

(No Model.)

R. H. ELLIOTT.

APPARATUS FOR OPERATING MINING DRILLS AND REAMERS.

No. 561,501.

Patented June 2, 1896.

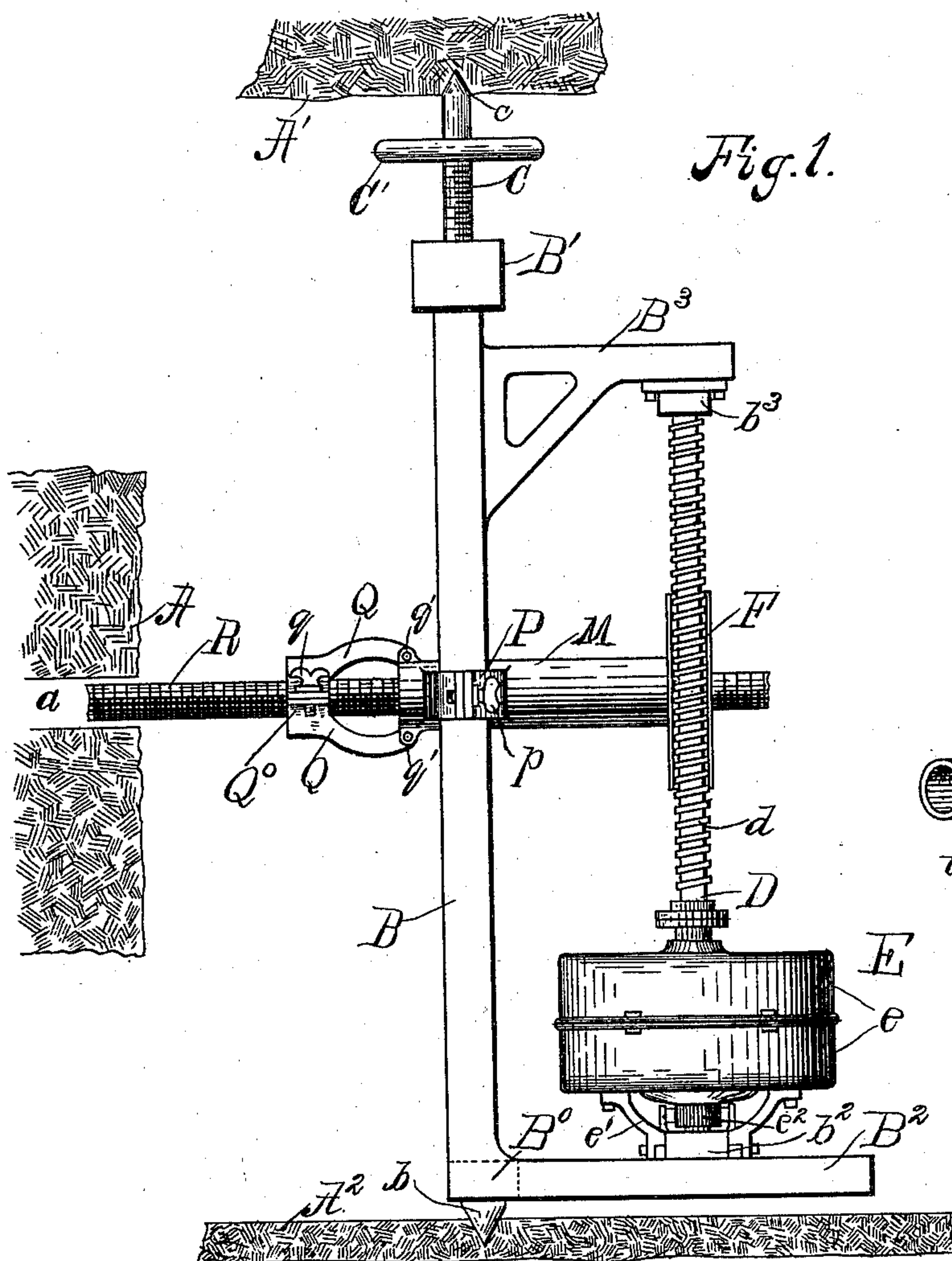


Fig. 1.

Fig. 3.

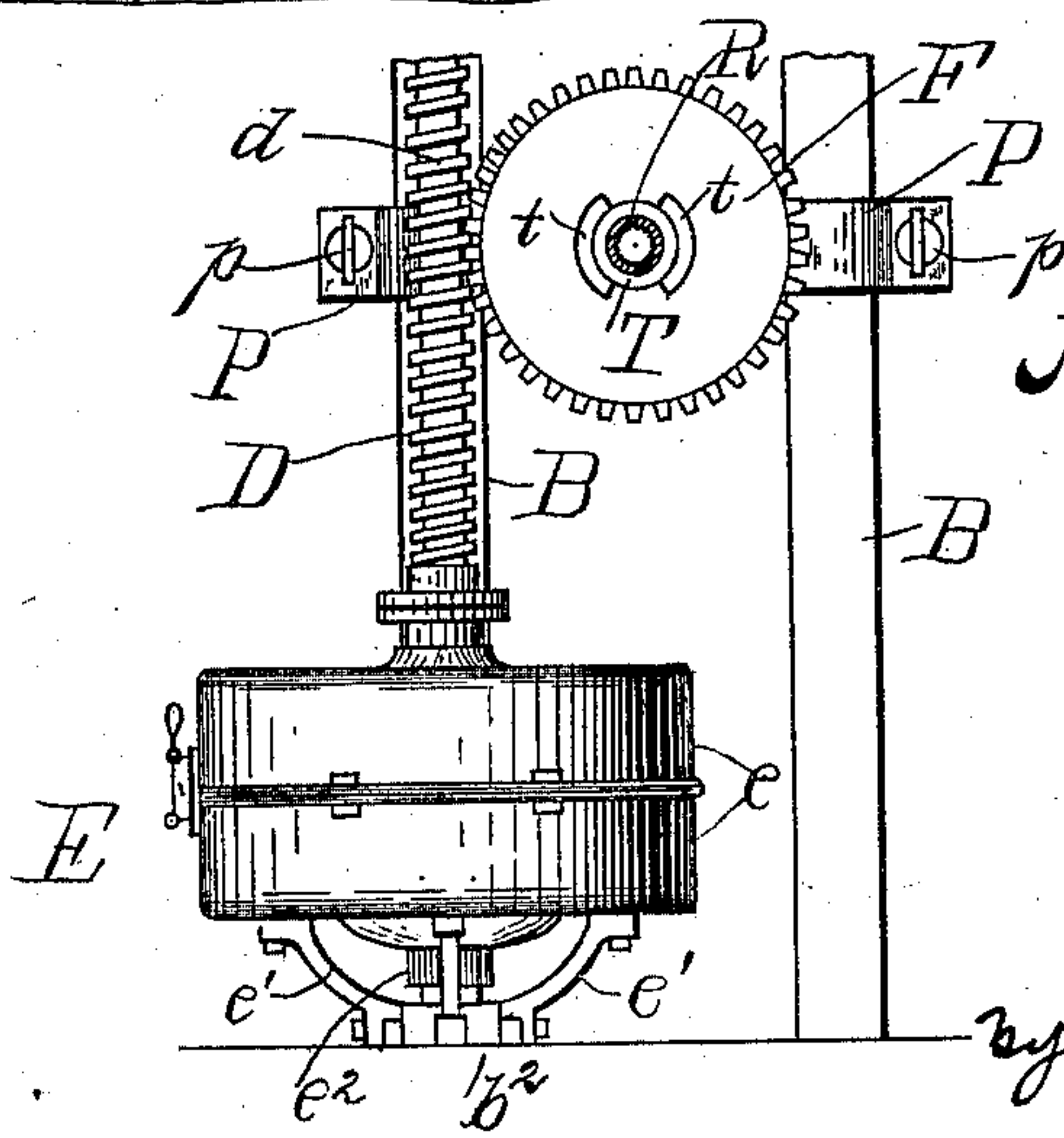
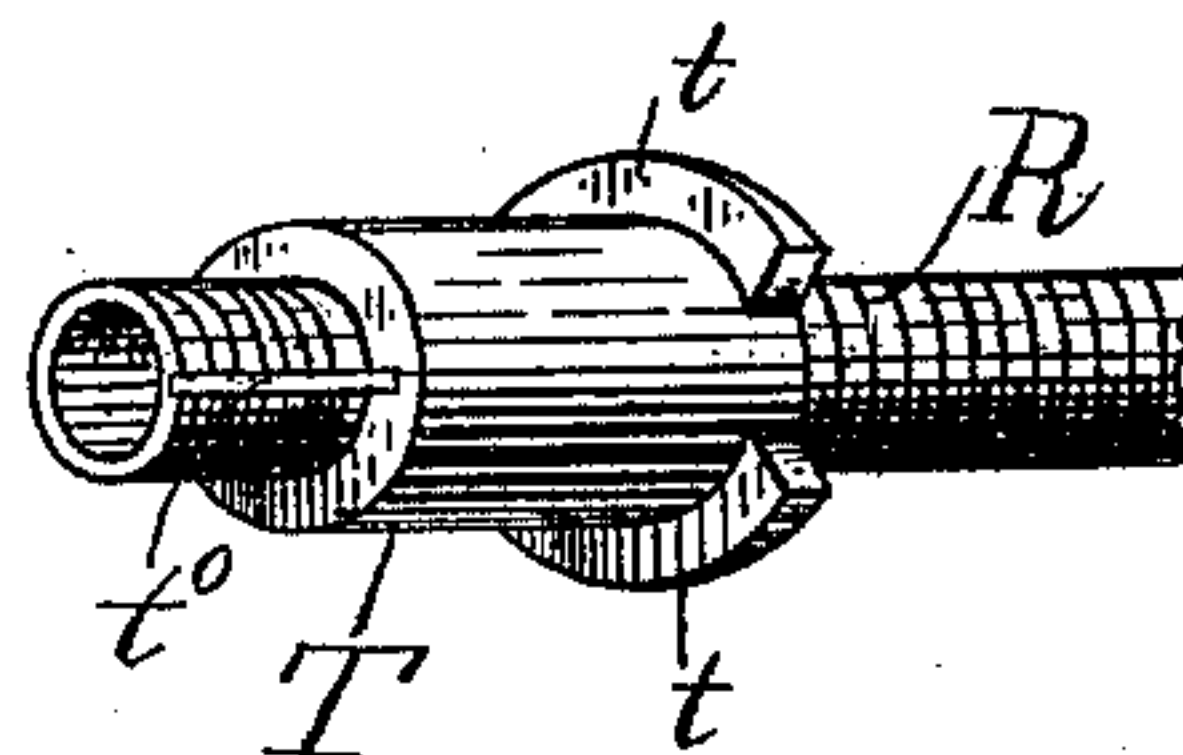


Fig. 2.

Witnesses
John H. Holt
Maurice J. Droussau.

Inventor
R. H. Elliott,
by Whitman & Wilkinson,
Attorneys.

UNITED STATES PATENT OFFICE.

ROBERT H. ELLIOTT, OF BIRMINGHAM, ALABAMA, ASSIGNOR TO THE
ALABAMA BLASTING AND MINING COMPANY, OF SAME PLACE.

APPARATUS FOR OPERATING MINING DRILLS AND REAMERS.

SPECIFICATION forming part of Letters Patent No. 561,501, dated June 2, 1896.

Application filed July 31, 1895. Serial No. 557,708. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. ELLIOTT, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Apparatus for Operating Mining Drills and Reamers; 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 apparatus for operating mining drills and reamers; and it consists in the herein-described arrangement and combination of parts and in certain novel details of construction which will be hereinafter described and claimed.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a side elevation of the operating-gear and attachments as used in reaming or drilling. Fig. 2 represents a rear view, showing details of the gearing and of the stand; and Fig. 3 represents a detail perspective view of the means for mounting the drive-wheel on the drill-spindle.

A represents the seam bored into, as at a , and A' represents the upper, and A^2 the lower, wall of the drift.

The drill-stand consists of a metallic frame provided with two upright posts B, connected together at the top by a cross-piece B' and at the bottom by a similar cross-piece B^0 . The lower cross-piece is provided with one or more holding-points b , and the upper cross-piece is provided with female screw-threads adapted to receive the adjusting-screw C, which has a holding-point c and is operated by the hand-wheel C' , whereby the said frame may be rapidly and securely clamped in position in the mine.

At the base of the frame are two rearwardly-projecting arms B^2 , spanned by a cross-bar b^2 , while near the top of the frame the two projecting arms B^3 are spanned by the bar b^3 , in which the end of the screw D is revolubly mounted. This screw is connected at its lower end to the armature of the electric motor E, which motor is inclosed in the dust-proof covers e and is of

the type ordinarily used for mining purposes. The commutator of this electric motor is placed beneath the motor, as at e^2 , and the field-magnets are supported on the spider e' , secured to the cross-piece b^2 .

The current is fed to the motor by any suitable electrical conductors, which are not shown.

The screw-threads d on the screw D engage in a worm-gear F, which is adapted to slide longitudinally on but to turn with the drill-spindle R. Thus the motion of the armature of the electric motor is converted into the motion of the drill-spindle, and it will be seen that by varying the pitch of the screw-thread d , and correspondingly of the worm-gear F, the relative speeds of the electric motor and of the drill-spindle may be varied within certain wide limits, which limits may be further increased by varying the diameter of the worm-wheel. Thus the herein-described arrangement may, by the substitution of a few parts, be readily adapted to different kinds of boring.

The worm-wheel F may be connected to the drill-spindle in a great variety of ways; but I prefer that shown in the drawings, in which M represents a hollow sleeve secured by means of the cross-piece P and the clamp-screws p to any desired position on the posts B. Feed is given to the drill-spindle R by means of the nut Q^0 , formed in halves, at the end of the arms Q, which are pivoted to the said sleeve M at q' and are clamped together at their outer ends by means of the clamp-screws q . When feeding, as in drilling, the feed-nut is in the position shown in Fig. 1; but when reaming the arms are thrown outward out of engagement with the drill-spindle and the drill-spindle simply revolves about its axis, barring a slight tendency to feed forward, which need not be considered in this connection. Journaled in this sleeve M is an inner sleeve T, which is connected by a feather t^0 to the drill-spindle and is provided with wedge-shaped flanges t , adapted to engage in corresponding recesses in the worm-wheel F, as shown in Figs. 2 and 3. By this arrangement the rotary motion of the electric motor produces a rotary motion in the drill-

spindle, while the longitudinal motion of the drill-spindle is provided for by the feed-nut, as has just been described.

By having the screw D and the drill-stand of considerable height the sleeve M, carrying the drill-spindle, may be raised or lowered to any desired position above the floor A², and this without any adjustment being required between the worm-gear F and the screw D. This is particularly desirable in order to save time over the troublesome adjustments ordinarily required when it is desired to bore at a high or a low elevation.

Again, the herein-described construction of frame enables the drill-stand to be readily and rapidly adjusted in the mine, and the construction of the whole apparatus is adapted to provide a cheap, simple, effective, and rapidly-operated means for boring and reaming.

Any desired form of boring or reaming tool may be adopted—such, for instance, as that shown in the patents to R. H. Elliott and J. B. Carrington, Nos. 530,510 and 530,511, or in my applications, Serial Nos. 552,949 and 552,950, filed June 15, 1895.

It will be obvious that various modifications of the herein-described apparatus might be made which could be used without departing from the spirit of my invention.

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

1. In an apparatus for operating mining drills and reamers, the combination with a stand and an electric motor mounted on said stand; of an extended screw secured to said armature-shaft, a holder for the drill-spindle adjustably mounted on said stand, and a worm-wheel rotating said drill-spindle and driven by said screw, and movable along the axis of said screw, substantially as described.

2. In an apparatus for operating mining drills and reamers, the combination with a stand and an electric motor mounted on said stand and having its armature-shaft in a vertical position, of a screw secured to said armature-shaft, a sleeve adjustably mounted on said stand, a feed-nut connected to said sleeve and adapted to feed the drill-spindle, a drill-spindle revolubly mounted in said sleeve, and a worm-wheel rotating said drill-spindle and operated by said screw, substantially as described.

3. In an apparatus for mining drills and

reamers, the combination with a stand and an electric motor mounted on said stand and having its armature-shaft in a vertical position, of a screw secured to said armature-shaft, a sleeve adjustably mounted on said stand, an adjustable feed-nut connected to said sleeve, and adapted to be thrown into and out of engagement with the drill-spindle, a drill-spindle revolubly mounted in said sleeve, a worm-wheel revolubly mounted on said sleeve, and means for connecting the said worm-wheel with the said drill-spindle, whereby said screw is caused to rotate said drill-spindle, substantially as described.

4. In an apparatus for operating mining drills and reamers, the combination with a stand provided with the vertical posts B, the cross-bars B⁰ and B¹ and the holding-point b, with the arms B² and B³, of an adjusting-screw C engaging in one of said cross-bars, and adapted to clamp said stand in the desired position, an electric motor having its armature-shaft journaled between the said arms B² and B³, and a screw D forming the continuation of said armature-shaft, of a holder for the drill-spindle and means for clamping the said holder to the said frame, a worm-wheel revolubly mounted on said holder, and means for connecting said worm-wheel with the drill-spindle, substantially as described.

5. In an apparatus for operating mining drills and reamers, the combination with a stand provided with the vertical posts B, with cross-bars between the same, and a holding-point projecting from one of said cross-bars, with arms projecting laterally from said posts, of an adjusting-screw engaging in one of said cross-bars and adapted to clamp said stand in the desired position, an electric motor having its armature-shaft journaled between the said arms, and a screw forming the continuation of said armature-shaft, a holder for the drill-spindle and means for clamping the said holder to the said frame, and a drill-spindle revolubly mounted in said holder, and a worm-wheel meshing in said screw and adapted to rotate said drill-spindle, substantially as described.

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

ROBERT H. ELLIOTT.

Witnesses:

J. B. CARRINGTON,
WILL. T. DILLON.