N. NILSON.

Improvement in Machines for Drilling Rocks.

No. 132,019. Patented Oct. 8, 1872.

Fig. 1

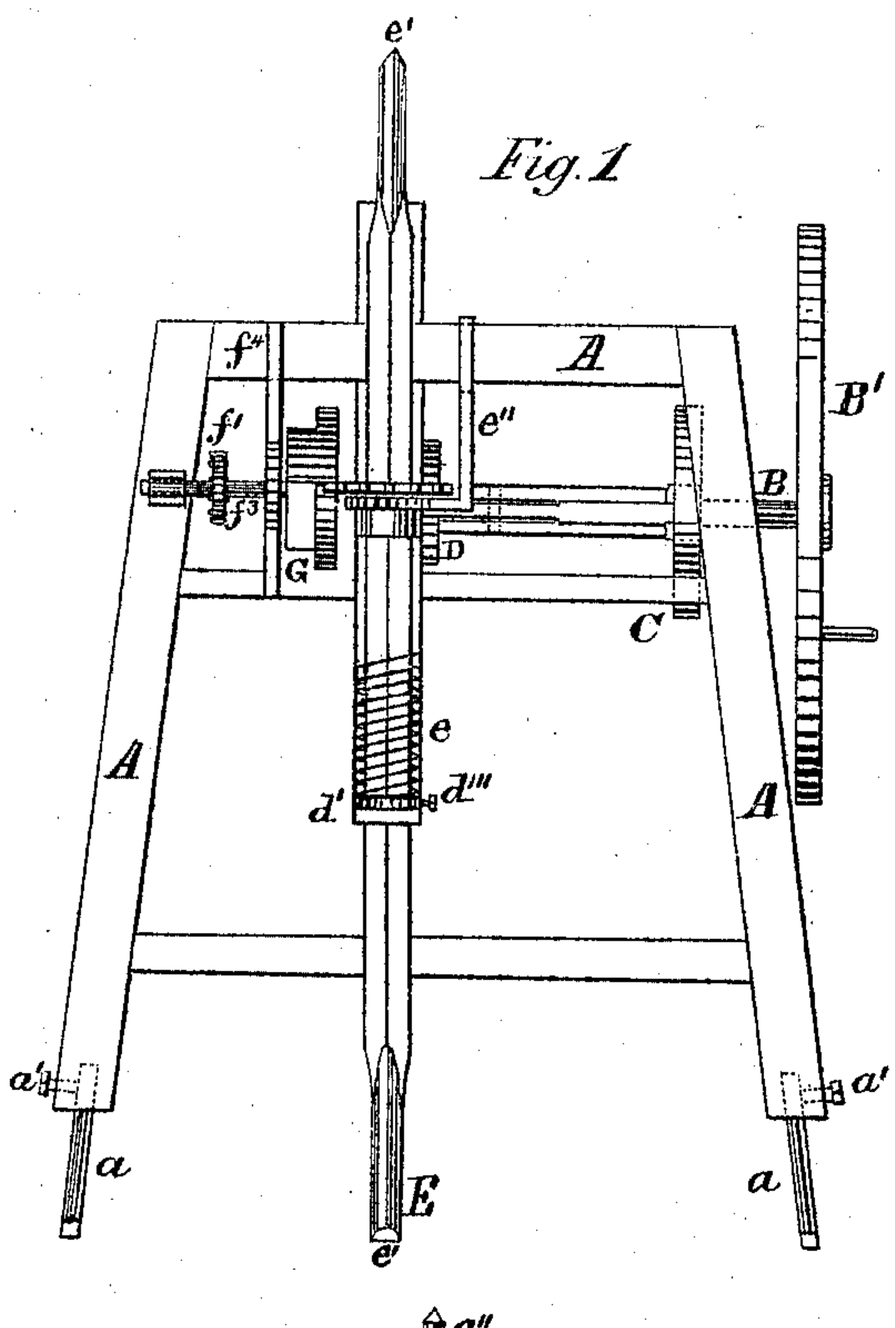

Fig. 2

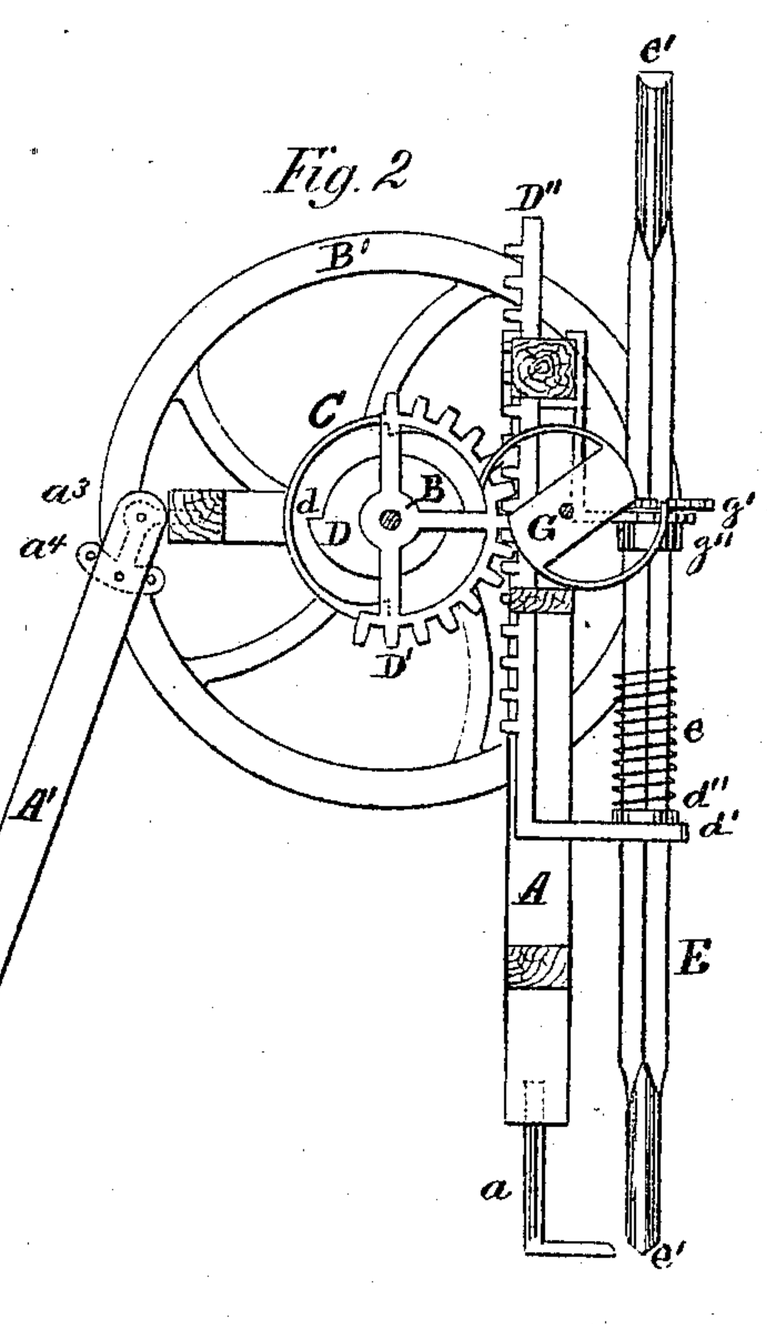

Fig. 3

Fig. 4

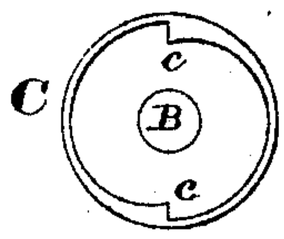

Fig 5

WITNESSES:

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atty.

UNITED STATES PATENT OFFICE.

NILS NILSON, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO HIMSELF AND WILLIAM W. McNAIR, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR DRILLING ROCK.

Specification forming part of Letters Patent No. **132,019**, dated October 8, 1872.

To all whom it may concern:

Be it known that I, NILS NILSON, of Minneapolis, in the county of Hennepin, in the State of Minnesota, have made certain Improvements in Machines for Drilling Stone, of which the following is a specification:

The object of this invention is to introduce into use a machine for drilling stone that is simple in construction, durable, and that can be easily operated, and cheap; and it consists in the construction and arrangement of the actuating parts and their combination to effect the object aimed at, as will more fully hereinafter be described.

In the drawing, Figure 1 represents a front view of the machine; Fig. 2, a sectional, upright, and transverse view; Fig. 3, a top view; and Figs. 4 and 5, details of some of the parts.

A is the framing of the machine, which is of wood or other material. B is the main driving-shaft, transversely and horizontally across the machine. B′ is the crank-wheel, by which motion is communicated to revolve shaft B; or any kind of power can be attached to revolve the shaft B. *b b* are plates or lugs projecting from and fast to shaft B, and receive between them the lever *b′*, and to which plates the lever *b′* is pivoted with one end projecting some distance from the edge of said plates *b*. *b″* is a spring, one end secured to shaft B by band *b‴*, while the other end diverges and comes in contact with the lever *b′*. b^4 is a stud or guide attached to lever *b′*, and receives the spring in such manner as to guide it and always keep it in bearing position upon the lever *b′*. C is a flanged disk fast on the framing A, as seen in Figs. 1 and 3, and shaft B passes horizontally and centrally through and revolves within it. Upon the flange of said disk, as seen in Fig. 4, are notches *c c*. D is a cam or notched eccentric disk having notches *d d* on its perimeter, and is fast to a segmental spur or other gear wheel, D′, which is confined with the cam-disk D so as not to move longitudinally upon shaft B. D″ is an upright rack, with teeth on one side to gear into teeth on segmental wheel D′, and so attached to the framing as to freely slide up and down. At the lower end of toothed rack D″ is arm *d′*, at right angles with D″, and extends forward far enough to receive a reciprocating drill and lift and guide it in its reciprocations. E is the drill, made of steel or other proper metal, with the cutting-points *e′*. *e* is a spiral spring around the body of drill E, and loose thereon. *d″* is an adjustable nut, made fast, and can be adjusted to any height on the drill by a holding-screw, *d‴*, passing through the nut and bearing against the body of the drill, and by the adjustment of this nut the force of the spring is controlled. *f* is a toothed wheel, fast on shaft B, and revolves with it. *f′* is a similar wheel, fast on shaft *f‴*, while *f″* is a chain going around wheels *f* and *f′*, the teeth of which gear into the links of chain *f″*, and cause the shaft *f‴* to revolve whenever shaft B is revolved. G is a cam-wheel, fast on and revolving with shaft *f‴*, and has circular eccentric arms *g g* thereon, which, as they revolve, take hold of the teeth in wheel *g* that is around the body of the drill E, but allows the drill to slide freely through it; but as the wheel *g′* revolves it will revolve the drill one-fourth round, or as far as one of the arms *g* will turn the wheel *g′* by taking hold of a single tooth, and when the other arm *g* takes hold of the next tooth in wheel *g′* it will revolve the drill still another one-fourth round, and so continue. The distance at which the drill may be revolved can be changed to make the revolution irregular by having the teeth irregular in the wheel, and the arms *g* unlike in their revolution. *g″* is a hub, fast on wheel *g′*, and is held in position by the suspending-gallows *e″*, which is firmly attached to the framing, and has an arm extending horizontally to receive it. *a a* are adjustable feet in the lower or bottom ends of the posts of the frame A, and when adjusted to the right height are held by the holding-screw *a′*. These feet are bent at right angles for the purpose of placing weights, when necessary, upon the horizontal portions. A′ is a hinged brace-leg attached to the rear side of the framing, and assists in supporting as well as bracing the machine, and has a pointed bar, *a″*, at its bottom end to prevent slipping. a^3 is a metal bolt, fast in the framing, with a hole through it to pivot the leg A′ to, and upon the bolt-pin the leg A′ will freely turn, and at the point where the leg is pivoted the bolt drops at an angle, as seen in Fig. 2, in dotted lines, to form a guide, and has ad-

justing-holes in a segmental plate, a^4, by which the leg A′ is secured at any proper angle with relation to the machine that the surface of the ground may require, and, as all the feet of the machine are adjustable, the machine can be adjusted to stand firm upon uneven surfaces, and every leg support its proper portion, and the machine stand firm in its position.

By revolving shaft B the short arm of lever b' engages one of the notches on the eccentric disk D, and revolves it and the segmental wheel D′, which is in gear with rack D″, raises it, and with it the drill; as the drill rises the spring e is compressed; and as the long end of lever b' is revolved it is carried toward the shaft B by the eccentric on the flange of disk C until before it comes to one of the notches c, when the long end is depressed by the inclines, lifting the short end out of contact with the notch d on wheel D, and the drill falls with the force of its own weight and the force of the contracted spring e in addition. In order to revolve the drill so that it may not strike twice in the same place, as shaft B is revolved toothed wheel f, chain f'', and wheel f' on shaft f''' will revolve the eccentric G, the arms g of which will engage the teeth on wheel g' and revolve it the distance of a single tooth, by which means the drill will not fall twice in the same place, but is at every fall thrown into contact with the stone in a position to throw off or cut a portion of the stone within the diameter of its cut. Any number of these drills may be placed in line, so that at a single planting of the machine any number of holes can be drilled.

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

1. The shaft B, pivoted lever b', and disk C, in combination with the cam D, segmental toothed wheel D′, rack D″, and drill E, when constructed and arranged to operate as described.

2. The shaft B, toothed wheel f, chain f'', wheel f', shaft f''', and eccentric cam-wheel G, in combination with toothed wheel g' and drill E, constructed and arranged to operate as described.

3. A drilling-machine composed of the described devices for raising the drill and releasing it to fall with re-enforced effect, and for partially revolving the drill in one direction at each reciprocation, constructed and operating substantially in the manner set forth.

NILS NILSON.

Witnesses:
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