

No. 639,836.

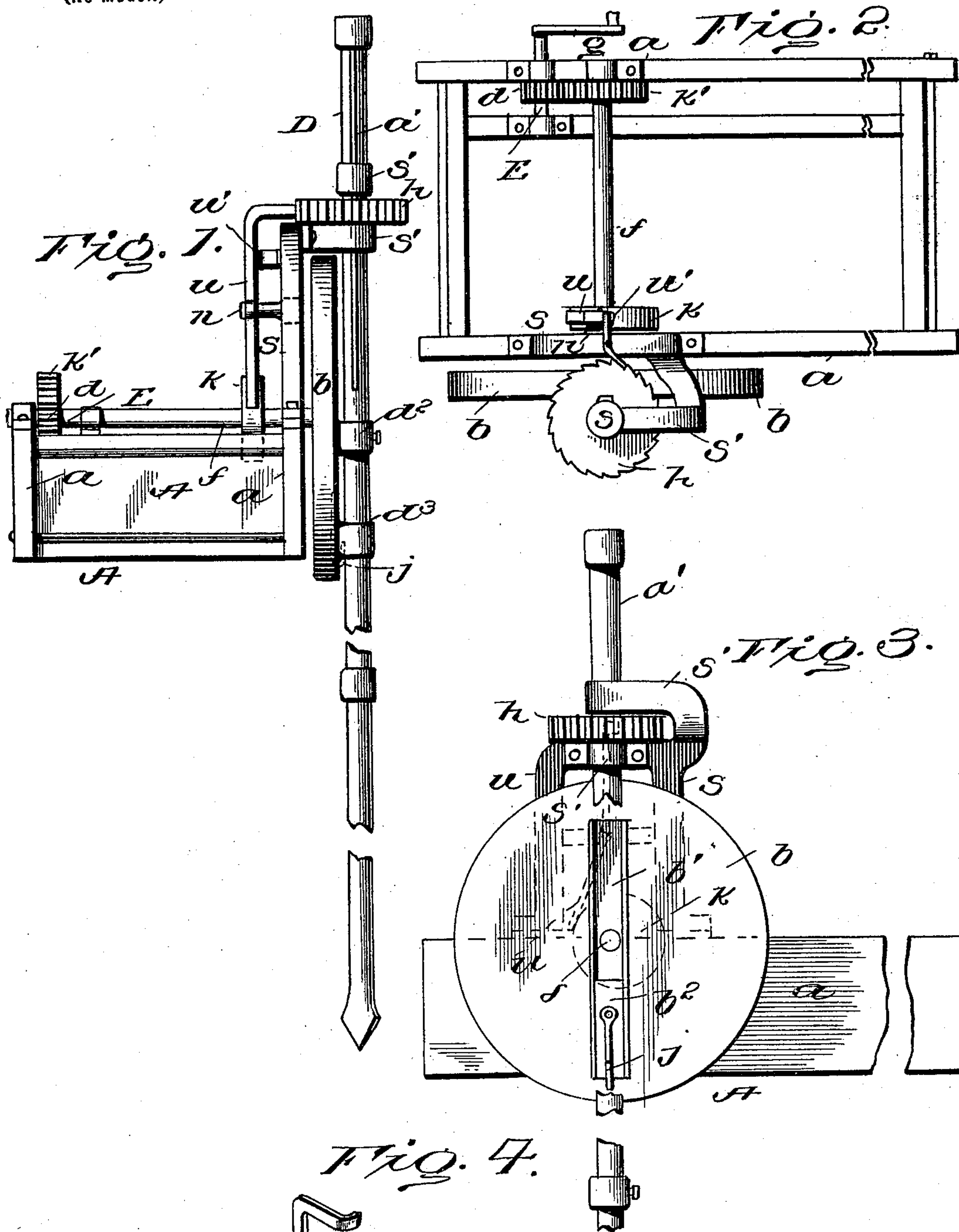
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G. WETHERBY.

APPARATUS FOR BORING AND DISINTEGRATING EARTHY MATTER.

(Application filed Jan. 8, 1898.)

(No Model.)



Witnesses

Joe M. Mice
Vellie Yates.

Inventor
George Wetherby
by F. L. Johnson
Attorney

UNITED STATES PATENT OFFICE.

GEORGE WETHERBY, OF DULUTH, MINNESOTA.

APPARATUS FOR BORING AND DISINTEGRATING EARTHY MATTER.

SPECIFICATION forming part of Letters Patent No. 639,836, dated December 26, 1899.

Application filed January 3, 1898. Serial No. 665,591. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WETHERBY, a citizen of the United States, residing in the city of Duluth, in the county of St. Louis and State of Minnesota, have invented new and useful Improvements in Apparatus for Boring and Disintegrating Earthy Matter, of which the following is a specification.

This invention relates to improvements in mechanism in devices for use in boring into the earth, frozen earth, or rock, and is designed for use in placer-mining where the dirt is too hard or too much frozen to dig to advantage with the usual outfit of the placer-miner.

The invention consists, essentially, of a boring-tool and a frame upon which said boring-tool is mounted.

The invention further consists in the novel construction and arrangement of the several parts of the device, hereinafter described, illustrated in the drawings, and more particularly pointed out in the claims hereunto appended.

In the drawings, Figure 1 is a side elevation of a portion of my boring-machine, showing the rotating and reciprocating mechanism for operating said boring-tool. Fig. 2 is a top plan view thereof. Fig. 3 is an end view of the device, showing the reciprocating mechanism. Fig. 4 is a detail.

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

Referring to the drawings by letters, A represents the boring-tool-operating frame, which is provided near one end thereof with a transverse shaft *f*, journaled in side beams *a a* of the frame A. On one end of said shaft, to the inside of the frame, is mounted an eccentric *k*. Near the opposite end of this shaft, mounted thereon, in the inside of said frame is a gear-wheel *k'*, which meshes with the pinion *d*, mounted upon a shaft E, also journaled in the frame A, having one end thereof projecting beyond the frame and provided with a crank *g*.

The end of the shaft *f* on one side of the frame projects slightly to the outside and has mounted thereon a large fly-wheel *b*. In the outer face of this fly-wheel *b*, extending across the face thereof, is a groove or slot *b'*, into which is set and moves to and fro a traveler *b²*. Upon this frame A is securely mounted a bracket S, having its upper ends or legs *s'*

s' set at right angles and provided with a suitable bearing, into and through which extends the upper end of a suitable boring-tool holder D, which is provided with a longitudinal groove *a'* near the upper end thereof and extends downward for about one-half of the length of said holder. Upon said holder D, between the brackets *s' s'*, is mounted a ratchet-wheel *h*, provided with a lug (not shown) adapted to fit into the groove *a'* in the holder D for the purpose of rotating said holder and at the same time permitting a vertical reciprocation thereof, as is apparent.

u is an operating-lever swiveled at *n* upon the bracket S, having one end thereof resting upon the surface of the eccentric *k* and the opposite end thereof turned at right angles and engaging the ratchet-wheel *h*.

u' is a suitable spring secured to the bracket S and bearing against the lever *u* for the purpose of holding the lower end of said lever in constant contact with the periphery of the eccentric *k*.

d² is a suitable connection, consisting of a collar and binding-screw, for securing the boring-tool to the holder D.

d³ is a suitable collar or link upon the boring-tool or drill and is provided with means for engaging a hook *j'* on the traveler *b²*, whereby, through the fly-wheel *b*, the said boring-tool is caused to reciprocate.

This device is used chiefly for boring through frozen earth and such other deposits as afford great resistance. When the ground to be worked in can be bored by the use of an earth-auger, I prefer to remove the rotating and reciprocating boring-tool and replace it by a rotating boring-tool or earth-auger. This auger has at its boring end three points arranged to properly cut and loosen up the earth.

This boring-tool-manipulating device may be operated either by hand or steam power, depending very much upon the character of ground in which work is being done.

When the boring-tool has been placed in position for boring, power is applied to the crank *g* by either hand or any other desired means. When the crank *g* is turned, the shaft E, connected thereto, will revolve, causing the pinion *d*, mounted thereon, to revolve the gear-wheel *k'*, meshing therewith, which revolves the shaft *f* and also the eccentric *k*, mounted

thereon, and likewise the fly-wheel *b*, keyed on the end of said shaft to the outside of the frame. As the fly-wheel *b* turns the traveler *b*² slides back and forth in the slot in the face of said fly-wheel, thus reciprocating the holder D and tool connected therewith. At the same time with this vertical reciprocation of the tool the eccentric *k*, keyed upon the shaft *f*, will oscillate the lever *u*, which engages the ratchet-wheel *h*, mounted upon the holder D, turns said ratchet-wheel and the holder D, to which it is secured, one notch at each revolution, and consequently at each reciprocation of the drill.

When the character of the material operated upon warrants, the reciprocating and rotating tool is removed, and in place thereof is substituted a rotating tool. The operation of the auger is the same as that of the drill with the exception that it is not reciprocated. By means of a suitable derrick or other means the dirt is conveyed from the boring-point to a reducing-tank and there subjected to the action of steam for the purpose of more thoroughly disintegrating it.

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

1. In a machine of the character described, the combination of the main frame, the tool-holding supporting-bracket having legs *s'*, *s'*, mounted thereon, a shaft suitably mounted in said frame and carrying an eccentric *k*, and a fly-wheel *b* provided with a channel or guide across its outer face, a hook-carrying traveler adapted to slide back and forth in said guide or channel, and a lever having one end thereof engaging with the eccentric on said shaft, and the opposite end adapted to

engage a suitable pinion; with a boring-tool holder mounted in the tool-holding bracket S, a ratchet-wheel *h* secured on said tool-holder, between the legs *s'*, *s'* of the bracket, in such manner as to permit a longitudinal reciprocation thereof, and a tool secured in the lower end of said holder and loosely connected to the sliding traveler on the fly-wheel, by means of a hook, means for operating said mechanism to simultaneously reciprocate and rotate the said tool, as set forth.

2. In a machine of the character described the combination of the main frame, the boring-tool-supporting bracket having legs *s'*, *s'* mounted thereon, a shaft suitably mounted in said frame and carrying an eccentric *k*, and a fly-wheel *b* provided with a channel or guide across its outer face, a hook-carrying traveler adapted to slide back and forth in said guide or channel, and a lever pivoted on said frame and having one end thereof engaging with the eccentric and the opposite end adapted to engage a suitable ratchet-wheel on the tool-holder; with a holder mounted in said tool-holding bracket, a suitable tool mounted in said holder and means substantially as described whereby the said traveler *b*² may be connected to or disconnected from the tool-holder to give either a simultaneously rotating and reciprocating motion to said drill, or merely a rotating motion, all constructed and arranged substantially in the manner and for the purpose specified.

GEORGE WETHERBY.

In presence of—

GEO. F. DAVIS,
J. A. PAYNE.