N. W. ROBINSON.

Improvement in Rock Drilling-Machines.

No. 115,641. Patented June 6, 1871.

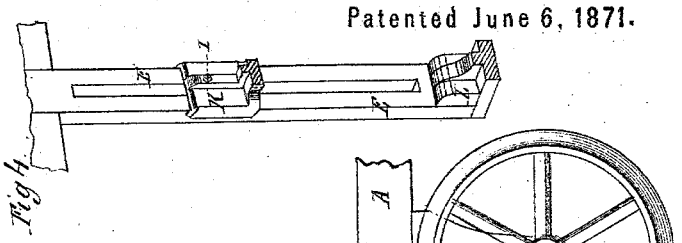

Fig. 4.

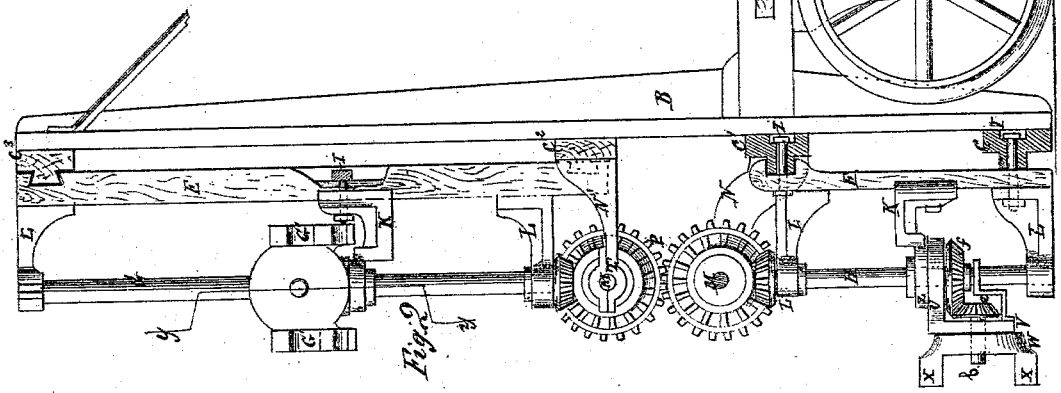

Fig. 2.

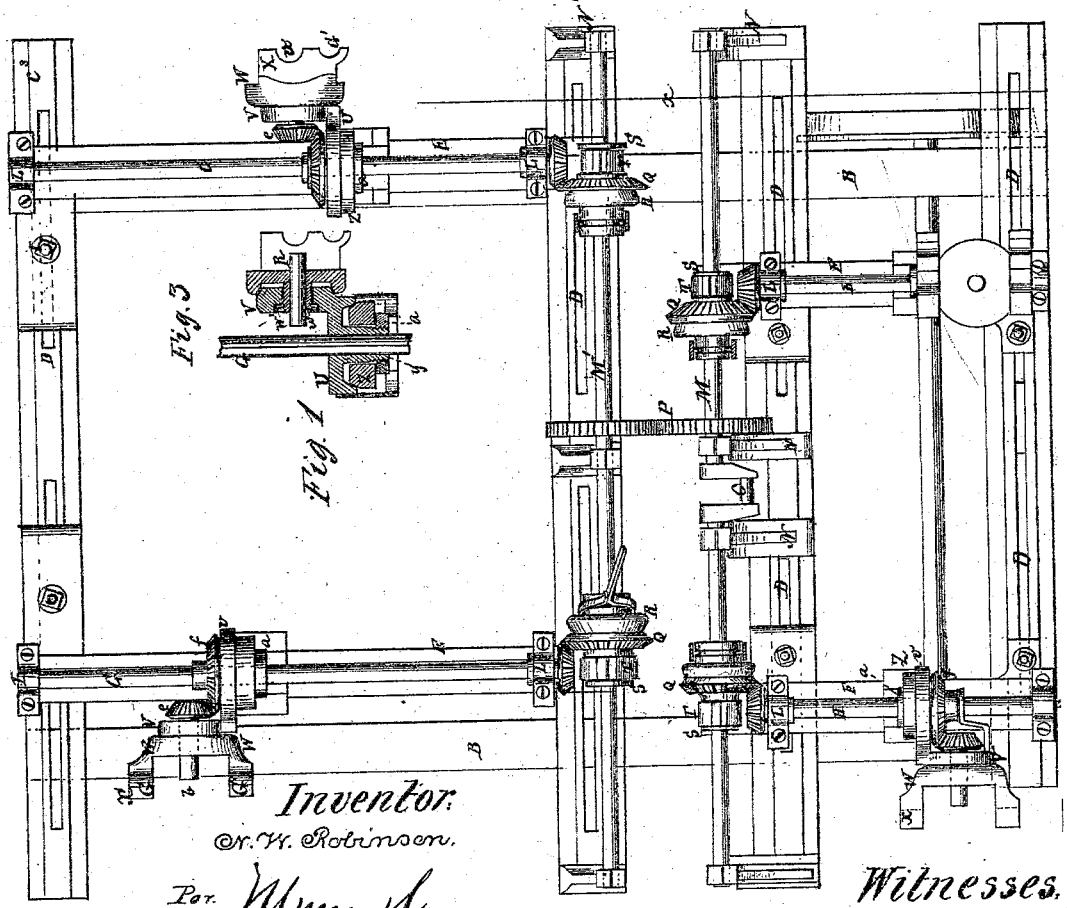

Fig. 3.

Fig. 1.

Inventor.
N. W. Robinson.
Per. Munn & Co
Attorneys.

Witnesses.
A. Y. Almquist
Wm. H. C. Smith.

UNITED STATES PATENT OFFICE.

NORMAN W. ROBINSON, OF BURLINGTON, VERMONT.

IMPROVEMENT IN ROCK-DRILLING MACHINES.

Specification forming part of Letters Patent No. 115,641, dated June 6, 1871.

To all whom it may concern:

Be it known that I, NORMAN W. ROBINSON, of Burlington, in the county of Chittenden and State of Vermont, have invented a new and Improved Rock-Drill; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to improvements in machines for drilling rock for tunneling and other purposes; and it consists in an arrangement of adjusting-supports on a vertical frame upon one end of a truck, for shifting the drills and operating gears vertically and horizontally, the machine having four sets of drill-supports and four drills. The invention also consists in certain novel swivel-heads, in which the drills work, and by which they are mounted on the said adjusting-supports, and by which also the drills may be pointed and held in any direction, each independent of the other.

Figure 1 is a front elevation of my improved drilling-machine. Fig. 2 is a section of Fig. 1 on the line *x x*. Fig. 3 is a section through one of the swivel-heads. Fig. 4 is a view, in perspective, of one of the slotted vertical supports for a bracket.

Similar letters of reference indicate corresponding parts.

A is the truck-frame, on the end of which are two strong posts, B, extending from the ground, or thereabout, as high as may be required. C C^1 C^2 C^3 represent four slotted cross-bars, extending from one to the other of these posts, and firmly attached thereto—one at the lower ends, another at the upper ends, and two at intermediate points. They have ways D, upon which vertical supports E F, for the brackets of the driving-shafts G H, and the swivel-heads, are clamped by the bolts I, for adjustment toward or from the center of the vertical frame. These vertical supports E F are also slotted vertically for adjusting the brackets K up and down. The brackets L for the shafts G H are permanently attached. M M′ represent driving-shafts mounted horizontally in brackets N N′ on the bars C^1 C^2, C^2, respectively, one of which shafts, M, has a crank, O, for the application of the power, and the other, M′, being connected to M by gears P. Each shaft has two bevel-wheels, Q, for driving the shafts G H, which wheels are capable of sliding on the said shafts and turn loosely, except when clutched by the friction-clutches R, which also slide on shafts M M′. The hubs S of these wheels work in arms T of the brackets N N′ of the adjustable supports E F, so as to be moved along said shafts when the supports are moved to shift the drills. The clutches R have hand-levers for connecting or disconnecting them with the wheels. The swivel-heads, on which the drills are mounted, consist of the angle-plates U V and W X, the parts U having a tubular projection, Y, extending through the plates Z of the brackets K, with the shafts G H passing through them, so that they may swing horizontally around said shafts; and they are secured in any required position by clamp-nuts *a*, screwing up against the plates Z, which have conical rims on the upper sides fitting on conical recesses in the parts U so as to bind when clamped together; and the parts W X are mounted on the plates V, so as to turn vertically on the axis of the shaft *b*, for gearing with the drill. The said short shafts are turned by bevel-wheels *e f*—the latter on shafts G H—and sliding up and down with the brackets K. The plates W are provided with tubular projections *w*, through plates V and clamping-nuts W′, to clamp V and W together to oscillate and hold the drills in any required inclination. The bearings G′ in plates X are for reception of the drill feed-rod, which is of the ordinary construction, and not, therefore, shown.

It will be seen that, by these arrangements, a simple and efficient means of adjusting the drills to work so that any part of the work in front of the machine, or at considerable distances at either side, may be reached, and that the drills may be worked at any angle, either vertically or horizontally. It will also be seen that, if it be required to take out a drill and put in another, the swivel-head may be swung around away from the work to a convenient position for the purpose, and that the change may be effected without moving the truck. In this respect my invention has a special advantage over those now in use.

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

1. The vertical slotted supports E F, mounted on the horizontal slotted bars for lateral adjustment, the vertical driving-shafts and gears thereon, the vertically-adjustable brackets K, the brackets L, and the wheels Q, all combined and arranged for horizontal and vertical adjustment of the drills, substantially as specified.

2. The combination, with the vertically-adjustable brackets K and shafts G H, and the laterally-adjustable supports E F, of the vertically and horizontally oscillating swivel-supports for the drill-rods, constructed and arranged substantially as specified.

3. The swivel-supports U V W X, constructed and arranged for supporting the drills on the brackets K, oscillating them vertically and horizontally, and clamping them thereto, all substantially as specified.

NORMAN W. ROBINSON.

Witnesses:
D. B. HINCKLEY,
DANIEL E. HAYES.