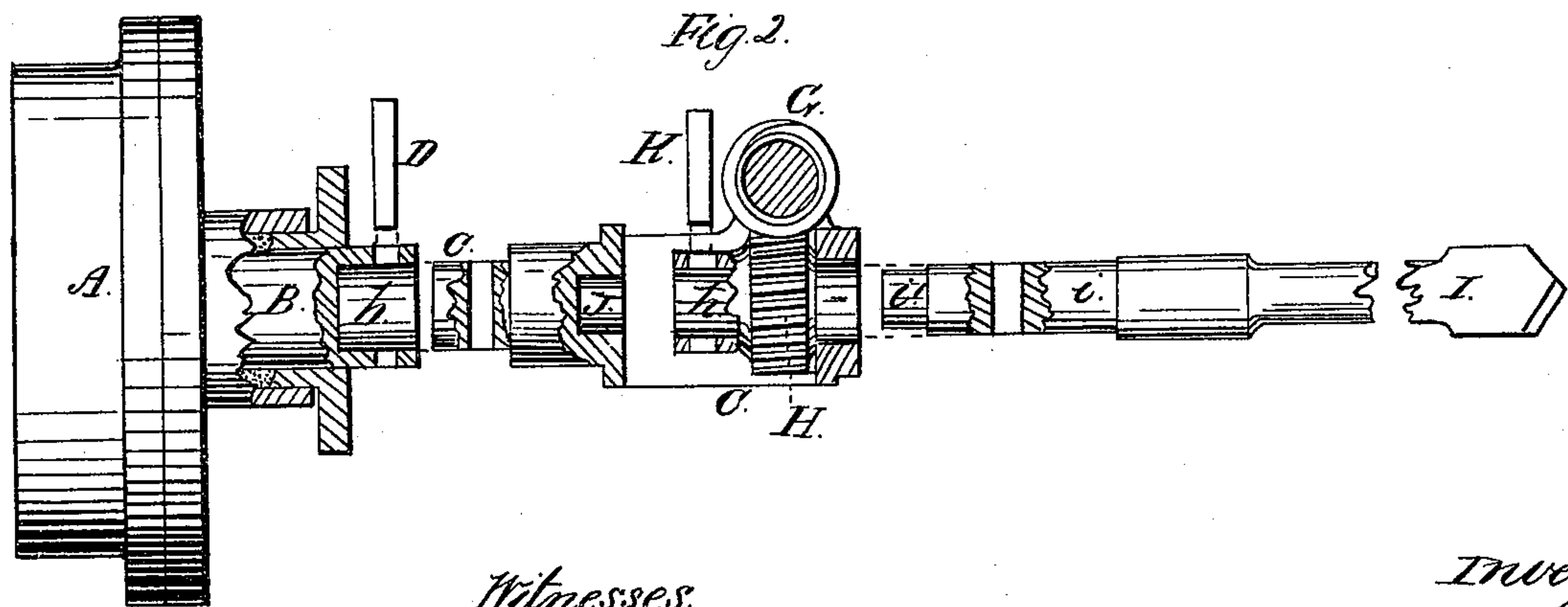
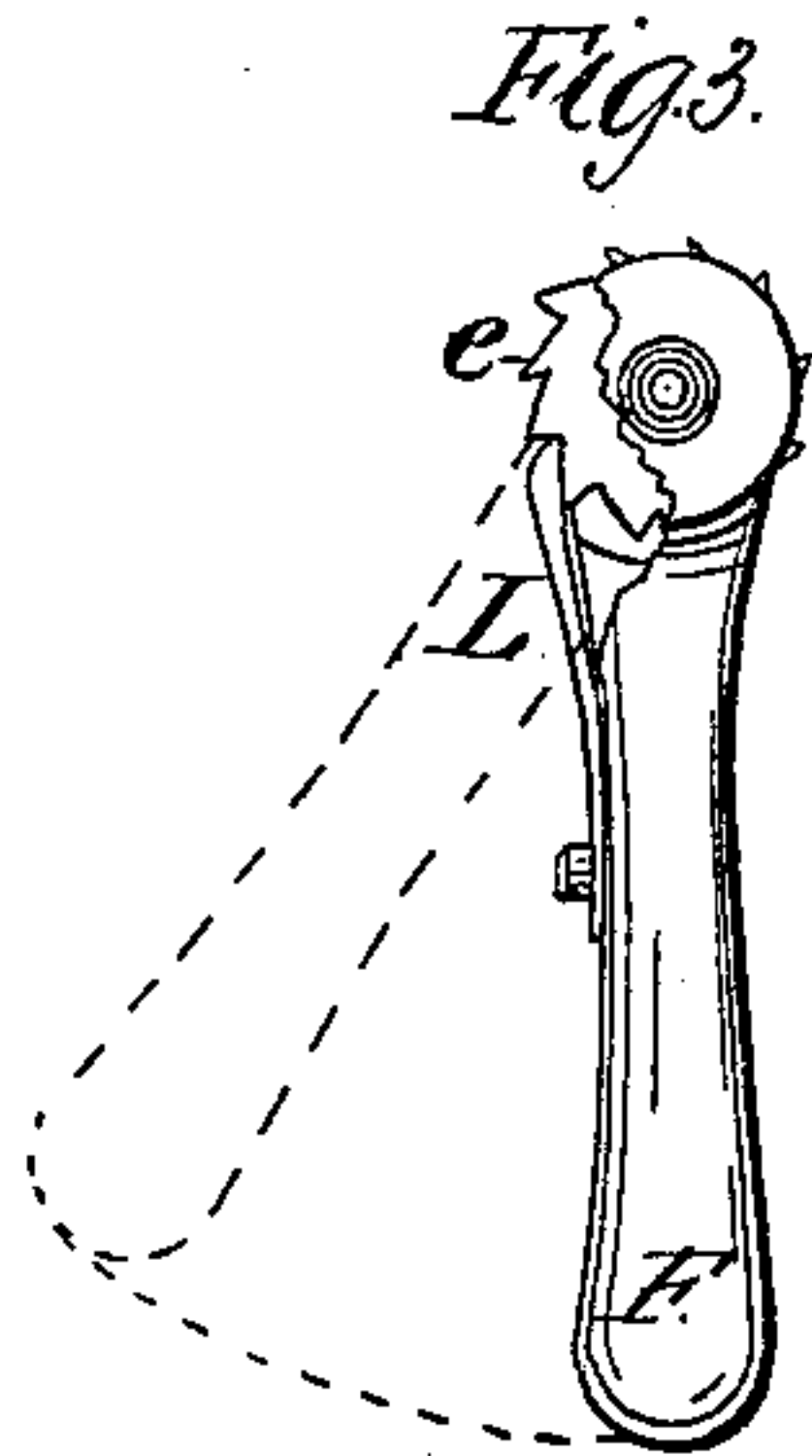
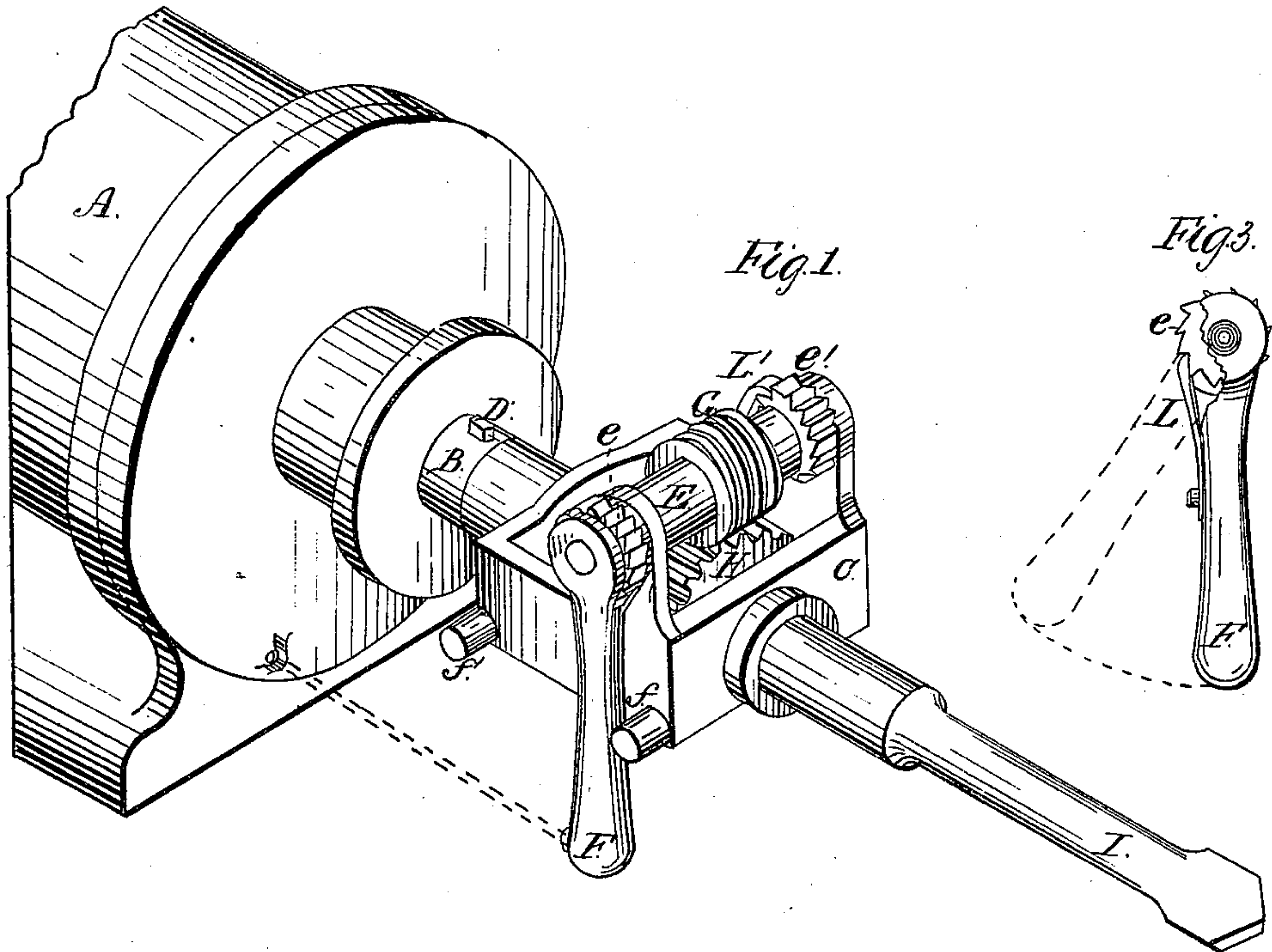


R. C. M. Lovell.
Rock and Coal Drill.

N^o 86,988.

Patented Feb. 16, 1869.



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RICHARD C. M. LOVELL, OF COVINGTON, KENTUCKY.

Letters Patent No. 86,988, dated February 16, 1869.

IMPROVED ROCK-DRILL.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, RICHARD C. M. LOVELL, of Covington, Kenton county, Kentucky, have invented a certain new and useful Improvement in Rock and Coal-Drills; and do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

This invention relates to that class of mechanical appliances which are employed in various kinds of drilling-operations for mining-purposes; and

My improvement consists in automatically rotating the chisel, before each and every blow, by means of a swinging or vibrating pendant, and a worm and worm-wheel, which are attached to a frame that carries the chisel, said operating-pendant being actuated by the momentum of the piston-rod, frame, chisel, and their accompanying devices, which devices will be hereafter fully described.

In the accompanying drawings—

Figure 1 is a perspective view of a drill embodying my improvements, and

Figure 2 is a longitudinal section of the apparatus, with the different parts detached.

Figure 3 is a side elevation of the operating-pendant and its accompanying ratchet.

A represents the cylinder of an engine, which may be operated by steam, compressed air, or other suitable power; and this cylinder is provided with a piston-rod, B, which carries a frame, C.

The frame C has a stem, c, which is adapted to enter a socket, b, in the outer end of the piston-rod; and these two members are connected by the removable key D.

Journalled in the frame C is a shaft, E, to one end of which is connected the swinging pendant F, whose vibration is limited, in either direction, by the stops f f'.

The shaft E also carries two ratchet-wheels, e e', and a worm, G, the latter of which gears with a worm-wheel, H, having an axial perforation, h, for the reception of the shank i of the chisel I.

In order to relieve the worm-wheel H from the shock caused by the chisel striking the rock, I provide the inner end of the chisel with a short stem, i', that is seated in the socket J of the frame.

The chisel is united to the worm-wheel by a key, K.

L is a pawl upon the pendant F, for the purpose of operating the ratchet-wheel e, and a similar pawl, L', upon the frame, prevents the worm G being rotated in the wrong direction.

The operation of my coal or rock-drill is as follows:

On the out-door or effective stroke of the piston, the free end of the pendant F has a tendency, on account of its weight and consequent inertia, to remain motionless; but, as the upper end of it is carried forward by the movement of the frame C, its lower end drags behind, and swings toward the cylinder of the engine, as shown by the dotted red lines in fig. 3.

This backward swing or vibration of the pendant, which is limited by stop f', causes the pawl L to operate the ratchet-wheel e, by which means the chisel I

is rotated, through the medium of the wheel H and worm G.

As soon as the in-door or return-stroke of the piston commences, the pendant swings forward, and strikes the outer stop, f, without acting upon the ratchet.

From the above description, it will be seen that the chisel is automatically rotated at every outward stroke of the piston, and the amount of rotation which is imparted to the chisel can be regulated by the gearing G H, so as to adapt the drill to different kinds of mining-operations.

The worm G and wheel H not only rotate the drill, but they also serve to hold the latter in position, and prevent its turning in its bearing, in case the point of the chisel should come in contact with some hard substance.

It is evident that the arrangement of parts here described may be altered, without affecting the principle of the invention; as, for example, the pendant F may be arranged to vibrate above the shaft E, instead of below it; or a weight may be secured to a horizontal shaft, so as to reciprocate in suitable bearings on the frame C, the weight being provided with a pawl, for the purpose of operating the ratchet e.

It will be seen, by referring to fig. 2, that all of the operative parts of my drilling-apparatus can be detached in a moment's time, and new ones applied, in case any of them should become broken, or otherwise injured.

In drilling very hard rocks, it may sometimes be necessary to give the chisel such a short and slow stroke that the momentum would not be sufficient to operate the swinging pendant, in which case a positive movement should be imparted to it by connecting its lower end to one end of a rod, which could be attached to the engine, or other fixed object, as shown by dotted red lines in fig. 1.

Before making this connection with the engine, the ratchet-wheel e should be reversed, in order that the pawl L may operate said pendant on the in-door instead of the out-door stroke of the piston, so as to prevent the rotation of the chisel while it is in contact with the rock.

Mechanical equivalents of the devices for rotating the chisel may manifestly be substituted for them, without changing the invention.

I claim herein as new, and of my invention—

1. The chisel I of a drilling-machine, rotated by means of the vibrating pendant F, ratchet-arrangement L e, worm G, and worm-wheel H, substantially as set forth.

2. The combination, substantially as described, of the piston B b, key D, frame C c, worm-wheel H h, chisel I i i', socket J, and key K, for the purpose of permitting the ready attachment and detachment of the various parts of the device, as herein specified.

In testimony of which invention, I hereunto set my hand.

Witnesses: RICHARD C. M. LOVELL.
GEO. H. KNIGHT,
JAMES H. LAYMAN.