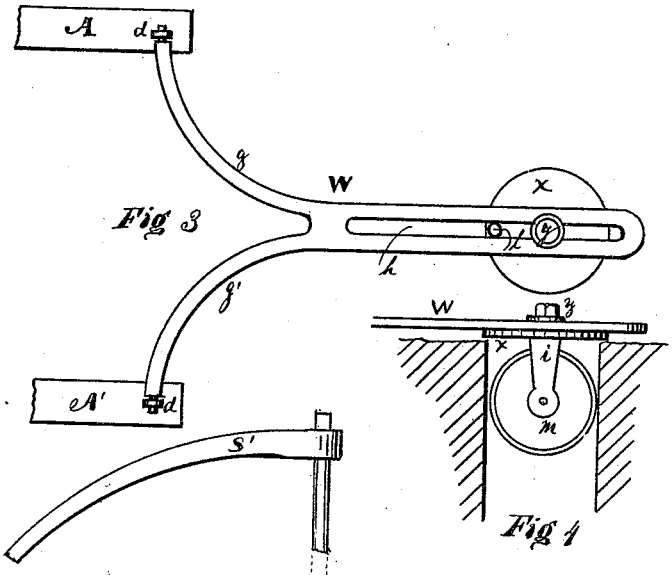
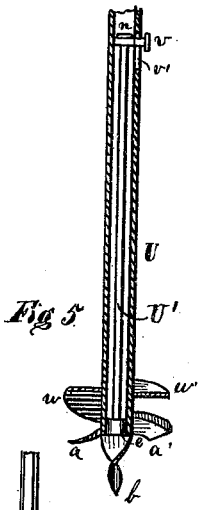
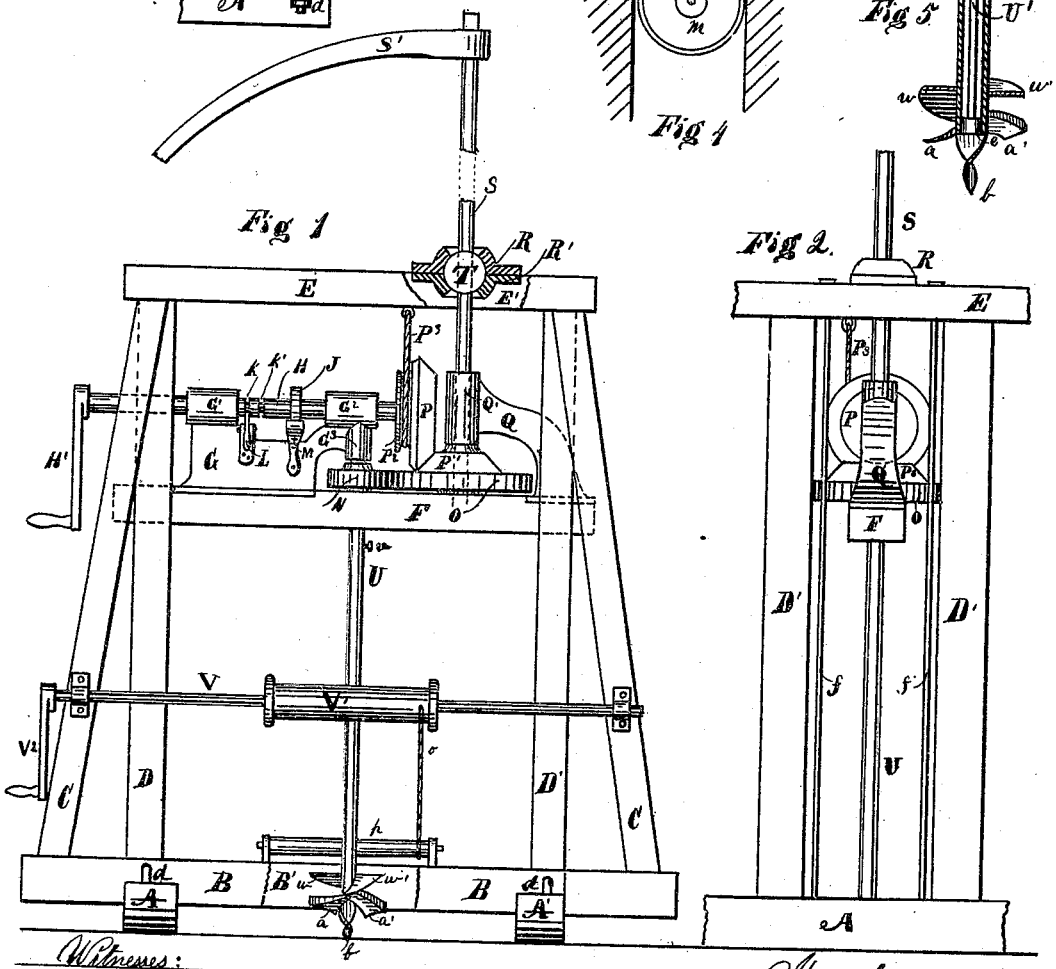
A. W. MORGAN.

EARTH-BORING MACHINE.

No. 180,493. Patented Aug. 1, 1876.







Witnesses;

H. A. Moore

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UNITED STATES PATENT OFFICE.

ALFRED W. MORGAN, OF INDIANAPOLIS, INDIANA.

IMPROVEMENT IN EARTH-BORING MACHINES.

Specification forming part of Letters Patent No. **180,493**, dated August 1, 1876; application filed July 10, 1876.

To all whom it may concern:

Be it known that I, ALFRED W. MORGAN, of Indianapolis, county of Marion, State of Indiana, have invented a new and useful Improvement in Post-Hole Boring Machinery, of which the following is a description, reference being had to the accompanying drawing.

The object of my invention is to bore post-holes at regular distances by machinery; and my invention consists of the construction and arrangement of devices, as fully set forth in the claims.

Figure 1 represents an elevation of my improved machine. Fig. 2 is a side elevation of the same, partly in section. Fig. 3 is a plan view of the spacing attachment. Fig. 4 represents the spacing attachment in one of the post-holes. Fig. 5 is a sectional view of the auger and auger-shaft, showing the movable auger-point, and the means by which air is admitted to the bottom of the auger while in the hole to allow the auger to be withdrawn with its load of earth.

The frame of my post-hole machine is composed of the two sills A A′, which are rounded off at each end similar to a sled runner, the cross-sills B B, the upright corner-posts C C, the top frame E E′, and guide-posts D D, as shown. The top frame is also secured and prevented from becoming loose by means of the tie-rods *f f′*, as shown in Fig. 2. Between the guide-posts D D′, which are set wide apart, is suspended the cross-head F, on which are secured two castings, G and Q. The casting G is formed with journal-boxes G^1 G^2 for the crank-shaft H to operate in, and also a socket-bearing, G^3, for the upper end of the auger-shaft to operate in. On the shaft H is the crank H′ at one end, and the miter-wheel P at the other, and a sheave, P^2, attached to the shaft H or miter-wheel P, as shown. The shaft H is provided with two grooves, K K′, in which the lever L can be operated to either hold the miter-wheel P in or out of gear with miter-wheel P^1. The ratchet J is also secured to the shaft H, and the pawl M is designed to hold the shaft and cross-head in any desired position. The auger-shaft U is formed as shown in Fig. 5, and is composed of the outside pipe U and rod U′. The pipe U is perforated at *v′*, and the lifter *v* is here attached to the inside rod U′ at *n*. The lower end of the rod U′ is enlarged, as at *e*, so as to fill the pipe U, and below the part *e* the end of the rod is formed into a twisted bit, *b*. The upper edges of the twisted part engage with notches or a clutch formed at the bottom of the tube U. The auger-bits *w w′* are attached as shown in Fig. 1, having the two diamond-shaped points *a a′* on a line with each other, and at opposite sides. The casting Q is also attached to the cross-head F, as shown, and is provided with an upright bearing, Q′, for the shaft *s* to operate in. The lower end of the shaft *s* operates in a socket formed in the cross-head F, and on the shaft above the cross-head is secured the spur-wheel O, having the miter-wheel P^1 above. The spur-wheel O meshes in gear with the pinion N on the auger-shaft U, as shown, and the miter-wheel P^1 meshes in gear with the miter-wheel P on shaft H, as shown. The shaft S passes through a ball, T, which operates in a socket, R R′, attached to the top frame E′, in the manner shown in Fig. 1. This arrangement allows the cross-head F to be adjusted to any angle required, either sidewise or endwise, so as to allow the auger-bit *w w′* and shaft U to stand perpendicular at all times, whether the frame of the machine is on the side of a hill or on level ground. The ends of the cross-head F can be provided with rollers on each side to engage with the inside of the guides D D′, to ease the friction of the cross-head as the auger is entering the ground or being withdrawn therefrom. The upper end of the shaft S is made to receive the sweep S′, and may be operated by hand or horse power, as required. The windlass V V^1 V^2 has a rope, *o*, attached thereto, and passes under a roller or sheave on the sill B′, and is attached to a stake in advance of the machine, on a line of the fence, to move the machine ahead when required. The rope P^3 is attached to the frame E, or passes over a pulley attached thereto, and further attached to the cross-head F, and is operated by the crank H^1, and shaft H^2, and sheaves P^2, to raise or lower the cross-head, as required.

The spacing attachment W (shown in Fig. 3) is constructed similar to the form shown—that is, the two arms *g g* are arranged to be

pivoted to the sills A A′ at *d d′*, as shown, and the extended part W is provided with a slot, *h*. In this slot *h* is secured the disk *x* by means of the bolt *y*. The disk *x* is prevented from turning around by means of the pin *l*. Below the disk *x* is the wheel *m*, pivoted to the stud *i*, the upper end of the stud *i* being the bolt *y* of the disk *x*.

The operation of my improved post-hole machine is as follows: The machine being placed in position, with the auger *w w′* in position, power is applied to the sweep S′, and motion is communicated to the auger-shaft U by the spur and pinion wheels O N. As the auger revolves, the feed is regulated by the hand-crank H^1 and its connection until the auger is at its proper depth. Then the miter-wheel P is thrown in gear with the miter-wheel P^1, and the power of the horse is used to raise the auger, still revolving. As the auger is drawn up the inside rod U′, with the twisted bit *b*, either drops or is forced down, thus giving a supply of air through the tube U and relieving the auger from all vacuum beneath it. After the auger has been removed the machinery is moved ahead on a line of the fence by means of the windlass V V^1 V^2, and its connections, the proper distance for another hole, and then the roller *m* is adjusted in the slot *h* of the spacer W, so as to fall into the hole already bored, and the next hole is bored, and so on until the last, the roller *m* always falling into the last hole bored until there is another one ready, and the disk *x* covers up the hole, so that the horse can travel over it.

What I claim as new, and wish to secure by Letters Patent, is—

1. The adjustable cross-head F, provided with shaft-supporting boxes G^1, G^2, G^3, and Q′, in the manner and for the purposes set forth and described.

2. A post-hole boring device, consisting of the adjustable cross-head F, castings G and Q, provided with shaft-boxes G^1, G^2, G^3, and Q′, crank-shaft H, sheave P^2, miter-wheel P, hollow shaft U, pinion N, spur-wheel O, pinion P^1, shaft S, and ball and socket T R R′, arranged to operate substantially as set forth.

3. The boring-shaft, consisting of the outer tube U, perforated with a slot, *v′*, near the top, and provided with two diamond-pointed augers, *w w′*, at the bottom, and the rod U′ connected with the lifter *v*, and having a twisted bit *b* at its lower end, the upper edges of the twisted bit making connection with notches or clutch in the bottom of the tube U, so as to revolve with the tube in boring, as set forth and described.

4. In combination with a post-hole boring machine, the spacing attachments, consisting of the hinged extension-piece W, provided with slot *h* and disk *x*, roller *m* and stud *i*, all arranged to operate and space off distances between holes, substantially as set forth and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED WHITE MORGAN.

Witnesses:
E. O. FRINK,
E. C. WHITNEY.