No. 748,712. PATENTED JAN. 5, 1904.

A. FAUCK.

ROCK DRILLING MACHINE.

APPLICATION FILED MAR. 24, 1903.

NO MODEL.

Fig. 2.

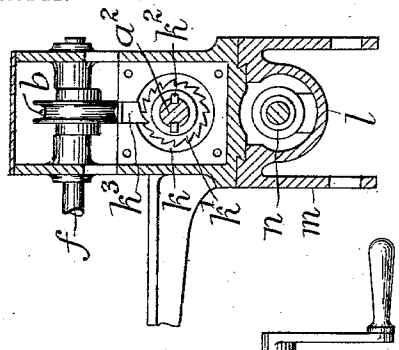


Fig. 4.

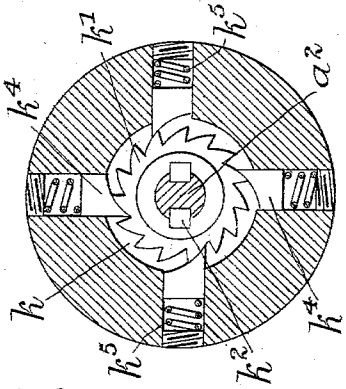


Fig. 1.

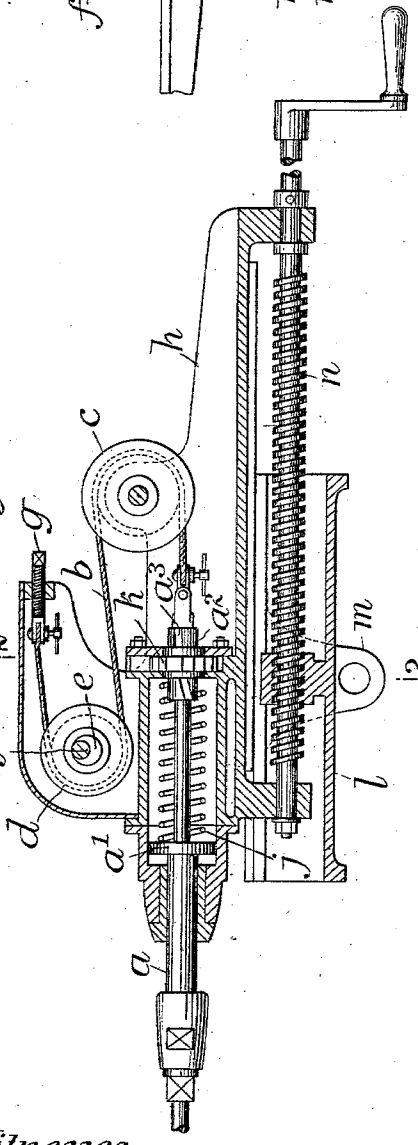
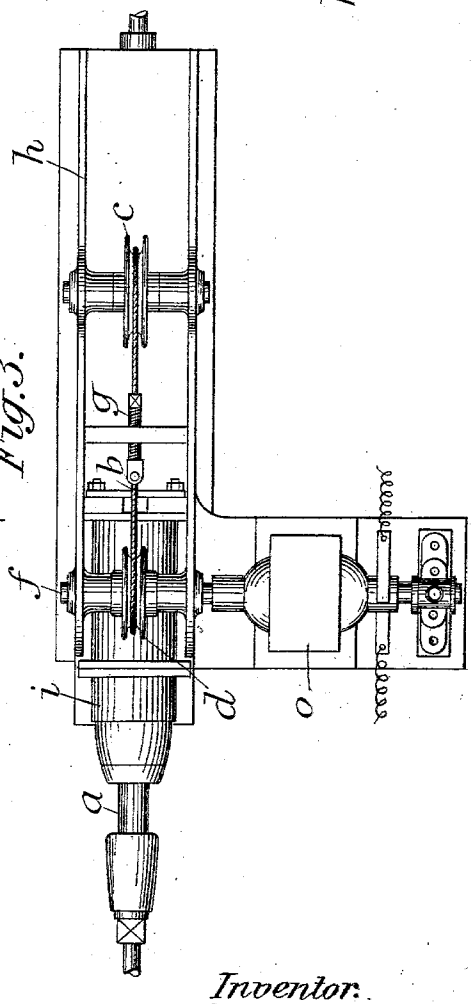


Fig. 3.



Witnesses,
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per A. B. Willson,
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No. 748,712. Patented January 5, 1904.

UNITED STATES PATENT OFFICE.

ALBERT FAUCK, OF VIENNA, AUSTRIA-HUNGARY.

ROCK-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 748,712, dated January 5, 1904.

Application filed March 24, 1903. Serial No. 149,395. (No model.)

To all whom it may concern:

Be it known that I, ALBERT FAUCK, a citizen of the United States, residing at Vienna, in the Province of Lower Austria and Empire of Austria-Hungary, have invented a new and useful Improvement in Rock-Drilling Machines, of which the following is a specification.

My invention relates to that class of percussion rock-drilling machines in which the drill-bar is moved back by gearing connecting it with a revolving shaft, while the active stroke of the said bar is effected by an actuating-spring compressed by the back stroke of the drill-bar. The highest working velocity of the known rock-drilling machine of this class is six hundred strokes per minute, as the mechanisms hitherto used for transmitting movement from the driving-shaft to the drill-bar did not admit of higher velocities.

Now my invention has for its object to replace, in rock-drilling machines of the class referred to, the mechanisms hitherto used for withdrawing the drill-bar by a mechanism which affords possibility for such a considerable increase of velocity that the armature of a driving-electromotor may be directly mounted upon the driving-shaft of the drilling-machine.

According to my invention I connect the rear end of the drill-bar with a rope, which thence runs round a loose pulley mounted upon an eccentric of the driving-shaft to a fixed point. With this mechanism velocities of two thousand strokes per minute can be reached.

In the annexed sheet of drawings, Figure 1 is a sectional elevation of a rock-drilling machine embodying the invention. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a top view of the machine. Fig. 4 is a sectional elevation, drawn to a larger scale, of the ratchet-and-pawl drill-rotating mechanism I prefer for use in machines destined to be run very quickly.

Referring to Fig. 1, the drill-bar a has secured to its rear end a rope b, running round a guide-pulley c and thence round a roller or pulley d, which is loosely mounted upon an eccentric e, secured to the driving-shaft f. From the said roller d the rope is led to a screw g, screwed into a screw-threaded hole of the machine-frame h and enabling the rope b to be tightened.

The drill-bar a is guided in holes of the heads of a cylindric box i, containing the actuating-spring j, the front end of which bears against the collar a' of the bar, while its rear end bears against the rear head or bottom of the cylinder i. Outside the said bottom there is formed a chamber k, containing the usual ratchet-wheel k' for partly revolving the drill at each stroke. The thickened portion a^2 of the drill-bar a is provided with two helical grooves a^3, and the ratchet wheel k' has inserted into its nave two splines k^2 k^2, working in the said helical grooves, while a pawl k^3, loosely inserted into a passage of the top side of the chamber k, engages the ratchet-wheel k' under the action of gravity. While the bar a moves forward, the grooves a^3, sliding along the splines k^2, cause the ratchet-wheel k' to revolve, so as to push the pawl k^3 upward, and during the back stroke of the bar a the said pawl holds the ratchet-wheel k' against rotation, and thereby causes the bar a to turn a certain angle.

As the stroke of the drill must be the shorter the quicker the machine is run, I avoid small teeth in the ratchet-wheel by using four pawls, as shown in Fig. 4. Each of these pawls k^4 is inserted into a passage closed by a screw-plug and has a spring k^5 pressing on it. At each front stroke the ratchet-wheel k' revolves only one-fourth of the breadth of a tooth, and the pawls are so arranged that they slide off a tooth *seriatum*, one of them at each stroke.

The base-plate of the machine-frame h is adapted to slide upon a support l, having two-holed cheeks m, through which to pass a cross-beam, by means of which the machine may be braced in the tunnel. By means of the screw n the machine can be advanced in the rate as the work progresses.

In Fig. 3 an electromotor is shown at o, having its armature mounted upon the driving-shaft f. When the shaft f revolves and the eccentric e moves from it rearmost to its foremost position, the rope portions between c and d, on the one hand, and between d and g, on the other hand, are lengthened the same rate, and consequently the drill-bar a is

drawn backward twice the length of the eccentricity. During the following half-revolution of the eccentric *e* the rope *b* is slackened before the spring *j* has imparted to the drill a corresponding velocity, and consequently the drill is enabled to strike with great velocity and with its full momentum.

It is obvious that this rock-drilling machine may be adapted for being operated by hand by fastening a small cog-wheel to the driving-shaft *f* and loosely mounting upon a trunnion of the guide-pulley *c* a corresponding large cog-wheel provided with a crank-handle.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

A rock-drilling machine having a support, a carriage movable longitudinally thereon, means to move the carriage, a reciprocatory drill-bar, a driving-shaft and a pulley carried by the carriage, a spring to move the drill-bar in one direction, an eccentric on the driving-shaft, a cord having its ends connected respectively to the carriage and drill-bar and having oppositely-extended bights engaging the pulley and eccentric, and a motor to drive the shaft and carried by the carriage, substantially as described.

In witness whereof I have signed this specification in presence of two witnesses.

ALBERT FAUCK.

Witnesses:
VICTOR KERPL,
ALVESTO S. HOGUE.