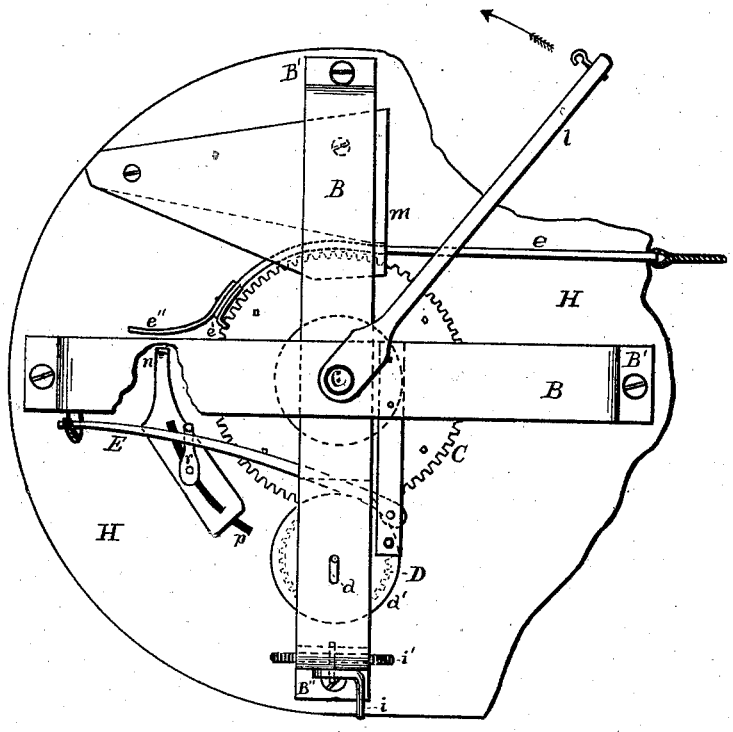
W. H. YARBOROUGH. 2 Sheets—Sheet 1.

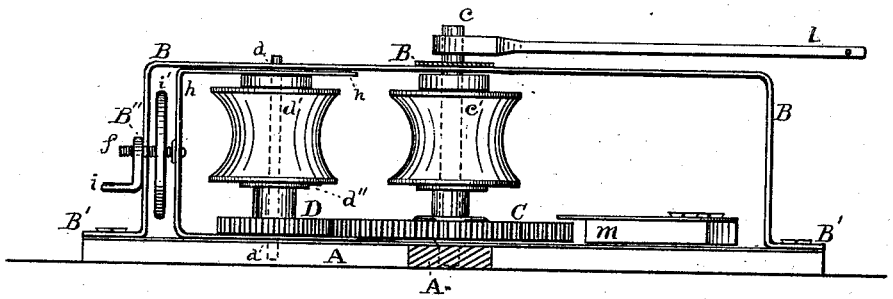
Earth-Boring Machine.

No. 198,911. Patented Jan. 1, 1878.

—FIG. 1.—



—FIG. 2.—



—WITNESSES—

Chs E. Lewis

Jno R. Sledden

—INVENTOR—

William H. Yarborough

By his Attorney

Chas B. Mann

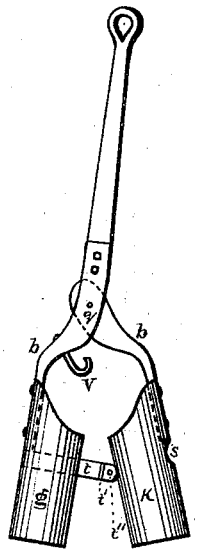
2 Sheets—Sheet 2.

W. H. YARBOROUGH.

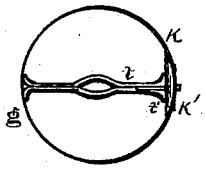
Earth-Boring Machine.

No. 198,911. Patented Jan. 1, 1878.

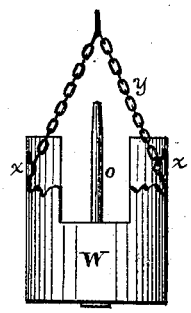
—FIG. 3.—



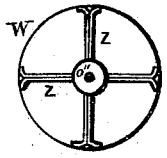
—FIG. 4.—



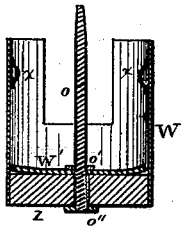
—FIG. 5.—



—FIG. 6.—



—FIG. 7.—



—WITNESSES.—

Chs. E. Lewis.

Jno. R. Spedden

—INVENTOR.—

William H. Yarborough

By his Attorney

Chas B. Mann

UNITED STATES PATENT OFFICE.

WILLIAM H. YARBOROUGH, OF SHERMAN, TEXAS.

IMPROVEMENT IN EARTH-BORING MACHINES.

Specification forming part of Letters Patent No. **198,911**, dated January 1, 1878; application filed October 6, 1877.

To all whom it may concern:

Be it known that I, WILLIAM H. YARBOROUGH, of Sherman, in the county of Grayson and State of Texas, have invented a new and useful Improvement in Earth-Boring Machines, which is fully set forth in the following specification and accompanying drawing, in which—

Figure 1 is a plan of the boring-machine. Fig. 2 is an elevation, partly in section. Fig. 3 is a view of drill or auger. Fig. 4 is a view of cutting-edge of same. Fig. 5 is a side view of mud-bucket. Fig. 6 is a bottom view of same, and Fig. 7 is a vertical section of same.

Referring to the drawing, Sheet 1, A represents two sills, crossing each other at right angles, and forming the lower part of a frame, of which the pieces B, constructed of iron or wood, and crossing each other, as shown, with the ends secured to the sills at B′, form the upper part. This frame is secured to the platform H, which may be made of wood or metal.

C is the drive-wheel, the journal *c* of which passes through the frame, and is revolved or set in motion by the horse-lever *l*, keyed to the journal. This wheel gears with the wheel D, which is journaled in a carrying-frame, *h*, having attached an arm, *f*, that is screw-threaded. The journals of the shaft upon which the wheel D is keyed extend through slots *d* at top and bottom of the frame. The arm *f* passes through the frame at B″, and an adjusting-crank, *i*, screw-threaded to fit the arm, is placed thereon outside of the frame, and a crank-wheel, *i′*, also screw-threaded, is placed on the arm between the frame *h* and part B″. The first-mentioned crank is employed to draw the frame *h*, by which the wheel D is thrown out of gear with wheel C, and the last-mentioned crank to put these wheels in gear. Both cranks may be employed in conjunction to hold the carrying-frame at any point desired.

The shaft to which the wheel D is attached has a drum, *d′*, keyed at *d″*, and a similar drum, *e′*, plays loosely on the shaft to which the wheel C is attached, serving to keep the drill-rope, which is wound on drum *d′*, in line therewith when raising or lowering the drill. The brake-lever E can be arranged to admit of applying it to either drum.

A leather or rawhide strap, *e*, has attached at one end a catch, *e′*, to engage with the teeth of wheel C, and a release, *e″*, and to the other end the drill-rope is attached. A guide or shoe, *m*, made preferably of metal, is secured to the platform, and is so formed as to confine the band *e* and catch *e′*, thereby insuring the engagement of the latter with the teeth or cogs on wheel C. The shoe can be adjusted to regulate the engagement of the catch. Also, lessening or increasing the thickness of the strap will effect the same object.

An arc-shaped slot, *p*, is formed in the platform, having its center at the shaft of wheel C. The stop *n* is adjusted in this slot by the cranked set-screw *r*, and, by receiving the stroke of the release *e″*, regulates the length of stroke of the drill.

The drill or auger consists of two curved or semicircular steel plates, *g*, and K, attached to the drill-shafts *b*, which are hinged at *q*, to permit the two-part hollow drill to open. A bar, *t*, is fixed by one end to the curved plate *g*, and is shouldered near the other end, as shown at *t′*, and has a hole, *t″*, through the extreme end. This end of the bar passes through a slot formed in a depression, *s*, on the curved plate K, and is then secured by the pin K′. The rope is attached to the loop or eye at upper end of drill-shaft. When the drill or auger is filled with earth and withdrawn from the well, it will discharge its load upon the removal of the pin K′.

On striking water the mud or sand bucket W (shown in Figs. 5, 6, and 7) is brought into requisition. This bucket fits closely within the drill or auger *g* K, and is secured in place by a chain, *y*, attached to loops *x x* in the bucket and the hook V on the drill-shaft. The sides, having the loops *x*, cover the cracks in the drill or auger where the curved plates join, and prevent leakage. The bucket can be made of any desired length, and has at the bottom cross-bars *z*, with lower edges sharpened to cut the mud or sand. Upon these bars rests the leather valve W′. Four bars are shown in the present example; but more can be used,

if found necessary, to sustain the flexible valve at all points of its circumference. The valve is secured to its place by a rod or pin, *o*, screw-threaded to receive the nut *o'* above, and the nut *o''* below, the bars.

To empty the mud-bucket of its contents the chain *y* is disconnected, and the bucket will slide out by its own weight, and can then be emptied and replaced.

When the operation of drilling is in progress, the horse, attached to lever *l*, moves in the direction of the arrow, and passes over the ropes between the derrick and the machine. The catch *e'* engages with a tooth of the wheel, and is carried around with the strap *e*, resting on the periphery or teeth, thus raising the drill. The release *e''* strikes the stop *n*, disengaging the catch, and at once the drill drops, to be again raised and dropped by a repetition of this operation.

To remove the drill from the well, the strap *e*, with catch, is shoved forward out of the way, while the drill is raised by the main rope.

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

1. In an earth-boring machine, the frame *h*, carrying the wheel D and drum *d'*, upon which the main rope is wound, and having the screw-threaded arm *f* and cranks *i* and *i'*, as shown and described, and for the purpose specified.

2. The strap *e*, having attached a catch and release, substantially as herein shown, and the adjustable stop *n*, toothed wheel C, and guide or shoe *m*, as and for the purpose described.

3. The earth-drill consisting of the two curved plates *g* K, attached to hinged shafts *b*, with the bar *t*, shouldered at *t'*, fixed to one plate, and a slot formed in a depression, *s*, on the other plate, as shown and described.

4. The combination of the two-part drill *g* K, having the hook V on the drill-shaft, as herein shown, and the mud-bucket, adapted to fit closely within the drill, to which it is secured by the chain *y*, and provided with a flexible valve resting upon the cross-bars *z*, which have sharpened lower edges, the valve being secured at its center by rod *o* and nuts *o'* and *o''*, as shown and described, and for the purpose specified.

WILLIAM H. YARBOROUGH.

Witnesses:

J. G. RAINEY,

J. V. COCKALL.