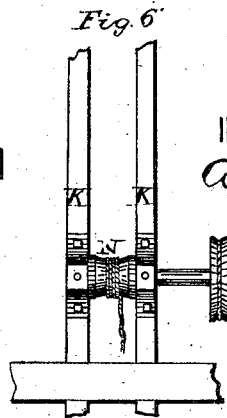
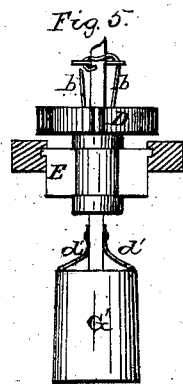
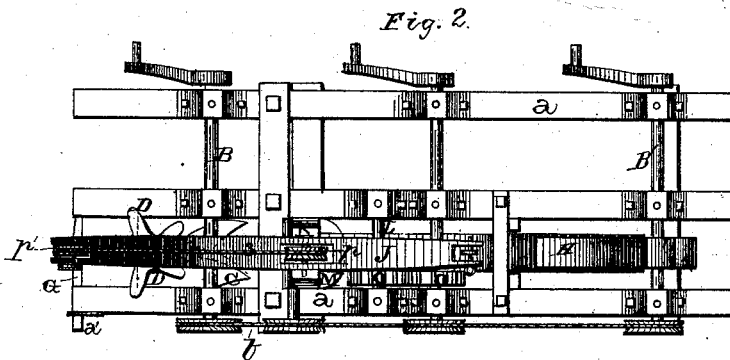
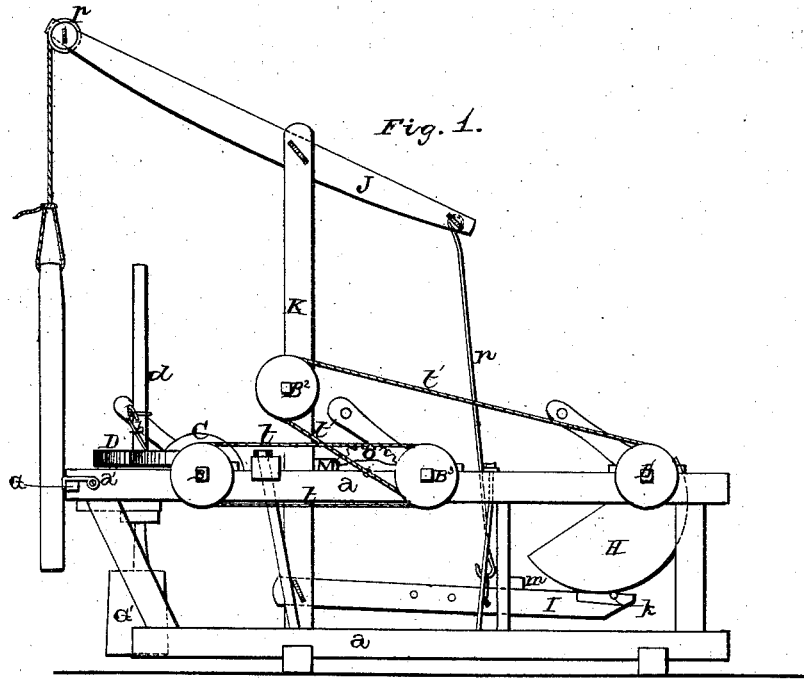


A. BURDICK.
WELL-BORING AND DRILLING-MACHINES.

No. 194,547.

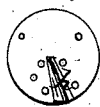
Patented Aug. 28, 1877.



WITNESSES

de J. de J. de J.
W. Warner

Fig. 3. Fig. 4.



INVENTOR

A. Burdick
per
F. A. Lehmann
Atty

UNITED STATES PATENT OFFICE.

ALFRED BURDICK, OF BALDWIN, IOWA.

IMPROVEMENT IN WELL BORING AND DRILLING MACHINES.

Specification forming part of Letters Patent No. **194,547**, dated August 28, 1877; application filed June 23, 1877.

To all whom it may concern :

Be it known that I, ALFRED BURDICK, of Baldwin, in the county of Jackson and State of Iowa, have invented certain new and useful Improvements in Machines for Boring and Drilling; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

The nature of my invention consists in the construction and arrangement of a combined boring and drilling machine for boring and drilling wells, as will be hereinafter more fully set forth.

In the annexed drawings, which fully illustrate my invention, *a* represents the framework of my machine, constructed in any suitable manner.

Near one end of this frame is a shaft, *B*, which drives the boring attachment by means of a worm, *C*, on said shaft taking into a worm-wheel, *D*, which latter is journaled in a movable boxing, *E*, sliding in grooves in the frame, and held in place by a key, *G*, that is fastened by a catch, *a'*. By raising this catch the key, sliding box, and worm-wheel can be removed when desired.

From the upper surface of the worm-wheel *D* project two slanting pins, *b b*. The wrench is to be placed near the top of these slanting pins when commencing to bore, and goes down with the auger until it strikes the worm-wheel, when the cylinder will be full.

d is the auger-shaft, passing through the worm-wheel *D* and having at its lower end two iron straps, *d'*, running down the sides of the cylinder *G*¹, and bolted to the bottom.

This cylinder is tapering, being smaller at the top than at the bottom, thereby letting in air as it goes down and preventing friction.

One-half of the cylinder forms a door, *G*², which is hinged or pivoted at the top to the straps *d'*, and this door, when open, acts as a fulcrum to pry over and empty the cylinder. The bottom of the cylinder is level, and has a projecting steel bit, *h*, fastened to it by bolts, so that it can be removed when required. The top of the bit *h*, inside of the auger, is

turned upward, forming a sharp edge, *e*, to keep sand and gravel from closing the interior hinged valve *f*.

At the opposite end of the frame *A* is another shaft, *B*¹, which gives power to the drill by a cam or square jog on the cam-wheel *H*, attached to it and striking the end of the lever *I*, and continuing on a roller, *k*, in said lever, whereby a great power is obtained over the old way with the double leverage on this machine. This lever is at its front end suitably lined with iron plates, and has a rubber bumper, *m*, mortised into it for preventing noise and jar as the lever flies up again. It will be seen that the power is applied entirely to the end of the lever, which is of great advantage.

The lever *I* is, by a rod, *n*, connected with one end of a walking-beam, *J*, mounted or hung in the top of a derrick, *K*. In the center of this walking-beam is a mortise, with pulley, *p*, over which the cord *s* of the drill passes from its windlass *L*, said cord passing from the pulley *p* over a pulley, *p'*, at the outer end of the walking-beam *J*, so as to carry the drill out over the well, and not be in the way.

The derrick *K* is hinged or pivoted at the bottom, and held in upright position in the frame by a button, *M*, so that when not in use it can easily be lowered. On the derrick is a windlass, *N*, for hoisting the bucket for cleaning well or trying water.

The shafts *B* and *B*¹ are to be connected with the tumbling-rods from the horse-power connected at either end, while the shafts *B*² and *B*³ are to be turned by cranks or by belts.

The shaft *B*² is the shaft of the windlass *N*, and the shaft *B*³ is by gears *O O* connected with the windlass *L*, as shown.

When these are run by belts, one belt, *t*, runs from the shaft *B* to *B*³, and from shaft *B*³ to shaft *B*¹. Also, a belt, *t'*, running from shaft *B* to *B*², and from *B*² to *B*³.

The lever *I*, when not in use, is fastened down by a pin, to keep it out of the way of the eccentric-wheel *H*.

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

1. In a well-boring machine, the combina-

tion of a worm, C, and worm-wheel D, for operating the auger, as herein set forth.

2. The combination of the worm-wheel D, sliding boxing E, key G, and catch *a'*, as and for the purposes herein set forth.

3. The slanting pins *b b*, projecting from the top of the worm-wheel D, for the purposes herein set forth.

4. The auger-bit *h*, having its inner back part *e* turned upward, in combination with the auger-bucket and the valve *f*, for the purposes herein set forth.

5. In combination with the boring-machine herein described, the walking-beam J, with

central pulley *p* and end pulley *p'*, as and for the purposes herein set forth.

6. The derrick K, carrying the walking-beam J at its upper end, and pivoted at its lower end, and held in position by a button. M, whereby the derrick can be raised and lowered at will, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of June, 1877.

ALFRED BURDICK.

Witnesses:

WM. WILCOX,
SCHEIB BROS.