F. W. McCAIN & J. J. PURINTON.

EARTH-AUGER.

No. 184,977. Patented Dec. 5, 1876.

Fig. 1.

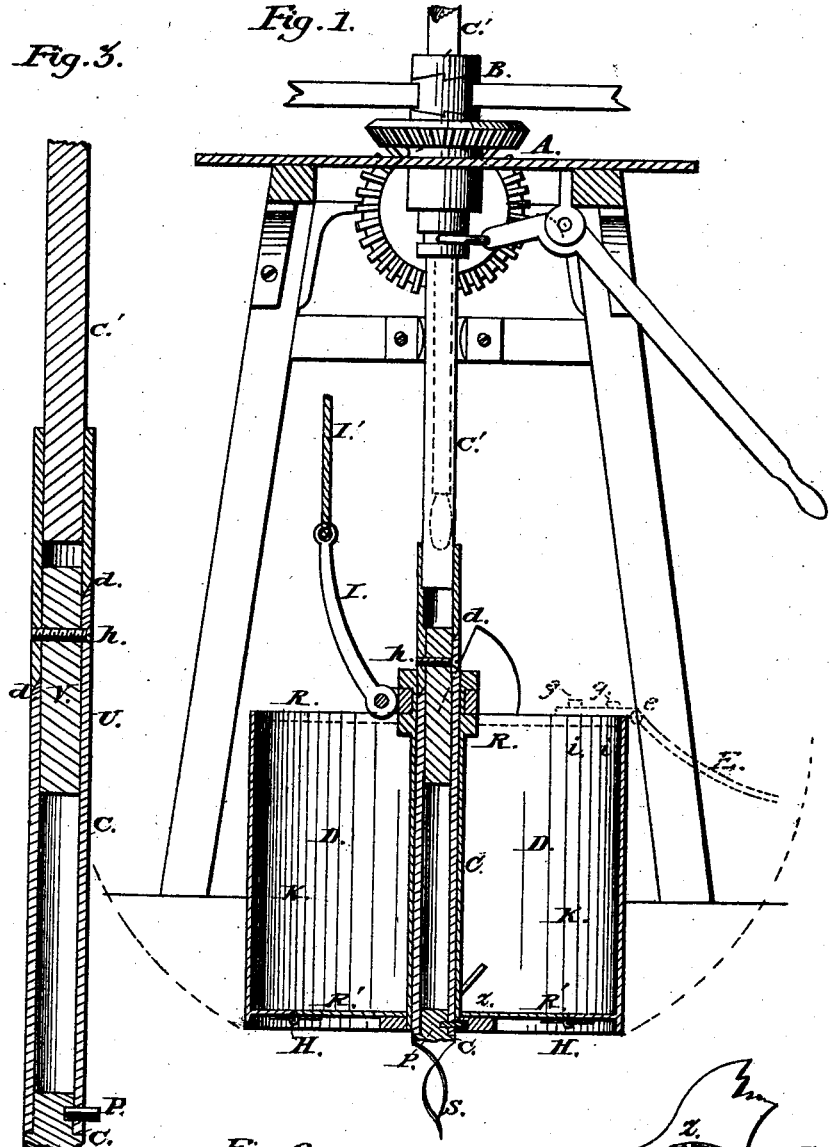


Fig. 3.

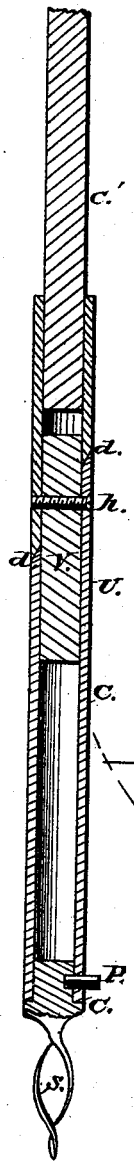


Fig. 2.

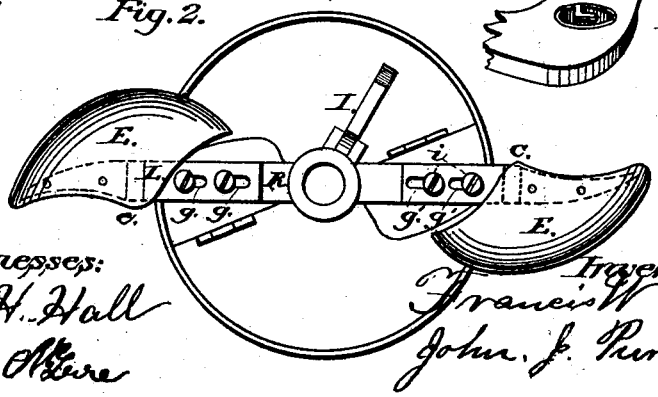
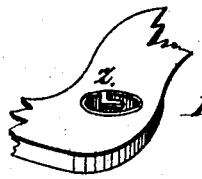


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANCIS W. McCAIN AND JOHN J. PURINTON, OF EAST LIVERPOOL, OHIO.

IMPROVEMENT IN EARTH-AUGERS.

Specification forming part of Letters Patent No. **184,977**, dated December 5, 1876; application filed April 15, 1876.

To all whom it may concern:

Be it known that we, FRANCIS W. McCAIN and JOHN J. PURINTON, of East Liverpool, Columbiana county, in the State of Ohio, have invented an Improved Earth-Auger, of which the following is a specification:

The object of our invention is a device for boring a well, and for hoisting the earth out without removing the shaft or auger-stem, the bucket and said shaft being self-locking, the shaft having flush joints; also forming the reamers that they will ream the well to a greater diameter than at the curb, without having to detach them every time the bucket is withdrawn.

The invention is illustrated in detail in the accompanying drawings, Figure 1 being a vertical section; Fig. 2, a plan view; Fig. 3, a detail of the auger stem or shaft; Fig. 4, a plan of a part of the lower cross-bar of the bucket, it being turned bottom-side up, so as to show the form of the notch hereafter mentioned, the same parts in the various figures being referred to by the same letter.

A is a horse-power, having a hollow hub, B, the hollow being square, and having a rotary motion. C C′ is the auger stem or shaft, the upper section C′ arranged so that it may fit into and be rotated by the hollow shaft B, through which it passes. The lower section C is round, and is connected to the upper section by a socket and pin joint, U V *d d*, Fig. 3, U being the socket and V the pin. *d d* show the line of the shoulders of the joint, which are cut beveling longitudinally, and bear against each other, sustain the torsion-strain, and convey the motion from one section to the other, said sections being flush at the joint, and of the same diameter throughout. The lower section terminates in a coarse screw-point, S. Above this point S a small pin projects from the shaft. D D is the bucket formed on a central frame, K K R R′, which gives attachment to the sides, which are hinged or pivoted to the frame at the top so they can be separated for the discharge of the earth, as is usual in buckets of this kind. R′ is the bottom cross-bar of the frame, to which are attached the two cutters H H. The bottom of the bucket is hinged to the sides, and when it is closed rests on said cross-bar, except those parts immediately in front of the cutters H H, which are hinged to open upwardly, so the earth may pass into the bucket when cut. R is the upper cross-bar of said frame and gives attachment to the reamers. In the center of both upper and lower cross-bars R and R′ are holes for the shaft C C′ to pass through. Z is a notch cut, as shown in the drawing, Fig. 4, in the side of the (shaft) hole in cross-bar R′. It corresponds to and receives the pin P of the shaft C, as shown in Figs. 1, 2, and 4, to which reference is had; and when the bucket is down on the stem or shaft it is locked thereto by this pin and notch P Z, so that the bucket receives a rotary motion and conveys the same to the cutters and reamers. E E are two reamers, curved, so as to convey the earth into the bucket at the top. They are hinged at *e e* to stems *g g*, which are bolted (through the slots) to the upper cross-bar R, and are set to cut the well to any desired diameter, the hinges *e e*, allowing the reamers to turn down out of the way, when the bucket is being drawn out of the well, and to extend when it is moving down. I is an arm attached to the bucket by a swivel. To the outer end of this arm is attached a rope, I′, which is connected to a hoisting drum or pulley in the horse-power.

As the well increases in depth the bucket feeds down by the square part of the shaft C passing down through the hollow shaft B, the shaft being lengthened from time to time by the addition of sections, having the socket and pin joint U V, between the upper and lower sections C and C′, as they are required, said section being the length of the square of the upper section C.

Operation: The derrick of the horse-power being placed over the desired location of the well, the lower section C′ of the auger-stem is passed up through the holes in the cross-bars R R′, until the pin P engages the notch Z. The upper section C′ is then passed up through the hollow hub B, and the two sections are then connected by inserting the pin V into the socket U, and passing the screw *h* through them. The shaft and bucket being locked together by the pin and notch Z, the machine is then put in motion, revolving on the screw-point S. The earth, as excavated by the cut-

ters H H, passes up into the bucket, while that cut by the reamers E E enters at the top, said reamers having been attached to the bar R, and adjusted to the desired diameter of the well. When the bucket is full, it is unlocked by a back movement of the stem, and is withdrawn, sliding upon the shaft or stem by drawing on the rope I, which passes round a drum, the reamers turning down on their hinges so that they pass through the curb, and also extend again when the bucket is lowered into the well.

Having thus described our invention and its operation, what we claim, and desire Letters Patent for, is—

1. In combination with an earth-auger, the shaft C C′, the sections being connected by a socket and pin joint, having the shoulders beveled longitudinally, as described, and for the object set forth.

2. In combination with the bucket D, and the stem C C′, the self-locking device of the notch Z, and the pin P, constructed and operating as described, and for the object set forth.

3. In combination with an earth-auger, the reamers E E, hinged so as to turn down alongside of the bucket when it is withdrawn from the well, for the object specified.

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Witnesses:
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