(No Model.) 2 Sheets—Sheet 1.

A. E. BUZZO.

MINING DRILL.

No. 528,850. Patented Nov. 6, 1894.

FIG. 1.

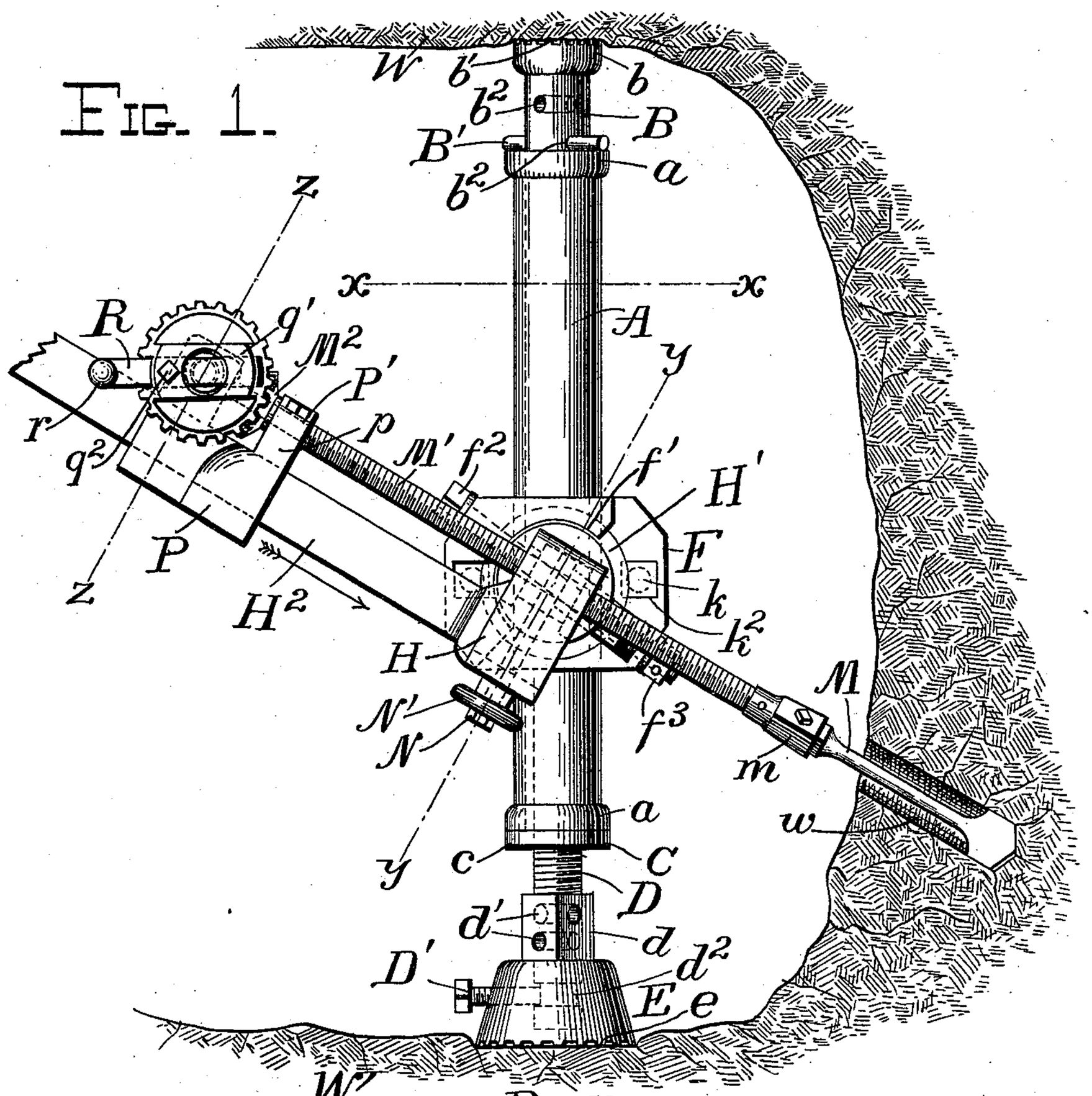

FIG. 2.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

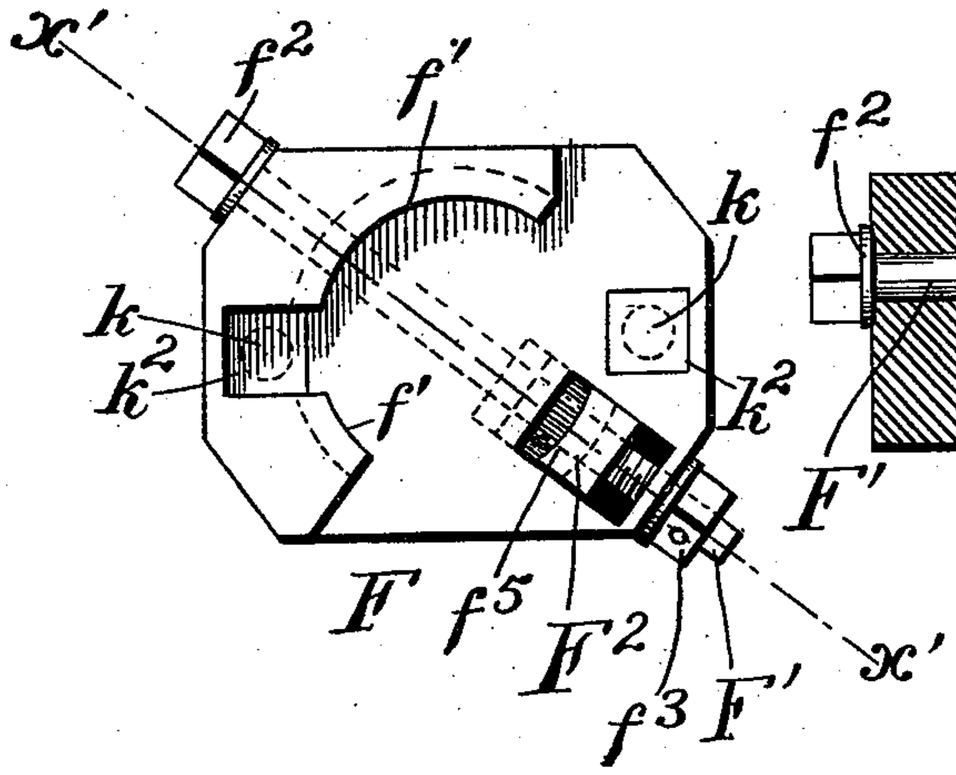
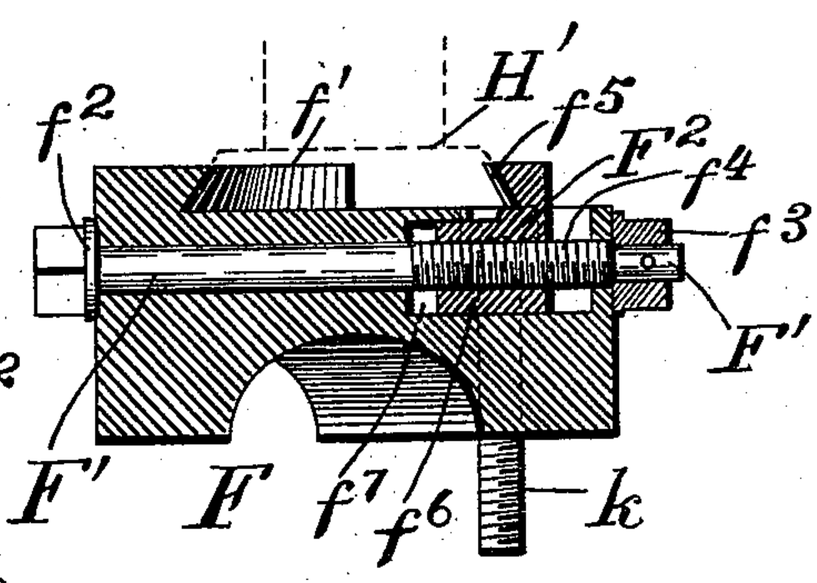


FIG. 4.



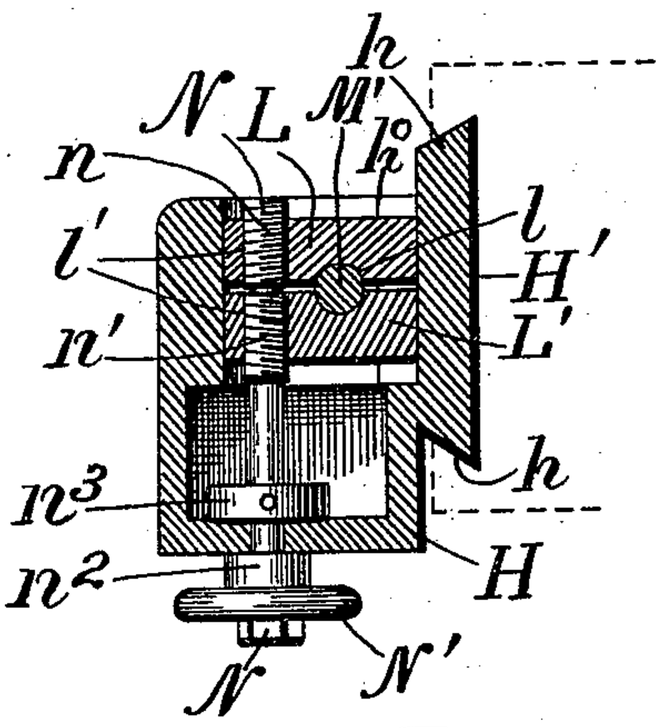


FIG. 5.

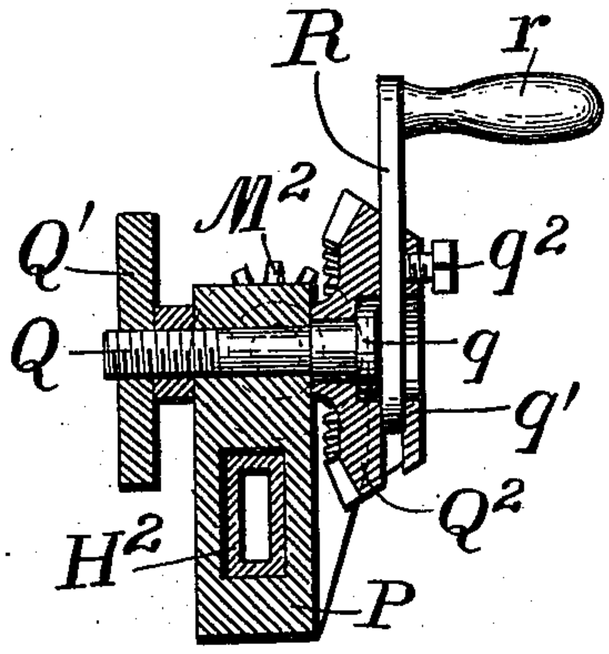


FIG. 6.

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UNITED STATES PATENT OFFICE.

ARTHUR E. BUZZO, OF ISHPEMING, MICHIGAN.

MINING-DRILL.

SPECIFICATION forming part of Letters Patent No. 528,850, dated November 6, 1894.

Application filed April 6, 1894. Serial No. 506,614. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR E. BUZZO, a citizen of the United States, residing at Ishpeming, in the county of Marquette and State of Michigan, have invented certain new and useful Improvements in Mining-Drills; 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.

My invention relates to improvements in rock drills or boring machines, and it consists of certain novel features hereinafter described and claimed.

Reference is to be had to the accompanying drawings in which the same letters indicate the same parts throughout the several views.

Figure 1 represents a sectional view of the end of a heading in a mine and illustrates the operation of the rock drill therein. Fig. 2 represents a section of the device shown in Fig. 1 along the line *x x* of the said figure and looking down. Fig. 3 represents a view of the face of the block for carrying the drill frame and the mechanism mounted therein. Fig. 4 represents a section of the device shown in Fig. 3, along the line *x' x'* of the said figure. Fig. 5 represents a section of the device shown in Fig. 1, along the line *y y* of the said figure, and Fig. 6 represents a section of the device shown in Fig. 1 along the line *z z* of the said figure.

A represents a stout metal tube with flanges *a* at the ends thereof to strengthen the same. In one end of this tube A a smaller tube B is inserted to a depth regulated by the cross bar B' passing through one of a series of holes b^2 in the tube B and resting on the upper flange *a* of the tube A.

The tube B has its upper end strengthened by means of a flange *b* which is dentated or roughened on its upper surface to hold better in the rock or other material in the mine.

The lower end of the tube A incloses a tube or sleeve C held fast in said tube A, and, cut with a female screwthread to engage the adjusting screw D of the jack. This screw is provided near its lower end with an angular head *d* to engage in a wrench, and this head may be perforated with holes *d'* for the insertion of "capstan bars" for turning the said screw. The base of this head *d* rests on the top of the supporting block E. The lower end of the screw D is turned down plain and is provided with an annular groove d^2, as shown in dotted lines in Fig. 1, in which the end of the holding screw D' enters, and thus prevents the screw D from being drawn out of the block E. This block is also dentated or roughened on its lower side as at *e* to hold better in the rock or other material in the mine.

Mounted on the tube A is the sliding block F. This block is cut away as at *f* to receive the tube A and is clamped at any desired position on the said tube by means of the cap square K and the bolts *k* and nuts *k'*. The heads k^2 of these bolts *k* are let into the front face of the block F, so as to be flush therewith and thus to be clear of the holding plate of the drill frame. The front face of this block F is provided with overhanging arc-shaped jaws *f'* which form a semi-circle cut away in the portion to admit the countersunk head k^2 of one of the bolts *k*. The bolt F' is diagonally mounted in the block F. This bolt has nuts or head f^2 and f^3 fast at either end thereof preferably made angular to be turned by a wrench, which nuts prevent the longitudinal play of the bolt in its bearings but allow it to revolve freely therein. The part f^4 of the bolt F' is screwthreaded and engages in a female screw in the base f^6 of the sliding block F^2. This base f^6 moves in suitable guides in the block F, while the upper portion of the block F^2 is provided with an overhanging jaw f^5 similar to the jaws *f'*. These jaws *f'* and f^5 are constructed to engage the conical edges *h* of the pivot plate *h'* of the drill frame H, and the said plate is firmly but revolubly secured within the said jaws by a simple revolution of the bolt F' which causes the jaw f^5 to approach the jaws *f'*.

The drill frame H is secured to the block F by means of the conical pivot plate H' already described, and carries the drill and the mechanism for operating the same.

The bit M is secured in the chuck *m* at the end of the screw M' which screw passes between the blocks L and L' each cut with a portion of a female screw thread *l* adapted to engage the male screw thread of the screw M'. These blocks L and L' fit in an angular cham-

ber h° in the frame H and are moved together and apart by means of the screwthreads l' which engage in the right and left handed screwthreads n and n' on the spindle N. This spindle is revolubly mounted in the frame H, but is prevented by the set collars n^2 and n^3 from sliding longitudinally in said frame.

N′ represents a hand wheel for turning the spindle N.

It will be evident that if the blocks L and L′ be moved toward each other they will engage the screw M′, while if moved in the opposite direction they will be thrown out of engagement with the said screw.

The frame H projects to the rear in the form of a rectangular bar H^2, which for the sake of lightness is ordinarily made hollow. On this bar the sliding block P is mounted, and this block carries the mechanism for revolving the drill which will now be described.

The end of the screw M′ is journaled at P′ in the sliding block P and terminates in a bevel gear M^2 meshing in the bevel gear Q^2 loose on the axle Q, and held thereon by the flange q of the said axle. On the opposite end of the shaft a handle or grip plate Q′ is provided for reasons that will be hereinafter given.

The hand crank R, provided with handle r, slides in guides q' in the face of the bevel gear Q^2, and is clamped at the desired position therein by means of the set screw q^2.

Where the power required is small or the passage contracted this hand crank will be shortened in. Where more power is necessary and there is plenty of room to work the hand crank will be made as long as desired.

W and W′ represent the footwall and roof of the heading, and w the hole bored by the drill.

The operation of the device is as follows:—The tubes A and B and the screw D are so adjusted that the roughened ends e and b' approximately touch the footwall W and roof W′ of the heading. Then the screw D is turned so as to make the roughened surfaces e and b' bite in the rock. Now the pivot plate H′ of the drill frame is put in its conical socket in the block F and the block F^2 is moved by means of the bolt F′ until the said plate and the frame H connected thereto are securely attached to the block F. This block F is now slid up to the desired position, and clamped there by means of the cap square K and the bolts k and nuts k'. The bit being in the chuck m, and the blocks L and L′ being out of engagement with the screw M′ the latter is slid longitudinally between these blocks until the point of the bit bears on the rock to be drilled; the blocks L and L′ are now brought into engagement with the screw M′, by means of the hand wheel N' and spindle N; the hand crank R is clamped in the desired position, and all is in readiness for the well known operation of drilling. After the drill steel or bit has penetrated to the desired depth, instead of turning the screw M′ backward and thus gradually withdrawing the bit, the operator turns the hand wheel N′ and thus disengages the two blocks L and L′ from the screw M′, and then grasping the handle Q′ in one hand and the handle r in the other, he readily and rapidly withdraws the drill from the bored hole.

The simplicity, efficiency, and cheapness of the herein-described construction will be evident to any one skilled in the art.

It will be evident from an inspection of Fig. 1, that when the column is set, the operator can drill any number of holes in any desired direction without changing the column; also that with slight modifications in the clamp, the drill may be readily attached to any ordinary form of tripod.

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

1. In a mining drill the combination with a suitable support, a block adjustably secured to said support and having a cone-shaped socket in one side thereof; of a drill frame having a cone-shaped lug adapted to engage in said cone-shaped socket, a guide bar H^2 extending from and integral with said drill frame, a block P sliding on the said guide bar, a screw M′ journaled in said block P and passing through a female screw threaded opening in the drill frame, a pinion fast on the rear end of said screw, a gear wheel journaled in said block P and meshing in said pinion, an adjustable hand lever for turning said pinion and means for releasing the screw from the screwthreads in the frame and withdrawing it from the rock, substantially as and for the purpose described.

2. In a mining drill, the combination with a suitable support, a block adjustably secured to said support and having a cone-shaped socket in one side thereof; of a drill frame having a cone-shaped lug adapted to engage in said cone-shaped socket, a guide bar H^2 extending from said drill frame, a block P sliding on the said guide bar, a screw M′ journaled in said block P and carrying a bit at its outer end, two sliding blocks moving in guideways in said drill frame and provided with a portion of a female screwthread cut in the inner side of each block, the said screwthreads normally engaging said screw M′, a gear wheel mounted in the sliding block P to mesh with a pinion on the end of the screw M′, and means for revolving the said gear wheel, to cause the screw M′ to advance, and means for releasing the said screw M′ from the screwthreaded blocks and withdrawing it from the rock; substantially as and for the purposes described.

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

ARTHUR E. BUZZO.

Witnesses:
T. W. SMITH,
EMIL LIORET.