(No Model.)

2 Sheets—Sheet 1.

J. R. HOWELLS & G. SHELLEY.

MINING MACHINE.

No. 300,076. Patented June 10, 1884.

Fig. 1.

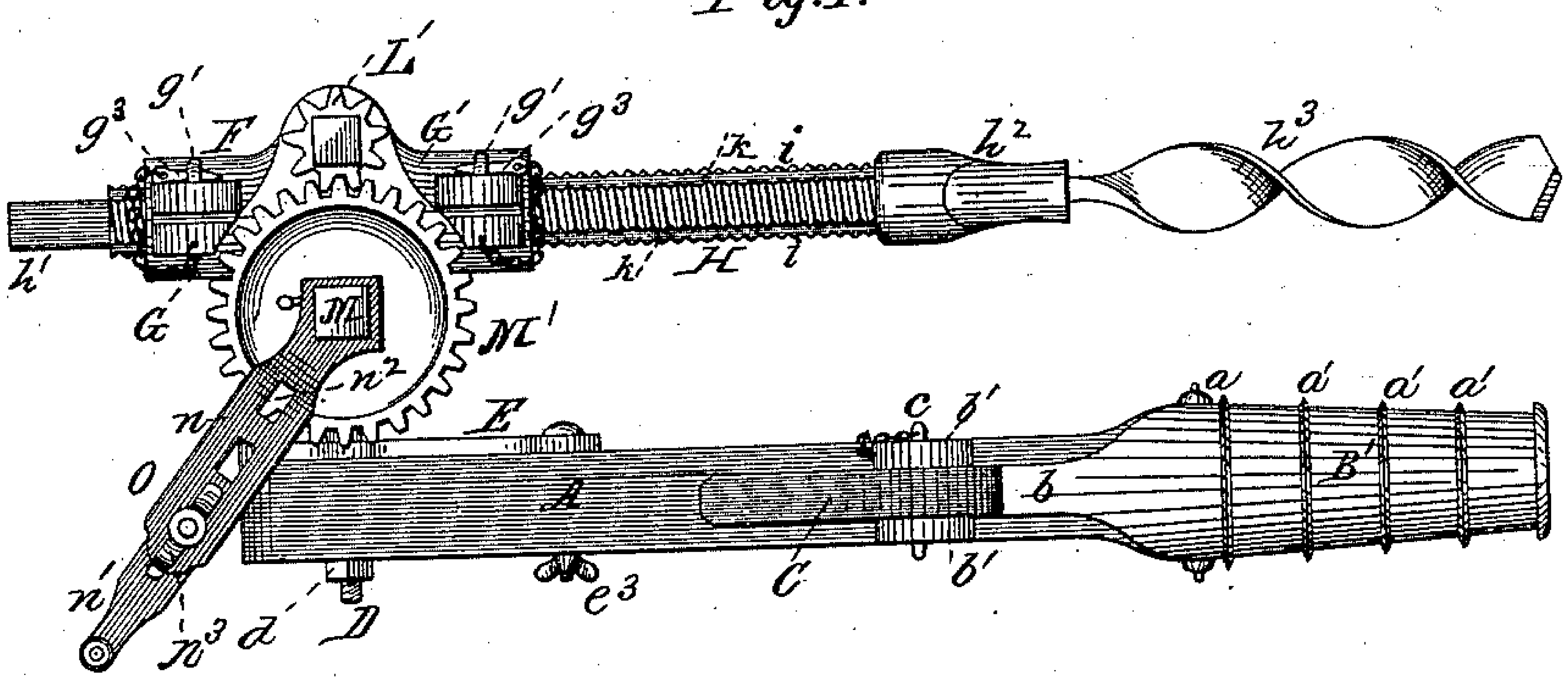


Fig. 2.

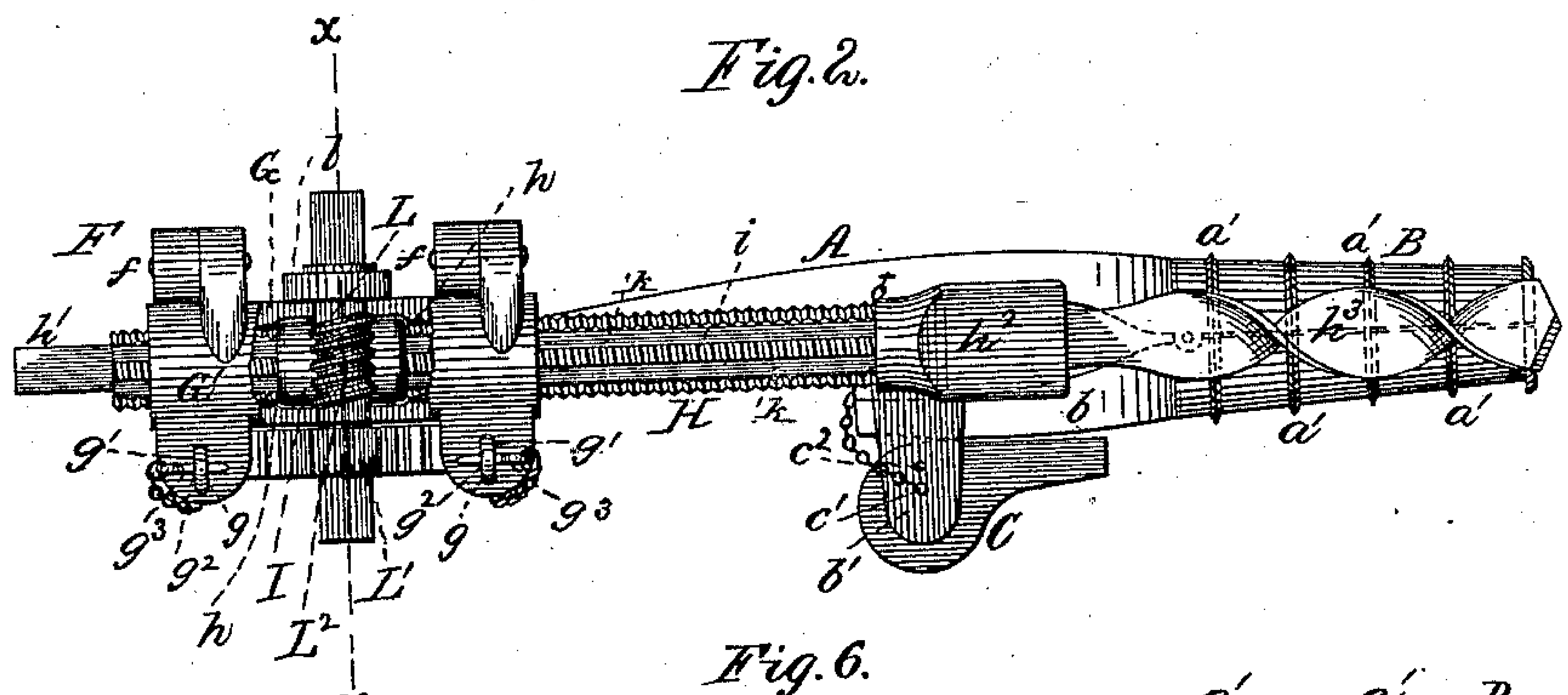
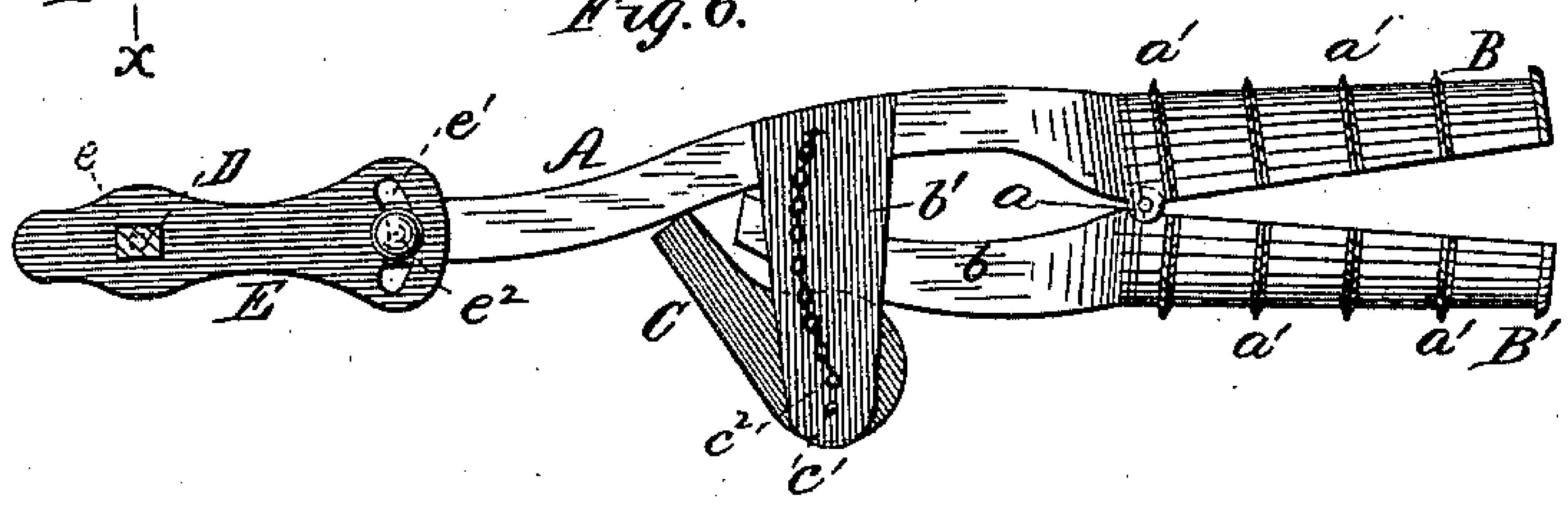


Fig. 6.



Witnesses:
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Fred F. Church

Inventors:
John R. Howells
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their Attorney.

(No Model.) 2 Sheets—Sheet 2.

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MINING MACHINE.

No. 300,076. Patented June 10, 1884.

Fig. 3.

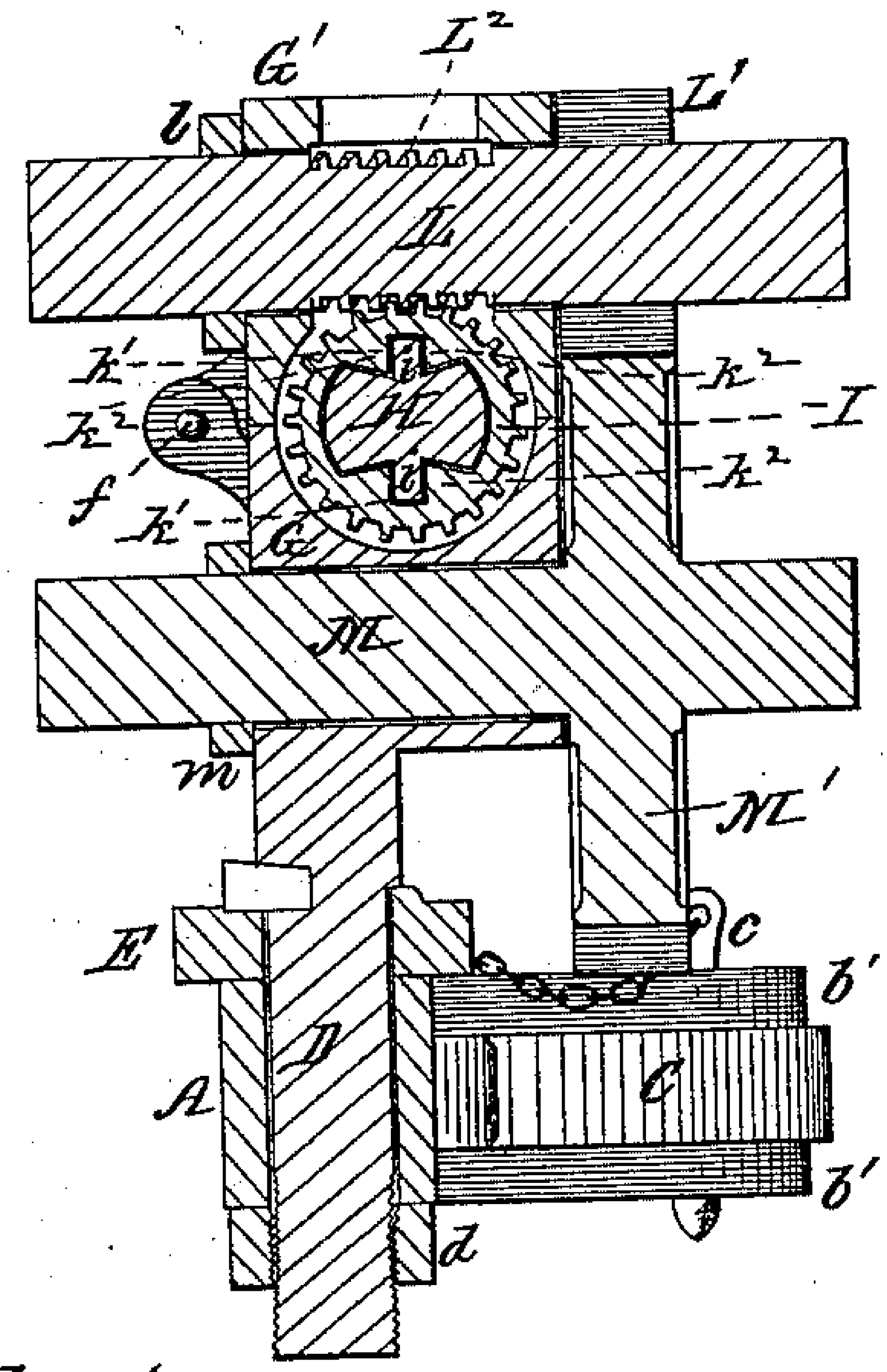


Fig. 4.

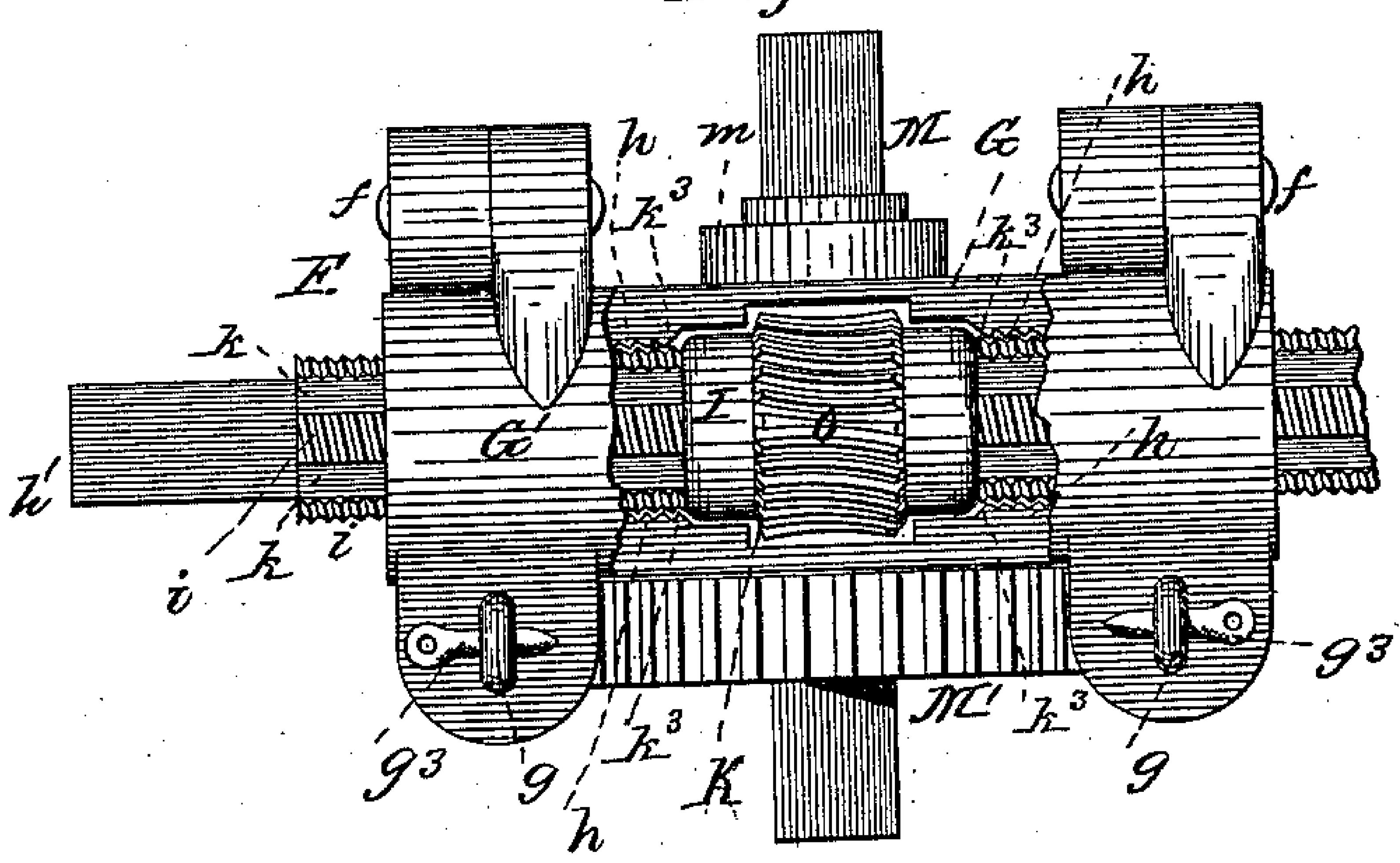
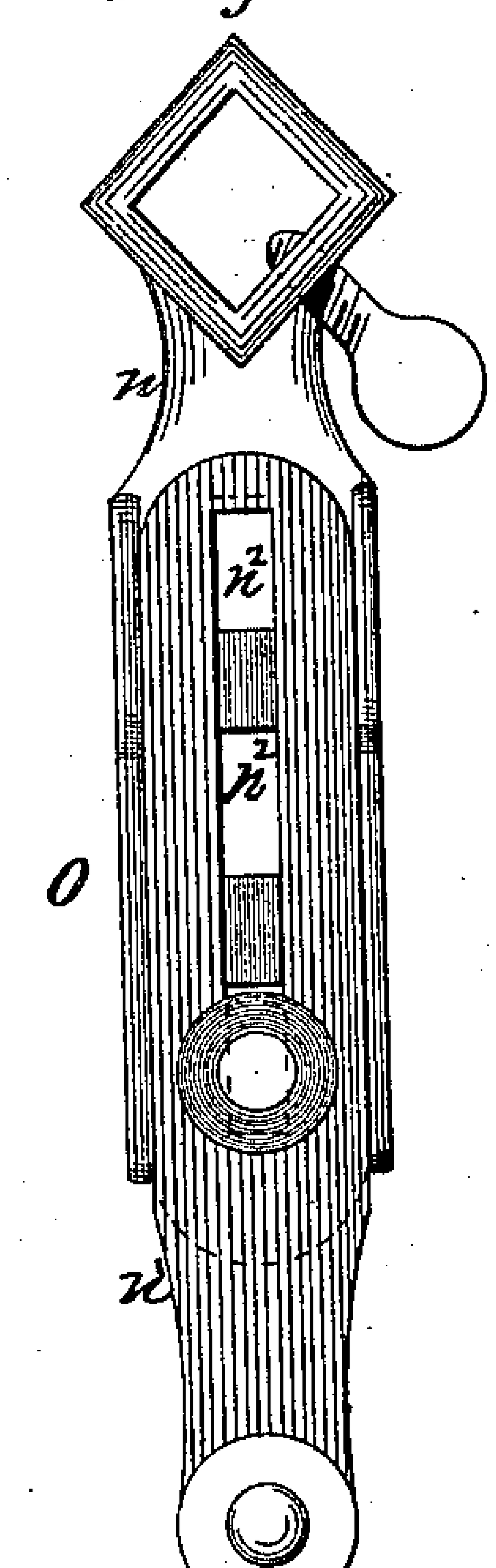


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN R. HOWELLS, OF PLYMOUTH, AND GEORGE SHELLEY, OF WILKES BARRÉ, PENNSYLVANIA.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 300,076, dated June 10, 1884.

Application filed September 25, 1883. (No model.)

To all whom it may concern:

Be it known that we, JOHN R. HOWELLS, a citizen of the United States, residing at Plymouth, in the county of Luzerne, State of Pennsylvania, and GEORGE SHELLEY, a citizen of the United States, residing at Wilkes Barré, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Mining-Machines; and we 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.

Our invention relates to certain improvements in hand-drills for miners' use, and has for its object to provide a drill which can be used either for boring coal or hard rock, (it is more particularly an improvement on Patent No. 230,590;) and it consists in certain novel construction and arrangement of the various parts, whereby the drill is made much stronger, is more compact in form, can be manufactured cheaper, and can be run at a high or low rate of speed, as desired, being run at a high rate of speed when the same is used in boring soft coal, and at a lower rate of speed, though with greater power, when used in boring rock. This feature is very essential, as it prevents, to a great extent, the danger of breakage when the drill is used in boring rock.

The particular arrangement of the various parts I will now proceed to describe, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a side elevation of the drill; Fig. 2, a top plan with the upper portion of the box or frame broken away. Fig. 3 is a vertical cross-section taken on line *x x*, Fig. 2. Figs. 4 and 5 are details. Fig. 6 is a plan of the stock and expansible jaws.

Referring to said drawings, similar letters of reference indicate like parts.

A represents the stock of the drill, having on its outer end, and formed as part of said stock, the stationary jaw B.

B′ is a movable jaw hinged or fulcrumed to the stationary jaw at *a*, and having the arm or extension *b*, the rear end of said arm *b* working between the guides *b′ b′* on the stock A.

a′ are teeth or knives on the jaws B B′.

C is a cam mounted upon a pin, *c*, which pin has its bearings in the holes *c′ c²* in the guides *b′*. Said cam C operates upon the arm *b*, and when the cam is drawn back to the position shown in Fig. 6 it expands the jaws B and B′, for a purpose hereinafter set forth. When the expansion is not sufficient, the pin is inserted in the holes *c²*, thus bringing the fulcrum nearer the arm *b*, and when the cam is drawn back it expands the jaws to their fullest extent.

D is a standard or bolt which supports the operating mechanism of the drill, and secures the same to the stock A.

E is a flat metal plate having in one end a hole, *e*, through which passes the bolt, D. Said bolt D is keyed to the plate E, or secured to the same in any other suitable manner, and passes through a hole in the rear of the stock A, and is secured to said stock by a nut, *d*, thus pivoting the plate E to the stock. In this plate is a segmental slot, *e′*. Through this slot and the stock there is passed the bolt *e²*, on one end of which is the thumb-nut *e³*. By screwing up this thumb-nut the plate is firmly secured to the stock, and by unscrewing it the plate is free to be turned to the right or left, and it can be held at any angle by turning up the screw. The bit can thus be turned at any desired angle, and several holes be bored while the apparatus is fixed in one place.

F is a box or frame forming the bearing for the screw-feed shaft and operating mechanism of the drill. Said box is formed in two parts, G and G′. The lower part, G, is cast with the bolt or standard D, or may be secured to it in any other suitable manner. The upper part, G′, is hinged to the part G at *f f*. *g g* are slots in one side of the part G′, which fit over the lugs *g′ g′*.

g² g² are holes in the lugs, in which holes are inserted the pins *g³ g³*, thus securely locking the two parts together. The box or frame F is threaded on its inner side at *h h*.

H is a screw-feed having its bearing in the box F, the thread on the screw-feed engaging with the thread in the box F. One end of said screw-feed is shouldered, as at *h′*, to re-

ceive a crank-handle. To the other end is secured in any suitable way the bit-stock h^2 and bit h^3.

I is a sleeve surrounding the screw-feed H. *i i* are keys on the screw-feed H, formed by the grooves *k k k k* on each side of the keys *i i*. Said keys fit into the key-seats *k' k'*, formed by the lugs k^2 k^2 k^2 k^2 on the inner side of the sleeve I, which lugs enter the grooves *k k*. The sleeve I rests in the recessed portion K of the box F, and is prevented from a longitudinal motion by the shoulders k^3. By this construction the screw-feed revolves as the sleeve turns, and is thus fed forward or backward, as desired. The sleeve I is provided with a worm or other gear, *o*, which meshes with the worm-gearing hereinafter described.

L is a shaft having its bearing in the upper part or lid, G', of the box F. Both ends of said shaft are shouldered to receive a crank handle or handles.

L' is a pinion mounted on the shaft L.

L^2 is a worm on said shaft L, which meshes with the gearing on the sleeve I and causes the same to revolve, and thus operate the screw-feed as the shaft L is turned. The lateral displacement of said shaft L is prevented by the collar *l*, secured to the shaft in any suitable manner.

M is a shaft having its bearings in the lower part, G, of the box F, both ends of which are shouldered to receive crank-handles.

M' is a gear-wheel mounted upon the shaft M, and meshes with the pinion L'. The lateral displacement of this shaft is prevented by the collar *m*, secured to the same in any suitable manner.

O is the crank-handle, formed in two parts, N and N', and having the slots N^2 and thumb-nuts N^3, by means of which the crank-handle can be lengthened or shortened, as desired.

The operation of our device is as follows: The jaws B B' are inserted in a hole made where the drilling is to be done. The cam C is drawn back to the position shown in dotted lines, Fig. 6, the jaws are expanded, and the teeth or knives take hold of the coal or rock, and hold the same firmly in position.

If the drill is to be used in drilling coal, the crank is applied to the shaft M, and by turning this shaft the wheel M' is revolved, which, meshing with the pinion L', turns the shaft L and worm L^2, which in turn meshes with the gearing on the sleeve I, and causes the same to revolve, and thus operates the screw-feed. When the drill is used in boring stone, the crank is applied to the shaft L, and the screw-feed is run with less speed, though with greater power; or the crank can be applied directly to the end of the shaft.

If desired, a crank-handle can be put on each end of the shafts M and L. When the hole is drilled a sufficient depth, the drill can be withdrawn by reversing the motion of the crank, or by removing the pins and raising the upper part or lid, G', lifting the screw-feed from contact with the thread, and moving the same back to its first position.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a mining-drill, the box F, supported on a suitable standard and formed in two parts, having screw-threads on the inside, the feed-screw H, shouldered at one end, having its bearing in the box F, and engaging with the screw-thread in the same, and the sleeve I, surrounding the feed-screw H, and having gearing on its periphery, in combination with the shaft L, shouldered at each end, having the worm-gear L^2 and pinion L' mounted on said shaft, and the shaft M, shouldered at each end, and having the gear-wheel M' mounted on the same and meshing with pinion L', all arranged and operating to the end that the drill may be run at a high or low rate of speed, as desired.

2. In a mining-drill, the box F, supported on a suitable standard, and formed in two parts hinged together, having screw-threads on the inside, the feed-screw H, shouldered at one end, having its bearing in the box F, and provided with the keys *i i* and grooves *k*, and the sleeve I, surrounding the feed-screw H, and having the lugs k^2, forming key-seats, and the gearing *o* on its periphery, in combination with the shaft L, shouldered at each end, having the worm-gear L^2 and pinion L' mounted on said shaft, and the shaft M, shouldered at each end, and having the gear-wheel M' mounted on the same and meshing with the pinion L', all arranged and operating substantially as and for the purpose shown and described.

3. In a mining-drill, the standard D, pivoted in the stock A and secured to the adjustable plate E, the box F, supported by the standard D and formed in two parts, having screw-threads on the inside, the feed-screw H, shouldered at one end, having its bearing in the box F, and the sleeve I, surrounding the feed-screw H, and having gearing on its periphery, in combination with the shaft L, shouldered at each end, and having the worm-gear L^2 and pinion L' mounted on said shaft, and the shaft M, shouldered at each end, and having the gear-wheel M' mounted on the same and meshing with the pinion L', substantially as and for the purpose shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN R. HOWELLS.
GEORGE SHELLEY.

Witnesses:
ROBERT BAUR,
RICHARD M. HOWELLS.