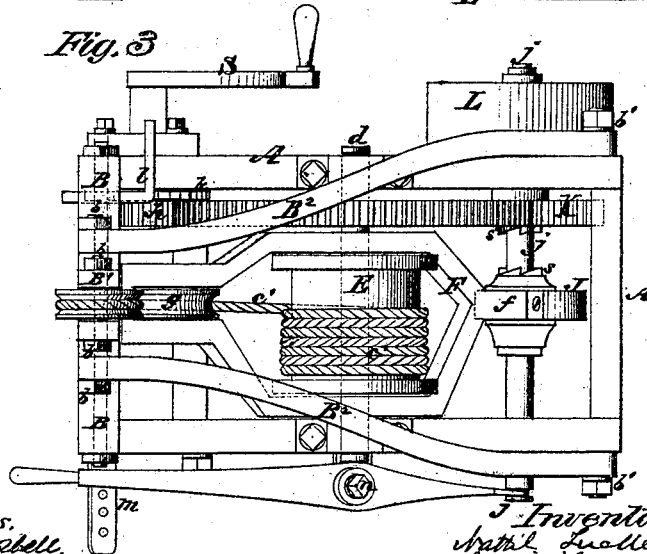
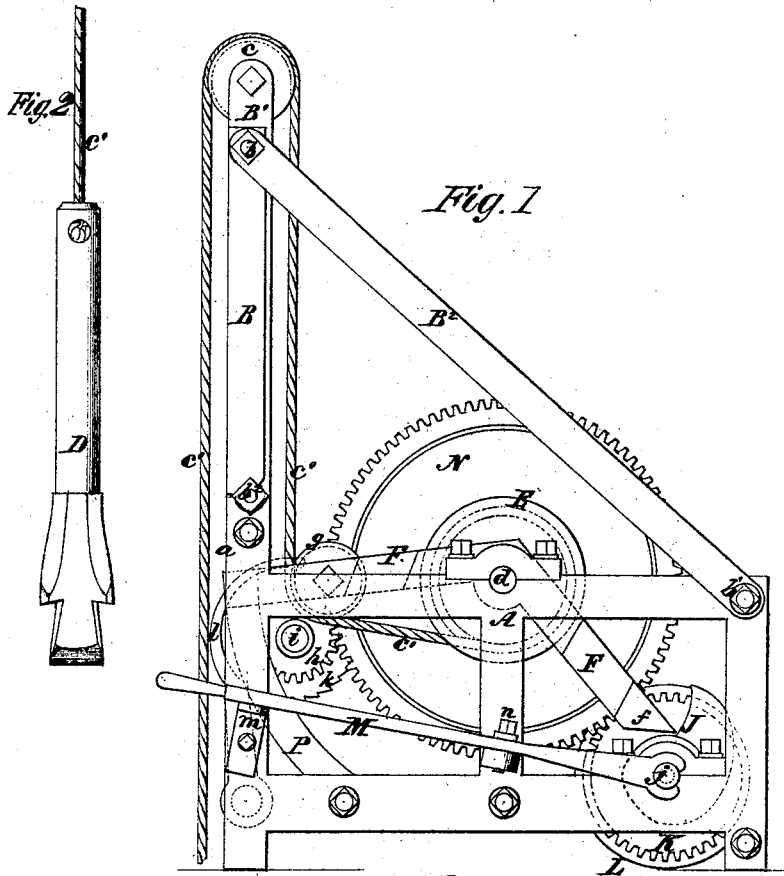


Tucker Williams & Coppock,

Rock Drill.

No. 109,158.

Patented Nov. 8, 1890.



Witnesses.
R. Campbell.
J. C. Campbell.

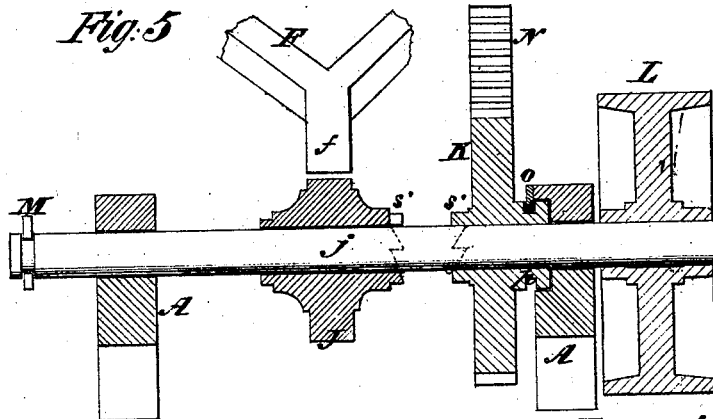
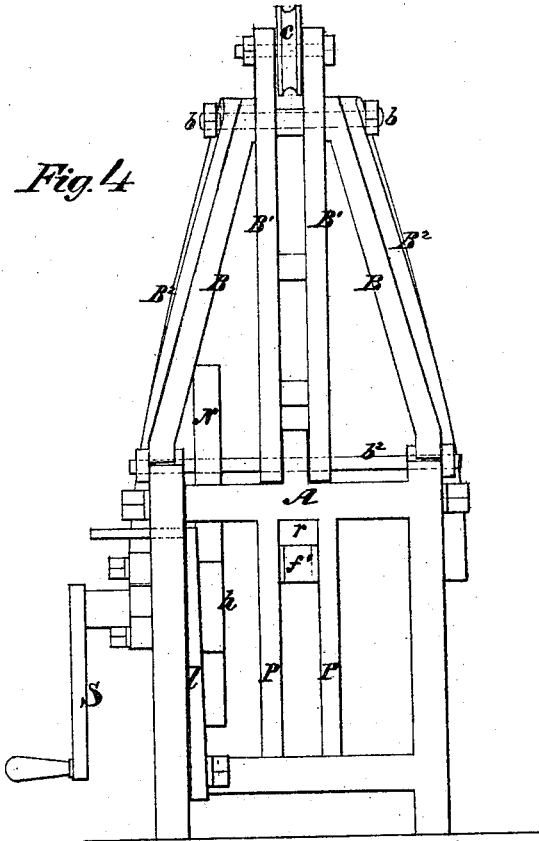
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Rock Drill.

No. 109/58.

Patented Nov. 8. 1870.



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PLEASANT HILL, OHIO.

Letters Patent No. 109,158, dated November 8, 1870.

IMPROVEMENT IN ROCK-DRILLING MACHINES.

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

To all whom it may concern:

Be it known that we, NATHANIEL TUCKER, LEVI WILLIAMS, and HENRY H. COPPOCK, all of Pleasant Hill, in the county of Miami and State of Ohio, have invented certain new and useful and useful Improvements in Machinery for Drilling Rock and other like substances; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1, plate 1, is an elevation of one side of the improved drilling-machine.

Figure 2, plate 1, shows one form of drilling-tool attached to a portion of the drill-rope.

Figure 3, plate 1, is a top view of the machine.

Figure 4, plate 2, is a front view of the machine.

Figure 5, plate 2, is a sectional view in detail of the shifting cam-shaft, and the parts immediately connected therewith.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements on machinery which is adapted for drilling into the earth.

It consists—

First, in the application of a folding frame to the main frame of the machine, for carrying at a considerable height above said main the pulley over which the drill-rope passes, said folding frame being so constructed that, when it is necessary to transport the machine from one place to another, it can be folded into a very small space.

Second, in the application to the shaft which carries the windlass or winding drum of the drill-rope, and which also carries a slow-speed spur-wheel, of a vibrating lever, one end of which carries a pulley, under which the drill-rope passes, and the other end or arm lies in such a position as to be acted upon by a cam or tappet, which is applied to a shifting-shaft, and which, at certain times, gives an intermittent vertical motion to the drill-rope, as will be hereinafter explained.

Third, in combining with the said drum-lever, slow-speed wheel, and cam or tappet, a shifting-lever and clutching-device, together with a pinion and belt-wheel, which latter wheels are the cam-shaft, whereby the operation of the cam on its lever can be stopped at pleasure, and at the same time the pinion on the cam-shaft be made to operate on the drum-shaft, and wind up the drill-rope, as will be hereinafter explained.

Fourth, in the application of an unwinding device to the slow-speed wheel, which can be operated either

to raise or to lower the drill, whether the machine be working or at rest, as will be hereinafter explained.

To enable others skilled in the art to understand our invention, we will describe its construction and operation.

In the accompanying drawing—

A represents a rectangular frame strengthened, braced, and otherwise adapted to contain and support the several parts constituting our improved drilling-machine.

At one end of this frame the vertical posts *a* are prolonged, and have pivoted to them at *b* two lateral inclined braces B B, which are connected at their upper ends to two standards, B' B'.

The same pivot-bolt *b*, which connects the braces B B to the frame A, also connects the lower ends of the said standards to this frame, as shown in fig. 4.

The two inclined braces B² B², which are secured at *b b'*, serve to sustain the frame B' B' in a vertical position. By removing these braces B² B² the said frame can be turned down upon top of the main frame A, out of the way, without detaching it from the latter.

The folding frame carries at its highest part a grooved pulley, *c*, over which the drill-rope *c* passes, and from which this rope with its drill D depends.

The rope *c* is passed beneath a grooved pulley, *g*, and thence to a flanged drum, E, around which the rope is wound.

The drum E is keyed on a horizontal shaft, *d*, which has its bearings in suitable boxes on top of the frame A. The pulley *g* is applied to a yoked or open lever, F, having its fulcrum on the shaft *d*, the front portion *f'* of which lever is guided between the two segments P P of frame A, at the upper terminus of which is a spring-block, *r*, for relieving shocks to the lever F when its front end rises suddenly.

The rear depressed portion of lever F terminates in a beveled extension, *f*, which is arranged over a cam-shaft, *j*, and at certain times is acted upon by a cam or tappet, J on said shaft.

The cam J is scroll-shaped, and gives quick vibrating movements to the lever F, which movements impart vertical motion to the drill-rope and drill. This cam J is keyed on the shaft *j*, on one end of which shaft a belt-wheel, L, is keyed. This belt-wheel receives rotary motion from any suitable prime mover, and transmits motion to the several parts of the machine.

The shaft *j* is allowed to receive an endwise movement, which can be given to it by a shifting-lever, M, whose fulcrum is at *n*. The shelf *m* for lever M is perforated, to receive a stop-pin, by which this lever can be fixed in the desired position.

On one end of the hub of cam J teeth *s* are formed,

which correspond to teeth *s'* on the hub of a pinion spur-wheel, *K*, and form a clutch for engaging this spur-wheel to the cam-shaft on which it is loosely applied.

The pinion *K* engages with the teeth of a large slow-speed wheel, *N*, which is keyed on the drum-shaft *d*, and, when the cam *J* is in position to operate upon the frame *F*, wheel *K* is not engaged with, nor will it turn with the cam-shaft; but, when this cam-shaft is moved by lever *M*, so that the teeth *s s'* become engaged, then pinion-wheel *K* will operate through wheel *N* to wind up the drill-rope on drum *E*. Endwise motion of the pinion-wheel *K*, is prevented by a stationary feather, *o*, which is received into a groove in the hub of said pinion, as shown in fig. 5.

For the purpose of unwinding the drill-rope, a pinion spur-wheel, *h*, applied on the shaft *i* of a hand-crank, *S*, is employed. In conjunction with this paying-out device a ratchet-wheel, *k*, on shaft *i*, and a pawl, *l*, applied to frame *A* are employed for preventing the drill from descending when it is not desired that it should do so.

It will be seen from the above description that, while the cam-shaft *d* is rotating, it can be shifted in the direction of its length, and cam *J* moved either beneath the lever *F*, or to one side thereof, in a position which will engage the pinion *K* with its shaft, and wind up the drill-rope. It will also be seen that when the cam *J* is acting upon the lever *F*, an attendant

can pay out the drill-rope and feed the drill down to its work as rapidly as the same progresses:

Having described our invention,

What we claim as new, and desire to secure by Letters Patent, is—

1. The drill-rope pulley *c*, applied to a frame, *B B'*, which is pivoted to the main frame *A*, in combination with the braces *B²*, substantially as described.

2. The lever *F*, constructed and arranged as described and shown, so that, while it occupies a place upon the shaft *d*, it does not interfere with the drum *E*, which is also on said shaft, said lever carrying the pulley *g*, and being operated by the cam *J*, all substantially in the manner set forth.

3. The cam or tappet *J*, keyed on the endwise adjustable shaft *j*, in combination with the loose spur-wheel *K*, clutch *s s'*, and fast drum *L*, and also in combination with the lever *F* and slow speed wheel *N*, substantially as described.

4. In combination with the slow-speed wheel *N*, and its pinion *K*, and the drum *E* and vibrating lever *F*, the paying-out device, substantially as described.

NATHANIEL TUCKER.
LEVI WILLIAMS.
HENRY H. COPPOCK.

Witnesses:

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J. K. TEETER.