

(No Model.)

2 Sheets—Sheet 1.

J. R. HOWELLS.

MINING DRILL.

No. 384,165.

Patented June 5, 1888.

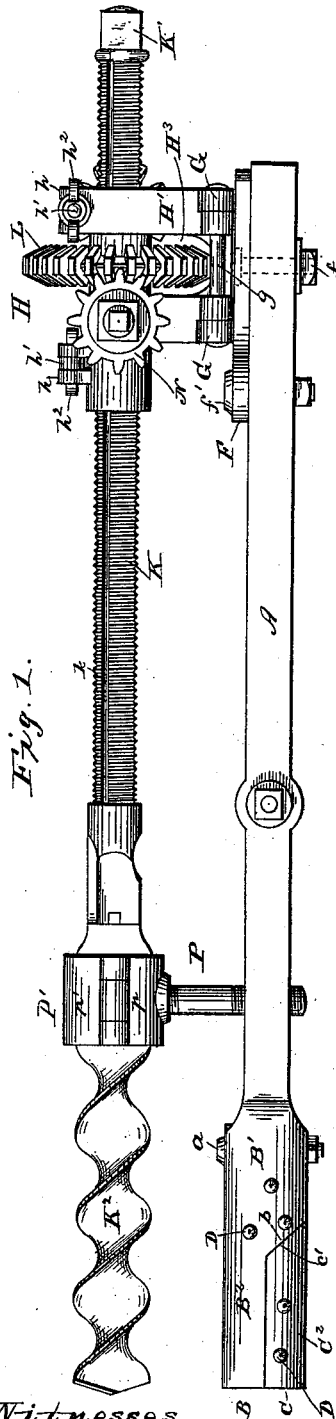


Fig. 1.

Fig. 3.

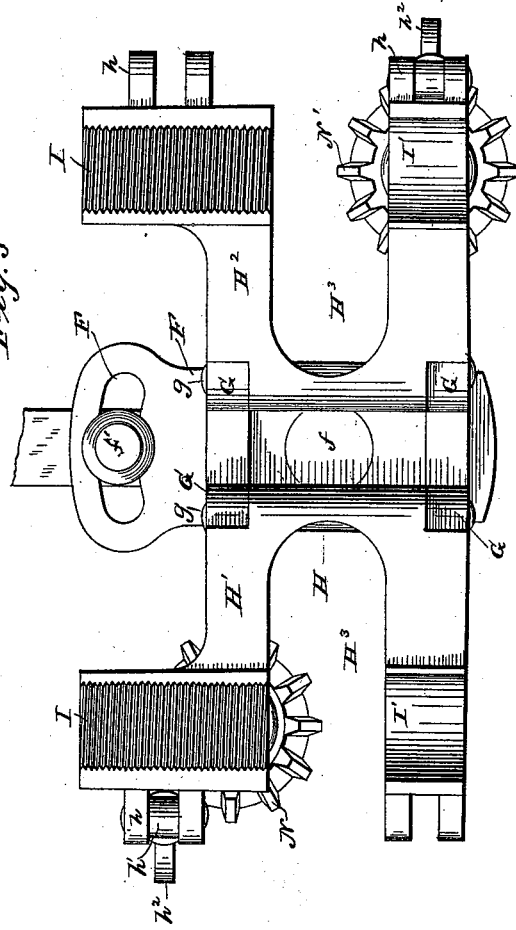
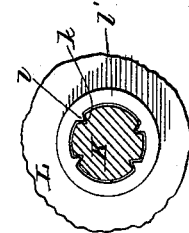


Fig. 6.



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A. J. Stewart.

Inventor,  
John R. Howells.  
By Frank D. Jones,  
his Attorney.

(No Model.)

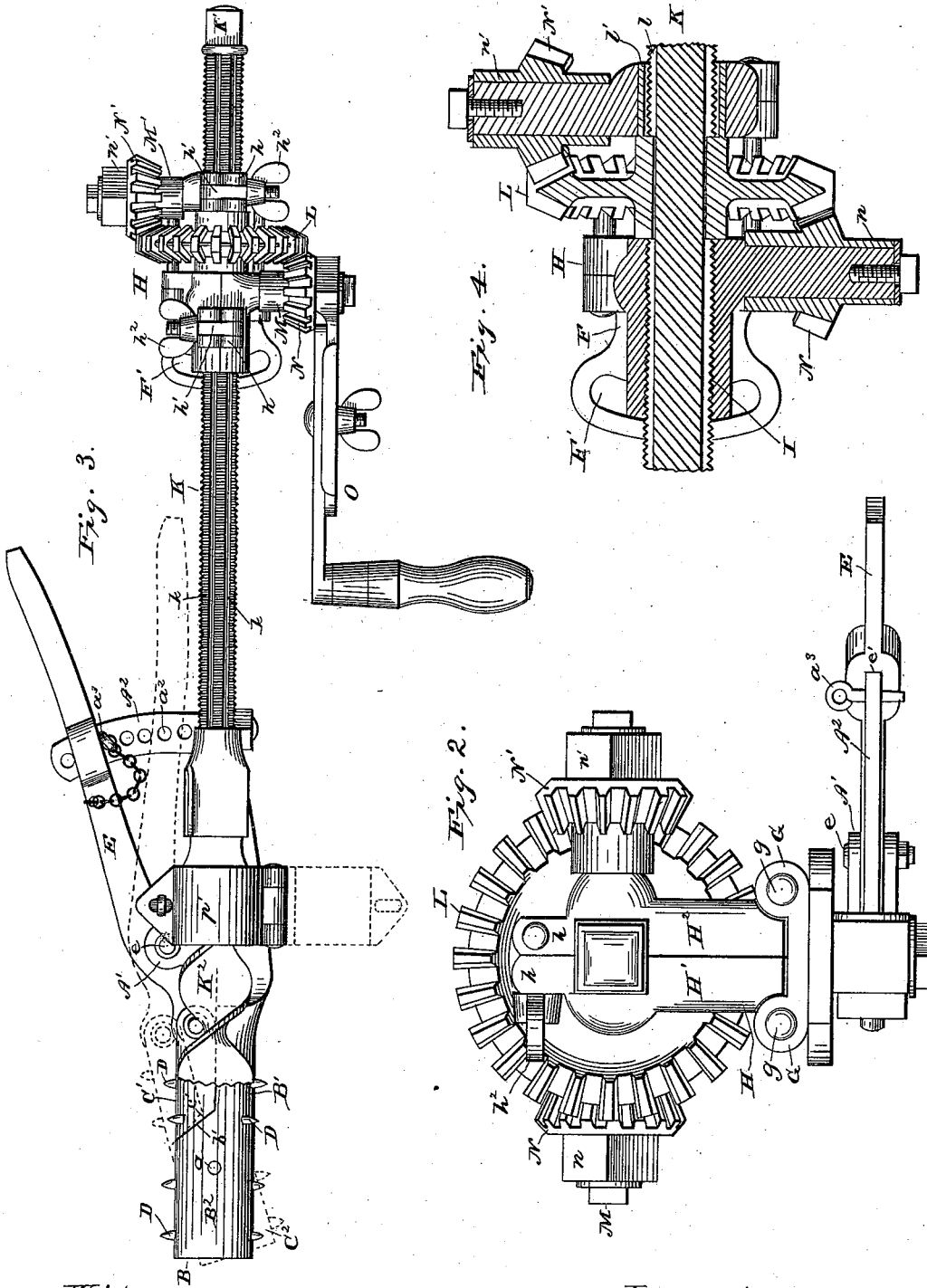
2 Sheets—Sheet 2.

J. R. HOWELLS.

MINING DRILL.

No. 384,165.

Patented June 5, 1888.



Witnesses.  
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Inventor.  
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# UNITED STATES PATENT OFFICE.

JOHN R. HOWELLS, OF PLYMOUTH, ASSIGNOR OF ONE-HALF TO RICHARD M. HOWELLS, OF WILKES-BARRÉ, PENNSYLVANIA.

## MINING-DRILL.

SPECIFICATION forming part of Letters Patent No. 384,165, dated June 5, 1888.

Application filed June 8, 1887. Serial No. 240,642. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN R. HOWELLS, a citizen of the United States, residing at Plymouth, in the county of Luzerne and State of Pennsylvania, 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 certain improvements in hand-drills for miners' use; and it consists in certain novelty in the construction and arrangement of the various parts, all of which I will now proceed to point out and describe, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a drill embodying my invention; Fig. 2, an end elevation; Fig. 3, a view at right angles to that in Fig. 1; Fig. 4, a vertical longitudinal section of part of Fig. 1, and Figs. 5 and 6 details of various parts of my said invention.

Referring to said drawings, A represents the stock of the drill provided on its outer end with a stationary jaw, B, formed in two semi-cylindrical parts, B' B<sup>2</sup>, having the beveled shoulders b b', the diametrical planes of said parts B' B<sup>2</sup> being at right angles to each other.

C is a movable jaw, formed in two semi-cylindrical parts, C' C<sup>2</sup>, having the beveled shoulders c c', the diametrical planes of said parts also being at right angles to each other.

The jaws B and C are pivoted to each other at or near their longitudinal center by a pin, a, passing through the parts B C. The semi-cylindrical parts of the jaw C being arranged the reverse of the parts of the jaw B, so that when said jaws are closed they form approximately a cylindrical drill-holding head.

The jaws B and C are provided with teeth D.

E is a lever fulcrumed on a bolt or pin, e, mounted in bearings A', secured to the stock at a point just back of the jaw B. The short arm of this lever is hinged to the rear end of the movable jaw C. e' is a slot in the long arm of the lever, through which passes a segmental arm, A<sup>2</sup>, secured to the stock. Said arm A<sup>2</sup> is provided with pin-holes a<sup>2</sup>, in which are inserted a removable locking-pin, a<sup>3</sup>, to re-

tain the lever as adjusted. The cylindrical head formed by the jaws B and C forms a device for securing the drill in place while the drilling is being done, and its operation will be hereinafter set forth.

F is a flat plate or turn-table pivotally secured to the rear end of the stock A by a bolt, f. In the forward portion of the plate F is a segmental slot, F'. Passing through the slot F' and through a suitable hole in the stock is a bolt, f', provided with a clamping-nut. When the nut of the bolt f' is tightened, the plate is held as adjusted, and when loosened the plate can be turned as desired, for a purpose hereinafter set forth.

G are lugs on the upper side of the plate F. In these lugs are secured pins g g.

H is a supporting-frame forming the bearing for the feed-screw shaft and operating mechanism of the drill. Said frame is formed in two parts, H' H<sup>2</sup>, hinged to the pins g g and provided on their upper portions with lugs h h and hinged locking-bolts h' h'; having suitable thumb-nuts, h<sup>2</sup>, adapted to engage with the lugs h h and secure the two parts H' H<sup>2</sup> together. Any other suitable securing device may be used, if desired. The central portion of the frame H is recessed or cut away at H<sup>3</sup>, for a purpose hereinafter described.

I is an internally-screw-threaded sleeve on the forward upper portion of the frame H; I', a smooth bearing on the upper rear portion of said frame H.

K is the screw-feed shaft, having its bearing in the sleeve I and engaging with the screw-thread of said sleeve. The rear end of said screw-feed shaft is shouldered or keyed at K' to receive a crank-handle. To the forward end is secured in any suitable manner a bit, K<sup>2</sup>.

k are longitudinal grooves or key-seats in the shaft K.

L is a double bevel-gear mounted on the shaft K, the inside of its hub being provided with lugs or keys l, which engage with the key-seats k. As the gear is revolved, the screw-feed shaft K is also revolved, and, engaging with the thread of the sleeve I, is fed forward or backward, as desired.

The gear L is located in the recessed or cut-away portion of the frame, and its hub l' is ex-

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tended and is mounted in the bearing I'. This gives the gear a very firm bearing, and keeps it perfectly steady as said gear is operated.

M M' are projecting bearings on the diagonally-opposite upper corners of the frame H at right angles to the screw-feed shaft. On these bearings are mounted beveled pinions N N', engaging with opposites sides of the double bevel-gear L. Said pinions are keyed at *n n'* to receive a crank-handle.

O is an extensible crank-handle. In the drawings it is shown attached to the end of the screw-feed shaft. It may, however, be attached to either of the pinions N N'; or two crank-handles may be used, one attached to each pinion.

P is a rod screwed into or otherwise secured to the stock at a point just back of the jaws. On the upper end of this rod is a collar, P', which surrounds the bit and forms a guide for the same. Said collar is formed in two parts, *p p'*, the lower part, *p*, being rigidly secured to the rod P, the upper part, *p'*, being hinged on one side to the part *p* and provided on its other side with a suitable locking device. When desired, the collar P can be opened to remove the bit.

My improved drill may be used for drilling coal or rock.

The operation of the device is as follows: A hole is made in the wall of coal or other material, at the spot where the drilling is to be done, of suitable dimensions to receive the cylindrical head formed by the jaws B and C. The long arm of the lever is drawn in toward the stock, thus opening or expanding the jaws until the teeth grip the sides of the hole. When the jaws have been sufficiently expanded, the lever is locked as adjusted by means of the locking-pin *a'*. As said jaws are pivoted to each other at about their central portion, they open or expand in a reverse direction, or at their inner and outer ends, thus securely gripping or tightening the jaws on the inner and outer portion of the hole, and holding the stock firmly and solidly in position while working. This is a great advantage over securing devices of this class which have heretofore been used. When the stock is firmly secured in position, the handle is applied to the end of the shaft, or to either of the pinions, as desired. The shaft being turned, the screw-feed shaft engaging with the thread in the sleeve I feeds the bit as said shaft revolves.

The construction of the various parts of the operating mechanism, as described, keeps said parts perfectly steady while in operation. As heretofore stated, two handles may be used, one on each of the pinions. When it is desired to withdraw the bit from the hole drilled, the parts of the frame are unlocked and opened, so that the thread of the sleeve is entirely clear from the thread of the screw-feed shaft, and said shaft is quickly and easily removed without interfering with the thread. The upper part of the collar P can also be opened. The drill is then left entirely free. If it is desired

to drill a number of holes without moving the drill, the rod P, supporting the collar or guide P', is removed from the shaft, the bolt *f'* is loosened, and the plate F moved until the screw-feed shaft and bit are at the desired angle. The bolt *f'* is then tightened and the drill is again ready for operation.

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

1. In a mining-drill, a stock carrying the drilling mechanism and provided on its forward end with a holder or securing device composed of two expansible jaws having gripping-surfaces at their forward and rear ends and pivotally secured to each other at a point between their forward and rear gripping-surfaces, and devices for operating said jaws, whereby the gripping-surfaces of the same may be expanded on each side of the pivotal point, all constructed, arranged, and operating substantially as shown and described, as and for the purpose set forth.

2. In a mining-drill, the stock A, carrying the drilling mechanism and having on its forward end the stationary jaw B, formed in two semi-cylindrical parts, B' B<sup>2</sup>, in combination with the removable jaw C, formed in two semi-cylindrical parts, C' C<sup>2</sup>, centrally pivoted to the jaw B and forming with said jaw a drill-holding head, and provided with the operating-lever E, all arranged and operating substantially as shown and described.

3. In a mining-drill, the combination of the stock A, carrying the drilling mechanism and having on its forward end the stationary jaw B, formed in two semi-cylindrical parts, B' B<sup>2</sup>, the movable jaw C, formed in two semi-cylindrical parts, C' C<sup>2</sup>, centrally pivoted to the jaw B and forming with said jaw a drill-holding head, the operating-lever E, having the slot *e'* and the segmental arm A<sup>2</sup>, secured to the stock and provided with pin-holes *a'*, and the securing-pin *a'*, all arranged and operating substantially as shown and described.

4. In a mining-drill, a suitable stock and a plate or turn-table pivotally secured to the rear end of the stock, in combination with a supporting-frame composed of two separable parts, each hinged to the plate or turn-table and having an internally-screw-threaded sleeve formed in the frame, and a screw-feed shaft mounted in the screw-threaded sleeve and having its rear end shouldered or keyed to receive a handle and provided on its forward end with a suitable bit, all constructed, arranged, and operating substantially as shown and described.

5. In a mining-drill, a suitable stock, a plate or turn-table pivotally secured to said stock, a supporting-frame for the drill and operating mechanism, formed in two separate parts, hinged to the plate or turn-table, and having its central portion cut away, as described, and provided with an internally-threaded sleeve and smooth bearing in a line with each other and on opposite sides of its cut-away portion,

in combination with a double bevel-gear located in the cut-away portion of the supporting-frame and having its hub extended and mounted in the bearing on said frame, and  
 5 provided on the inside of its hub with lugs or keys, a screw-feed shaft provided with longitudinal grooves or key-seats and mounted in the screw-threaded sleeve and extending through the hub of the bevel-gear, the lugs or  
 10 keys in said hub engaging with the grooves or key-seats on the shaft, and suitable bevel-pinions mounted on bearings projecting from the opposite sides of the supporting-frames, said pinions engaging with the opposite sides of  
 15 the bevel-gear and being keyed to receive a crank-handle, all constructed, arranged, and operating substantially as shown and described.

6. In a mining-drill, a stock, A, provided  
 20 on its forward end with a suitable drill-holding head, a plate or turn-table, F, pivotally secured to the rear end of the stock and provided with the segmental slot F' and clamping-bolt f', a supporting-frame, H, formed in two  
 25 separable parts, H' H<sup>2</sup>, each hinged to the plate F, and having the internally-screw-threaded sleeve I, in combination with a screw-feed shaft, K, mounted in the screw-threaded sleeve and having its rear end shouldered or  
 30 keyed to receive a crank-handle, and provided on its forward end with a suitable bit, all constructed and arranged substantially as shown and described.

7. In a mining-drill, a stock, A, a plate or turn-table, F, pivotally secured to said stock, 35  
 a supporting-frame, H, formed in two separable parts, H' H<sup>2</sup>, hinged to the plate F and having its central portion recessed or cut away at H<sup>3</sup>, and provided with the internally-screw-threaded sleeve I and bearing I' in a line with 40  
 each other and on opposite sides of the cut-away portion of the frame, in combination with a double bevel-gear, L, located in the cut-away portion of the frame and having its hub 45  
 L' extended and mounted in the bearing I', and provided on the inside of its hub with lugs or keys l, a screw-feed shaft, K, provided with longitudinal grooves or key-seats k and 50  
 mounted in the screw-threaded sleeve I and extending through the hub of bevel-gear L, the lugs or keys l in said hub engaging with the grooves or key-seats k on said shaft, and suitable bevel-pinions, N N', mounted on bearings M M', projecting from opposite sides of 55  
 the supporting-frame, said pinions engaging with opposite sides of the bevel-gear and being keyed at n n' to receive crank-handles, all constructed, arranged, and operating substantially as shown and described.

In testimony whereof I affix my signature in 60  
 presence of two witnesses.

JOHN R. HOWELLS.

Witnesses:

THOMAS J. OHLMANN,  
 WILLIAM S. HARRIS.