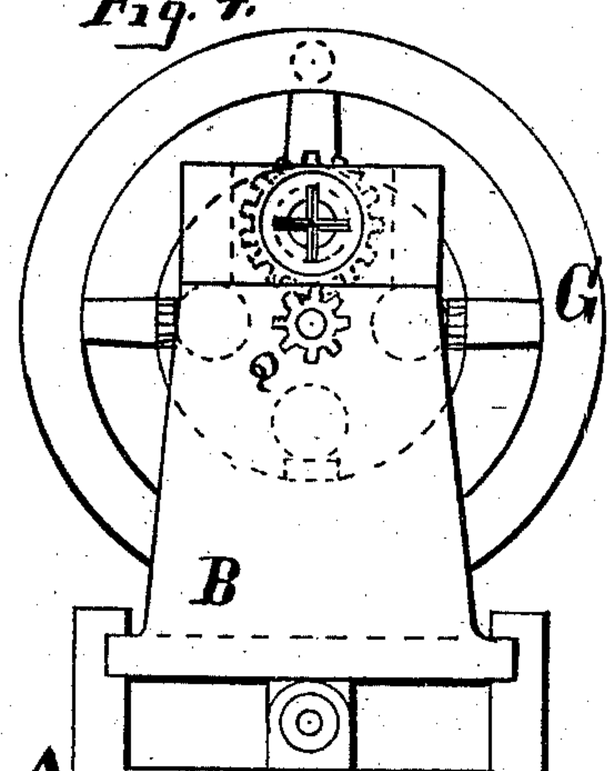


Fig. 4.



Witnesses

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Frank A. Brooks

Inventor

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UNITED STATES PATENT OFFICE.

EUGÈNE MOREAU, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THEODORE W. STERLING, OF SAME PLACE.

HAND ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 269,952, dated January 2, 1883.

Application filed January 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, EUGÈNE MOREAU, of the city and county of San Francisco, State of California, have invented an Improvement in Hand Rock-Drills; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to improvements in hand rock-drills; and it consists in the combination and arrangement of parts, substantially as hereinafter more fully set forth and claimed.

Referring to the accompanying drawings, Figure 1 is a side elevation and section of the machine. Fig. 2 is a top view of same. Fig. 3 is a cross-section, and Fig. 4 is a front elevation.

A is a bed-plate, in which are cut the longitudinal grooves *a a*.

B is the frame of the machine, and slides in the grooves *a a*.

The screw C, provided with the hand-wheel D, turns freely in the bearings *b b* at the ends of plate A. The screw C passes through the nut E, cast on the frame B, so that by turning the hand-wheel D the machine is made to go forward or back in the guides or grooves *a*, as desired.

A shaft, F, rests in the bearings made for it at the ends of the frame B. On the shaft F is fastened the crank-wheel G and the two disks H and I. The disk H is provided with holes equidistant from each other and also from axis of shaft F, Fig. 3. Grooves *e* are cut opposite each hole at the periphery of disk H. Holes are also drilled into the disk I, corresponding in position to those of disk H, but of a smaller diameter.

J are steel pieces, made to fit the holes in the disks H I. The part fitted in H is called the "hammer" and the part fitted in I is called the "stem." Spiral springs K are placed on the stems between the shoulder of the hammer and the disk I to press the hammer toward the front of the machine. On each hammer are fitted two friction-rollers, one of which, L, bears against the cam M and the other, N, fits into the grooves *e* at the periphery of the disk H, thus allowing the hammer to move backward and forward, but preventing its rotation on its own axis. The cam M is a cylinder, (the shaft F passing through its center,) and is fastened to the inner side of the front end of frame B. Its edge, against which the rollers L are pressed, is cut in the shape of a screw, so that when a movement of rotation is imparted to the shaft F and the hammers each hammer will be pressed back until it has come opposite the upper part of the machine, when it is relieved from the cam, which allows it to go suddenly forward under the action of the spring K, and strike the spindle O. The spindle O is fitted into a bearing made to receive it at the front part of the machine. The inner end of O is of larger diameter than the body, and at the other end is fitted a block, O′, made to receive and hold the drill.

P is a gear fitted loosely through a recess in the frame upon the spindle O, said spindle O being provided with a spline, in which fits a corresponding feather riveted to gear P, thus providing for the forward and backward movement of the spindle while still causing it to revolve with said gear.

At the forward end of shaft F is keyed a pinion, Q, engaging the gear P. The pinion Q and gear P may preferably have their numbers of teeth in proportion of one to two.

When the shaft F is made to revolve by means of crank R of wheel G the hammer J, passing through, the disks H I upon said shaft are revolved and are pressed back against the springs K by the cam M, against which their rollers L impinge, so that each one in its turn will come opposite and strike the spindle O. At the same time the pinion Q causes the gear P, and consequently the spindle O, to revolve. This causes the rotation of the drill. By this construction I obtain a steady rotation, combined with the blows upon the drill, and thus keep the point constantly cutting into the rock. A high rate of speed may be obtained, as the hammers may be brought into position rapidly and the blows delivered upon the continuously-revolving drill. When the point of the drill is made to bear against the rock the combined effect of the blows and the rotation of the drill causes the latter to perforate the rock. The point of the drill is kept

in contact with the rock as it progresses by means of the hand-wheel D, screw C, and nut E, the bed-plate A having been previously placed and fastened in its proper position.

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

1. In a hand rock-drill having a frame, B, and a drill and drill-holding spindle O, the combination and arrangement of the series of hammers J with their rollers L N and operating-springs K, the disks H I, driving-shaft F, with its crank-wheel G, and cam M, substantially as and for the purpose herein described.

2. The bed-plate A, frame B, adjustable thereon by means of screw C and nut E, hammers J, rollers L N on the shafts of said hammers, springs K, disks H I, carrying the hammers, shaft F and wheel G, drill-holding spindle, with its drill, the feathered gear P, pinion Q, and the cam M, operating to retract the hammers, all in combination, substantially as and for the purpose set forth.

3. In a hand rock-drill, the drill-holding spindle O, in combination with the revolving power-shaft F, a series of parallel hammers connected with and revolved by said shaft to bring each hammer successively in line with the drill-holding spindles, a mechanism for discharging each hammer thereon when in line, and a mechanism connected with the power-shaft F, and the drill-holding spindle for imparting a continuous revolution to said drill-holding spindle, substantially as and for the purpose herein described.

4. In a hand rock-drill, the drill-holding spindle O, and the means for imparting continuous revolution to it, consisting of the feathered ratchet P, pinion Q, and power-shaft F, in combination with the series of parallel hammers J, connected with and revolved by the power-shaft F, and a mechanism for discharging each hammer as it is brought in line with the drill-holding spindle, all arranged and operating substantially as herein set forth.

In witness whereof I hereunto set my hand.

EUGÈNE MOREAU.

Witnesses:

FRANK A. BROOKS,

S. H. NOURSE.