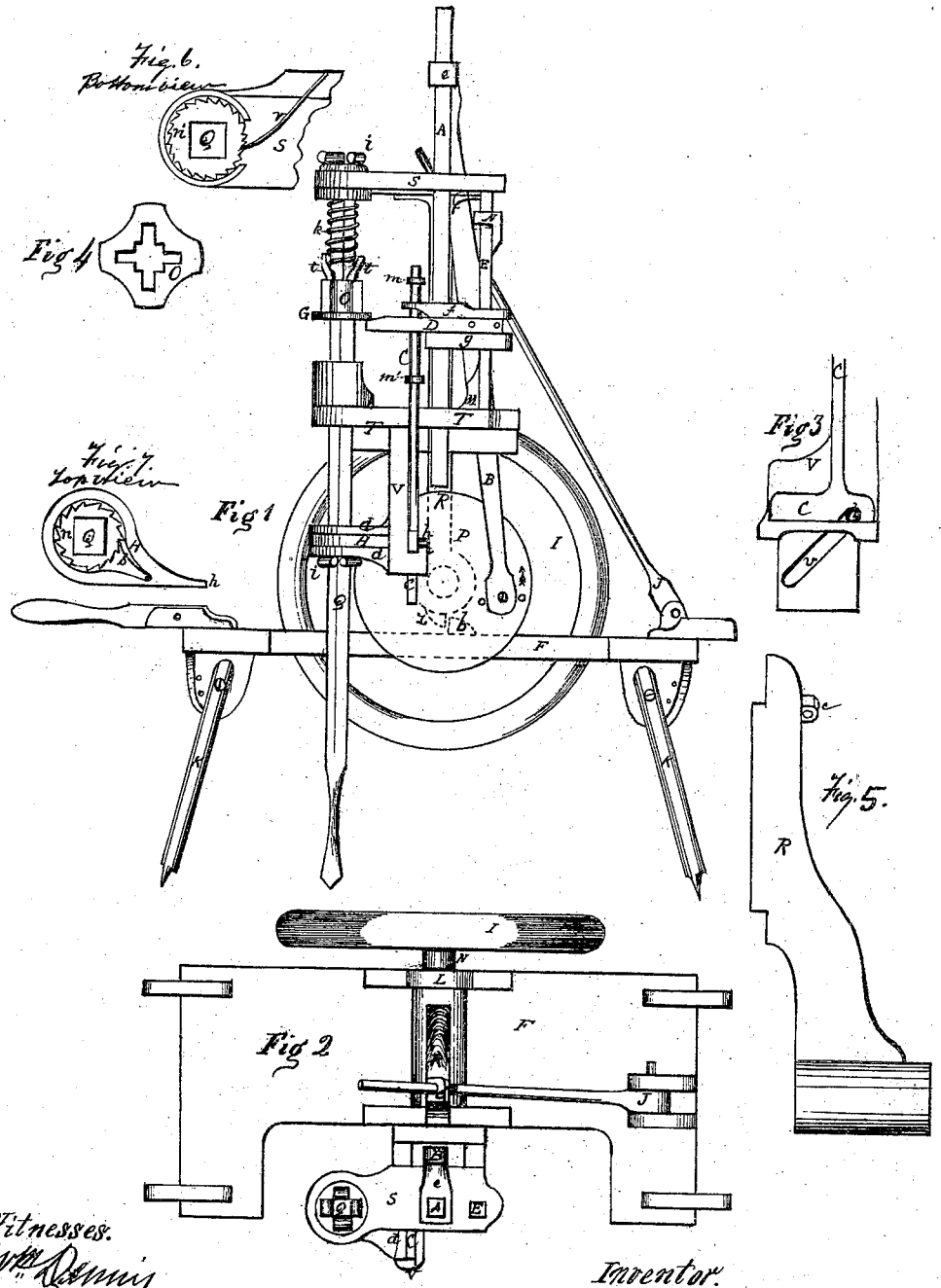
G. B. Phillips,

2. Sheets. Sheet. 1.

Rock-Drill.

No. 113,203. Patented Mar. 28. 1871.



Witnesses.

Wm. Dennis

Robert T. Frey

Inventor.

George B. Phillips

By his Atty. J. Dennis Jr.

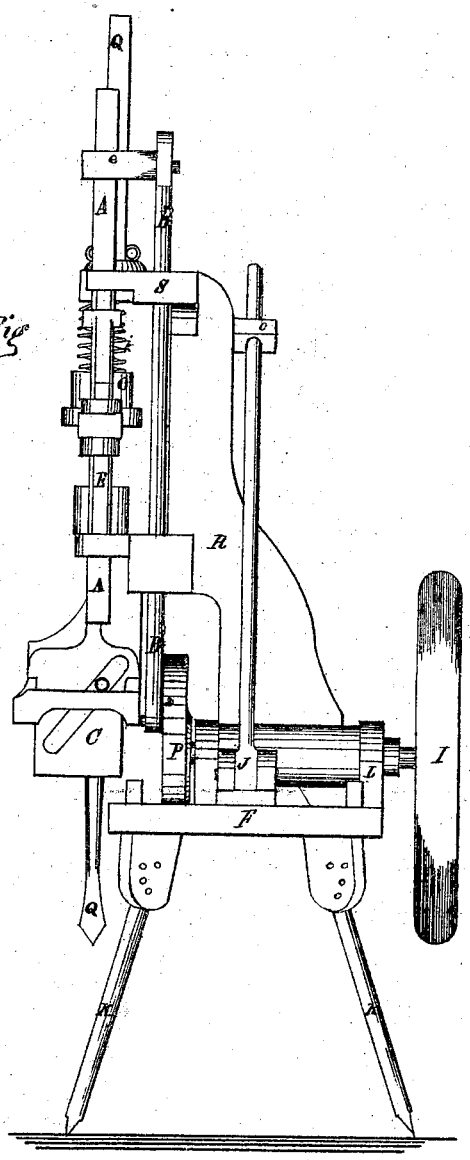
G. B. Phillips,

2. Sheets, Sheet 2.

Rock Drill.

No. 113,203. Patented Mar. 28. 1871.

Fig



Witnesses.

Wm. H. Canaan

Jacob Bond

Inventor

George B. Phillips

By his Atty J. Dennis, Jr.

United States Patent Office.

GEORGE B. PHILLIPS, OF POUGHKEEPSIE, NEW YORK, ASSIGNOR TO HIMSELF, ADRIAN M. CORNELL, AND JAMES V. HARBOTTLE, OF SAME PLACE.

Letters Patent No. 113,203, dated March 28, 1871.

IMPROVEMENT IN ROCK-DRILLS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, GEORGE B. PHILLIPS, of Poughkeepsie, Dutchess county, in the State of New York, have invented certain new and useful Improvements in Rock-Drills; and I hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawing forming part of this specification.

The nature or essence of my invention consists in providing and combining several devices for the purpose of operating a rock-drill, and adjusting its position and the working of its different parts, as will be fully set forth below.

In the drawing hereinbefore mentioned—

Figure 1 is a front elevation of a drill with my improvements.

Figure 2 is a top view of the same.

Figures 3, 4, 5, 6, and 7 show the particular parts indicated by the letters upon them.

The frame or table F is supported on legs, K, and has fastened upon it the boxes L, in which turns the shaft of the fly-wheel I and the face-plate P, which shaft may be turned by a belt on the pulley N, or by a crank-handle inserted in the wheel I, or otherwise.

Upon this shaft, between the boxes L, I arrange the main standard R, the shaft passing through it.

This standard, which supports and holds the mechanism for operating the drill, has a projection or lug, *z*, on its under side, beneath the shaft, which, striking the stop *b* on the table F, prevents the standard from inclining to the left, while its inclination to the right, as circumstances may require, is secured by means of the brace J sliding in the block *c*, attached to the top of the standard.

Upon the standard R are secured the upper guiding plate S and the lower guiding plate T, the latter holding, on its under side, the standard V, supporting on one side the drill-guides *d d*, and on the other a guide for the sliding rod, C.

A wrist-pin on the plate P operates the connecting-rod B, pivoted on an arm, *e*, projecting from the sliding bar A, which has secured upon it the two lifting-arms *f* and *g*, between which slides the lifting-bar D.

The angular drill-stock Q passes through cylinders held by the plate S and by the guides *d;* and the bar E, extending from S to T, has, on its opposite sides, the beveled blocks M and N, which pass through slots provided for that purpose in *f* and *g*, so as to enter a corresponding slot in the bar D.

To operate the drill, the wheel I is turned by hand or other power, carrying with it the plate P, on the same shaft; and this plate, through the connecting-rod B, traverses the sliding bar A, so as to raise and depress alternately the bar D, which slides endwise between the plates *f* and *g*, slots being provided in it for the rod C and the bars A and E to traverse in.

As shown in the drawing, the bar D projects beneath the lifting-plate G, fitted loosely on the stock Q, but, being acted on by the bar D only at one edge, it raises the stock Q by the friction thus produced; but when, by the further turning of the plate P, the bar D is raised high enough to cause the block N to enter the slot in its rear end, it is then drawn back thereby, and the stock and the plate G are released and allowed to fall.

To make the stock and drill descend more promptly and with greater force, a block, O, is placed above the plate G, containing four pivoted griping levers, *t*, or one for each side of the stocks, their lower ends pressing against and their projecting upper ends being inclined from the stock, so that when the coils of the spring *k* are crowded down within these upper arms by the rising of the block and consequent compression of the spring, the lower arms press more and more against the stock Q. When, therefore, the bar D releases the stock, the spring *k*, acting against the block O, impels it downward, at first with great force, the action of the spring and of the griping-levers gradually relaxing together, so as to allow the drill to strike the rock free.

The sliding rod C widens at its lower part, which has in it the oblique slot *v*, to receive the pin *h* projecting from the turning-plate H, and is provided with the stops *m* and *m'*, by means of which it is alternately raised and depressed, so as to vibrate the plate H.

The stock Q passes through two ratchets, *n* and *n'*, the former being held in the guides *d* and the latter in the plate *s*, and both provided with ratchets and pawls, the pawl *r* of the upper ratchet being fastened to the plate S, and the pawls *s* of the lower one to the plate H, so that when this plate is vibrated, as just described, the ratchet *n*, and with it the stock and drill, are turned step by step, the ratchet and pawl in the plate S holding it as far as turned, and preventing its return.

By adjusting the stops on the rod C the length of the steps by which it is turned may be shortened or lengthened, at pleasure, or, in other words, the pawl may be made to pass one, two, or more teeth of the ratchet at each stroke, as required.

To reduce friction, the rollers *i i* are applied at the different sides of the stock Q.

It is obvious that the blocks M and N may be made adjustable, so as to push forward and draw backward the bar D, at such points as the adjustment of other parts or the desired distance of fall for the drill may

require, the plate P having holes at different distances from its center, in order to vary the length of the vibrations of the bar A.

What I claim is—

1. The combination and arrangement of the wheel I, plate P, standard R, braces J, projection *z*, and stop *b*, substantially as described.

2. The combination of the sliding bar A, plates *f* and *g*, lifting-bar D, and fixed bar E, provided with the beveled blocks M and N, arranged to operate substantially as described.

3. In combination with the drill-rod Q, the ratchet-wheels *n* and *n'*, provided with pawls *r* and *s*, vibrating-plate H, sliding rod C, provided with oblique slot *v* and stops *m* and *m'*, all substantially as described, for the purposes set forth.

In testimony whereof I have hereunto subscribed my name as inventor.

GEORGE B. PHILLIPS.

Witnesses:

DANIEL W. GUERNSEY,

EVAN WILLIAMS.