

(No Model.)

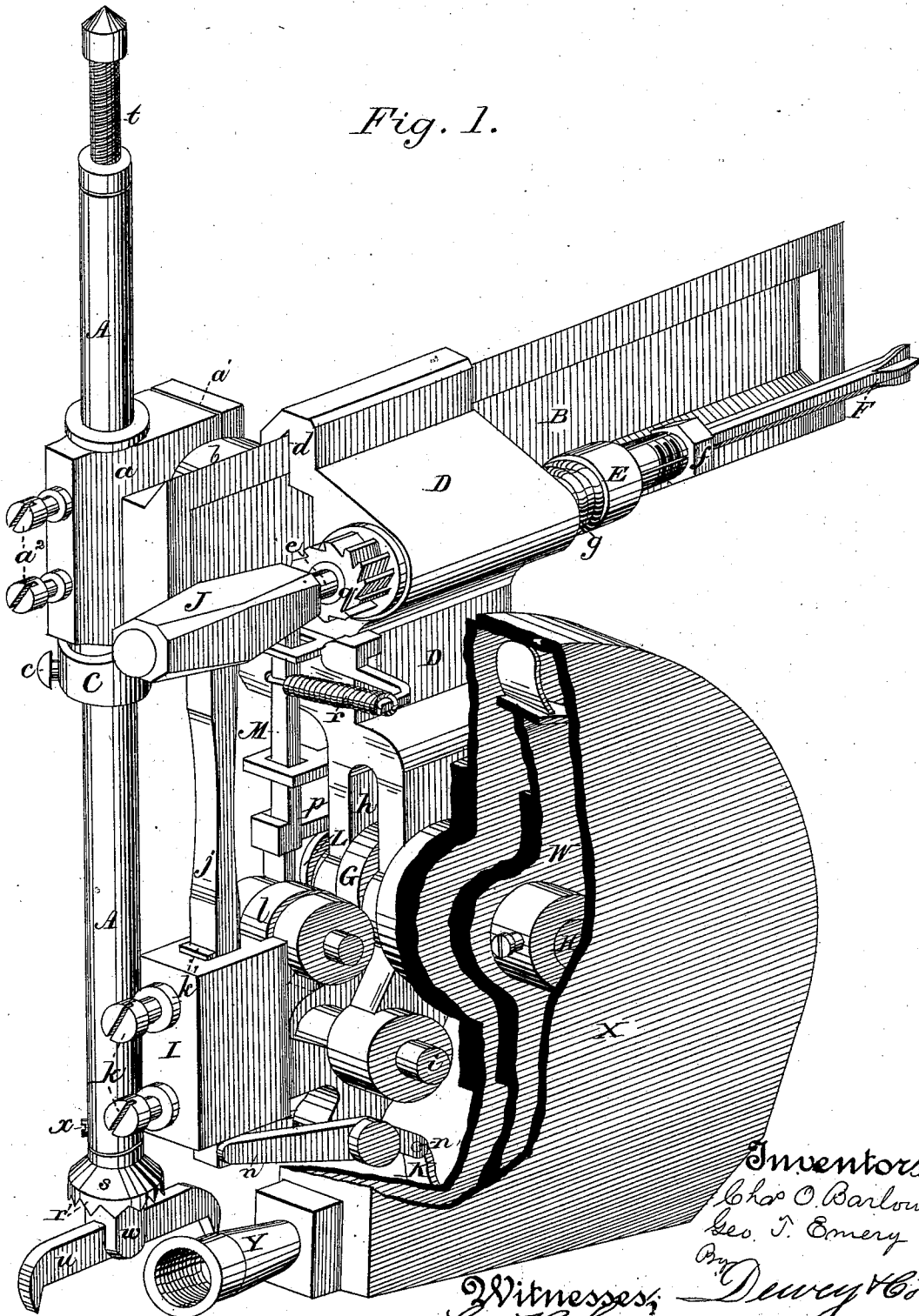
3 Sheets—Sheet 1.

C. O. BARLOW & G. T. EMERY.
ROCK DRILL.

No. 294,430.

Patented Mar. 4, 1884.

Fig. 1.



Inventors,
C. O. Barlow
Geo. T. Emery
By *Dewey & Co.*
Attorneys

Witnesses,
Geo. H. Strong
Forrourse

(No Model.)

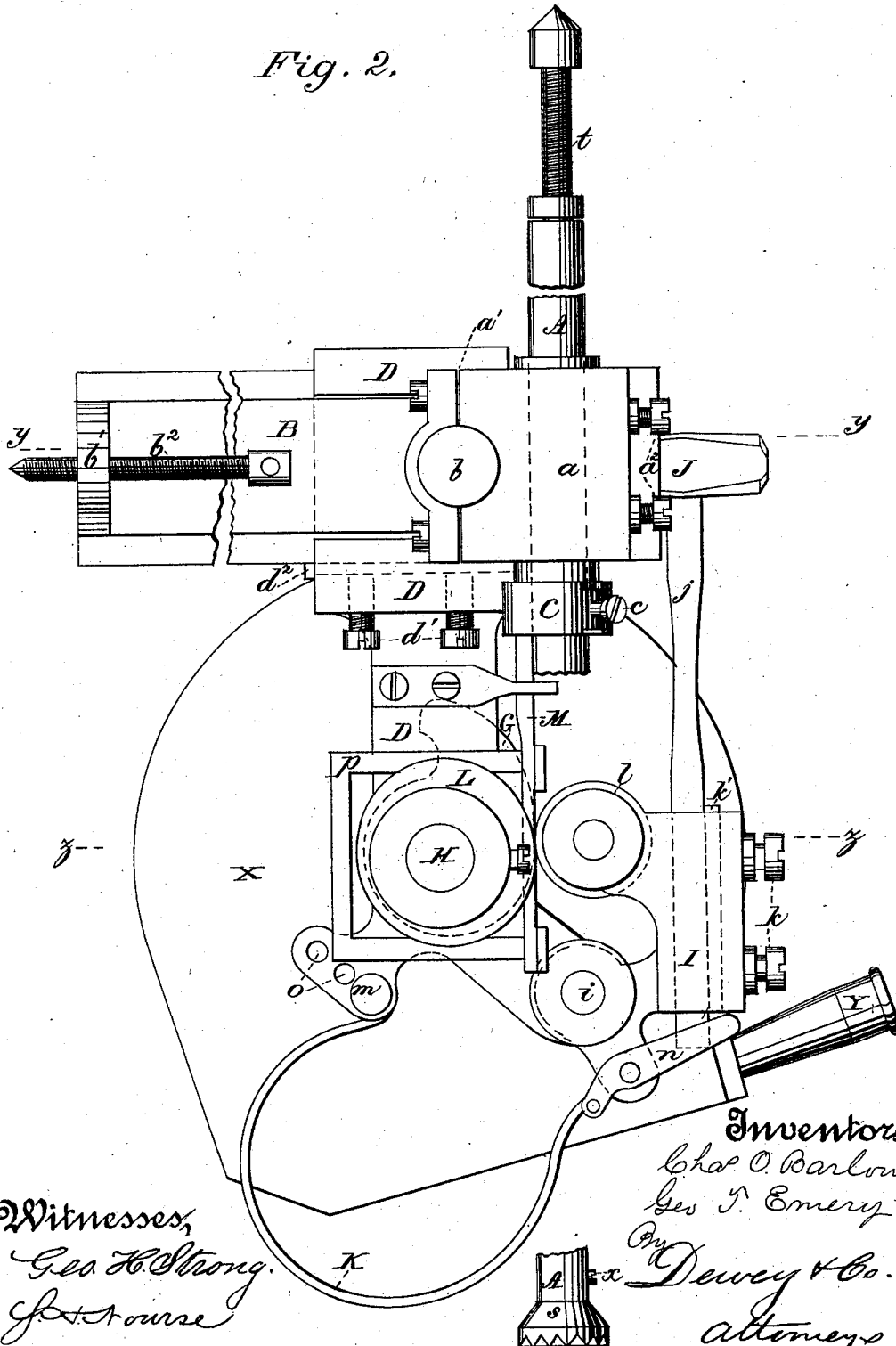
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Fig. 2.



(No Model.)

3 Sheets—Sheet 3.

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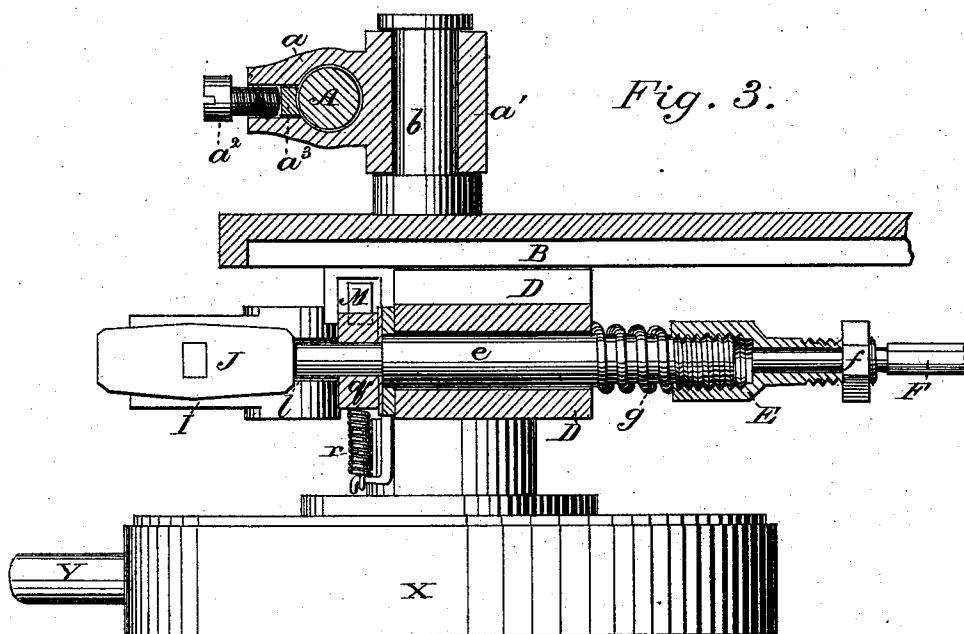
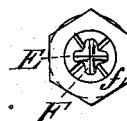
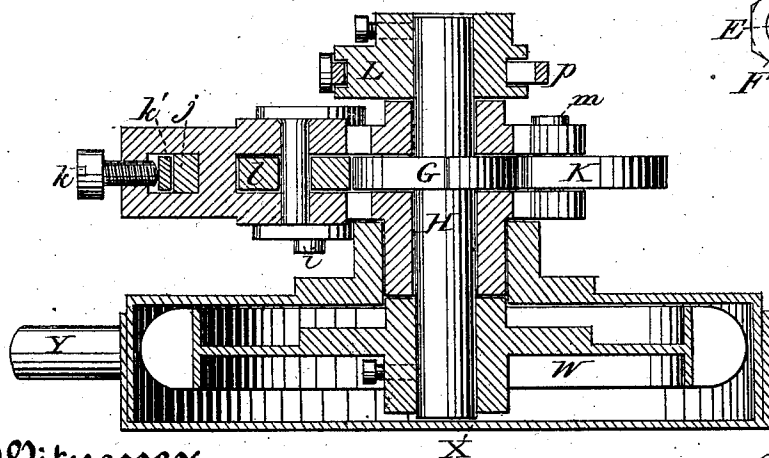


Fig. 3.

Fig. 4.

Fig. 5.



Witnesses,
Geo. H. Strong
J. H. Hourse

Inventors,
Chas. O. Barlow
Geo. T. Emery
Dewey & Co
Attorneys

UNITED STATES PATENT OFFICE.

CHARLES O. BARLOW, OF NEVADA CITY, AND GEORGE T. EMERY, OF SAN FRANCISCO, ASSIGNORS OF ONE-FOURTH TO JOSEPH W. SPRAGUE, OF NEVADA CITY, CALIFORNIA.

ROCK-DRILL.

SPECIFICATION forming part of Letters Patent No. 294,430, dated March 4, 1884.

Application filed February 27, 1883. (No model.)

To all whom it may concern:

Be it known that we, CHARLES O. BARLOW, of Nevada City, Nevada county, State of California, and GEORGE T. EMERY, of the city and county of San Francisco, State of California, have invented an Improved Rock-Drill; and we hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to a new and useful rock-drill; and it consists in a body-bar carrying the power mechanism, the drill, the hammer, and the means for operating said hammer and rotating the drill, said bar being suspended from and adapted to slide upon a cross-bar which is attached to a supporting-column in such a manner as to have a vertical, horizontal, and inclined adjustment.

The particular and novel construction of the parts and of certain details of the column, together with the operation of the device, will hereinafter fully appear, reference being made to the accompanying drawings, in which—

Figure 1, Sheet 1, is a perspective view of our rock-drill, with a portion of the water-wheel W and a portion of its casing broken away, in order to more fully show the important features of our invention. Fig. 2, Sheet 2, is a rear elevation, with the lower portion of the column A broken away. Fig. 3, Sheet 3, is a horizontal section on the line *y y*, Fig. 2. Fig. 4 is a horizontal section on the line *z z*, Fig. 2. Fig. 5 is a front view of the drill F, nut *f*, and chuck E, showing the slots in the latter.

The object of our invention is to furnish an efficient and rapid means for drilling rock.

A represents the supporting-column.

B is a cross-bar, having a trunnion, *b*, journaled in a bearing or box, *a*, formed in a sleeve, *a*, fitted upon the column A, Fig. 3. The box *a* is formed by fitting and screwing a cap to a corresponding portion opposite, and by properly regulating the screws the cross-bar B may be turned and held at any angle without moving the column, Figs. 1, 2. The sleeve *a* is secured upon the column by means of set-screws *a*² and a suitable gib, *a*³, whereby said sleeve may be moved up or down and the cross-bar vertically adjusted, Fig. 3. A collar, C, set by a screw, *c*, is fitted upon the column under the sleeve for additional security, Figs. 1, 2.

Upon the front of the cross-bar B is an ear or projection, *b*¹, through which a sharp-pointed screw, *b*², operates to steady the device against the face of the rock, Fig. 2.

D represents a bar forming the body of the device. It is formed with a grooved cross-head, *d*, adapted to fit upon the cross-bar B, whereby it is suspended, Fig. 1. The upper edge of the cross-bar is beveled, and its lower edge provided with a straight flange or tongue, and the cross-head *d* is correspondingly made to fit these edges, whereby it may readily be adjusted in the direction of the length of the cross-bar. The cross-head is set upon the bar by means of set-screws *d*¹ underneath and a suitable gib, *d*², Fig. 2. By means of these it may be tightened upon the cross-bar, to suit whatever inclination it may be placed in, as will hereinafter appear. The upper portion of the body-bar D is formed with a socket-bearing in which the arbor or drill-holding spindle *e* is loosely fitted, Figs. 1, 3. This spindle projects at both ends, and is provided with screw-threads upon its forward end, to receive the chuck E, which is adapted to be screwed thereon, Fig. 3. This chuck consists of a tube the rear end of which is inwardly threaded, to adapt it for screwing upon the arbor or spindle *e*. Its forward end is tapered and externally threaded. It is also slotted, as shown, into quarters, Figs. 3 and 5.

F is the drill. This is fitted into the slotted end of the chuck E, and a nut, *f*, is screwed upon said end, whereby because of its tapering shape and slots it is contracted upon and binds the drill securely, Figs. 1, 3, 5. A spring, *g*, is fitted upon the spindle between the rear end of the chuck E and the front of the body-bar, whereby the drill is always held to its place in the base of the hole. The lower end of the main or body bar is slotted at *h* to receive a cam, G, keyed upon the main driving-shaft H, mounted in the bar and projecting on both sides, Figs. 1, 4.

To the lower end of the body-bar, which is projected to one side for the purpose, is hinged upon a shaft, *i*, the hammer-holder I, consisting of a block having a socket through which the handle *j* of the hammer J fits, and is secured by set-screws *k* and a gib, *k*¹, Figs. 1, 2. The hammer J is an ordinary sledge, which,

by reason of the hinged holder, in which its handle is secured, may be adapted to oscillate and deliver its blow upon the rear end or head of the arbor or drill-holding spindle *e*, Fig. 1. This oscillation is occasioned by means of the cam *G*, which impinges against a roller, *l*, journaled in the top front of the hammer-holder *I*, whereby the hammer is forced back and suddenly relieved, and by means of a strong curved spring, *K*, secured to a bolt, *m*, fitted in the forward lower end of the body-bar *D*, and to an arm, *n*, secured to the lower or under side of the hammer-holder, whereby the hammer, when relieved from the cam, is forced to deliver its blow, Fig. 2. The forcing back of the hammer-holder by the cam *G* compresses the spring *K*, which in turn throws the holder forward and causes the blow of the hammer. The bolt *m*, upon which one end of the spring *K* is secured, may be fitted to any of a series of holes, *o*, in order to regulate the tension of said spring, Fig. 2. The following means insure the rotation of the drill after each blow. The projecting end of the driving-shaft *H* carries an eccentric, *L*, upon which is fitted a strap, *p*, Figs. 2, 4. This strap is secured to a vertical pawl-bar, *M*, suitably guided and engaging with a ratchet, *q*, keyed upon the rear end of the arbor or drill-holding spindle *e*, Fig. 1. A small spring, *r*, holds said pawl-bar in engagement with the ratchet, Fig. 1. The eccentric *L* is so arranged that the moment the hammer has delivered its blow it will elevate the pawl-bar *M*, which, engaging under the ratchet-teeth, turns said ratchet and rotates the spindle *e* and drill *F*. In descending it slips over the teeth.

The lower end of the column *A* is provided with a flange, *s*, having a concaved lower face and corrugated or provided with teeth *r'*, and its upper end has fitted in it a sharp-pointed screw, *t*, Figs. 1, 2. The adjustment of this screw fits the column tightly to a beam or support above, and the tooth-flange *s* adapts it to take hold of any wooden foundation. When such support is not convenient, we have a crow-foot, *u*, pivoted in a slotted bearing, *w*, having a shank or stem. This is adapted to fit up into the column, and to be secured by a screw, *x*, Fig. 1.

This device is adapted to find a good hold in rock, and by setting the screw with desired tightness the column may move on its foot to change the inclination of the drill above.

We operate this drill by any suitable power. We have here shown a water-wheel, *W*, having buckets on its rim, said wheel being of that class known locally as "hurdy-gurdy" water-wheels, Figs. 1, 4. This wheel is keyed upon the driving-shaft, and is inclosed in a

casing, *X*, having a bottom aperture for the escape of the water, Figs. 1, 2, 3, and 4. *Y* is the nozzle entering the casing, and adapted to discharge water under pressure against the buckets. We do not confine ourselves to this particular power for driving the drill, for we may use a rotary or oscillating engine or any other suitable contrivance. The cross-head *d* of the body-bar *D* is to be secured upon the cross-bar only with sufficient force to prevent it from slipping, no matter to what inclination it may be turned. The vigorous and rapid blows of the hammer will advance the drill into the hole by jarring the cross-head forward on its bar. In this advancement the body-bar *D* carries with it all the mechanism, including the water-wheel, which is attached to it, and thus the device may be continuously operated without further adjustment.

We are aware that in rock-drills a column has been used, from which the several parts of the drill have been suspended, and also a hammer actuated by a spring and cam, and such we do not wish to be understood as claiming, broadly, as of our invention.

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

1. In a rock-drill, the supporting-column *A*, the cross-bar *B*, and connecting means, substantially as described, whereby the cross-bar is adapted to be adjusted vertically and to any desired inclination, in combination with the body-bar *D* and cross-head *d*, for suspending the body-bar from the cross-bar, the arbor or drill-holding spindle *e*, the hammer-holder *I*, hinged to the base of the body-bar, and having roller *l* in its front, the hammer *J*, having handle *j*, secured in the holder, and the means for oscillating said hammer-holder, consisting of the spring *K*, the cam *G*, and shaft *H*, the several parts arranged to operate substantially as herein shown and described.

2. In a rock-drill, the column *A*, cross-bar *B*, and means whereby said bar is adapted to be adjusted vertically and to any desired inclination, and trunnion *b*, journaled in a box, *a'*, in combination with the sharp-pointed screw *t* in its top, the collar *C*, set by a screw, *c*, the corrugated flange *s*, and the removable swiveled crow-foot *u* at its bottom, substantially as and for the purpose herein shown and described.

In witness whereof we hereunto set our hands.

CHARLES O. BARLOW.
GEO. T. EMERY.

Witnesses:

W. D. LONG,
JOHN LAWRENCE.