2 Sheets—Sheet 1.

W. W. JILZ.

EARTH-AUGER.

No. 173,794. Patented Feb. 22, 1876.

Fig. 1.

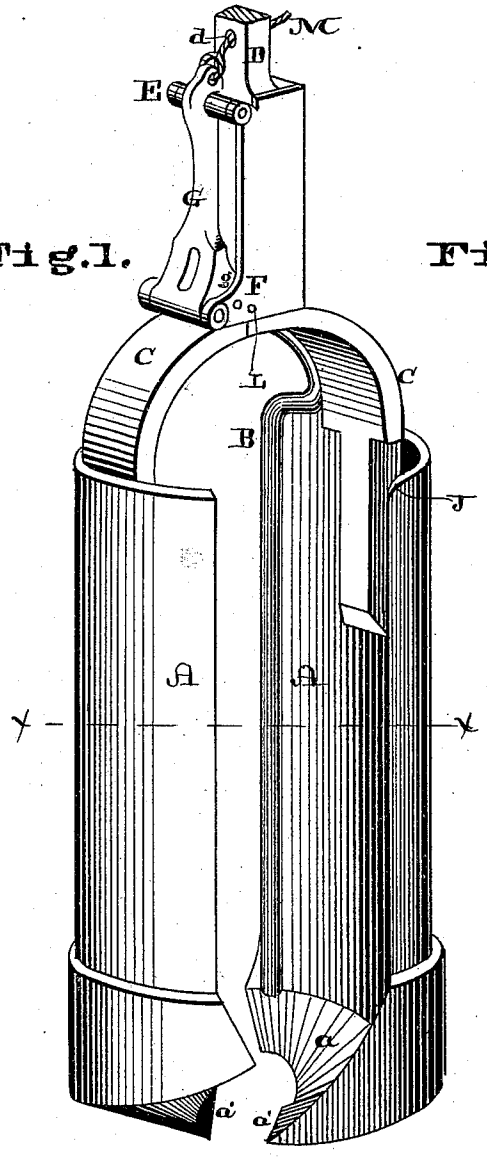
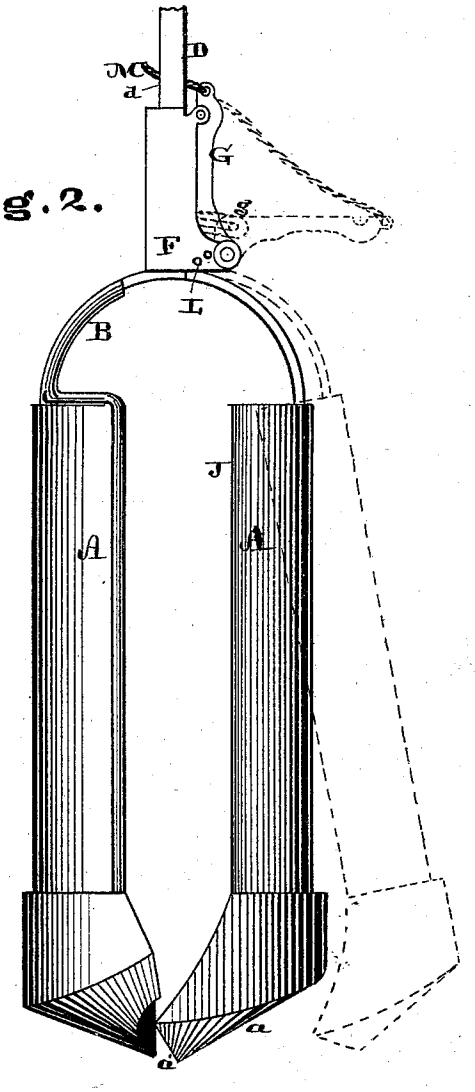


Fig. 2.



WITNESSES.

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2 Sheets—Sheet 2.

W. W. JILZ.

EARTH-AUGER.

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Fig. 3.

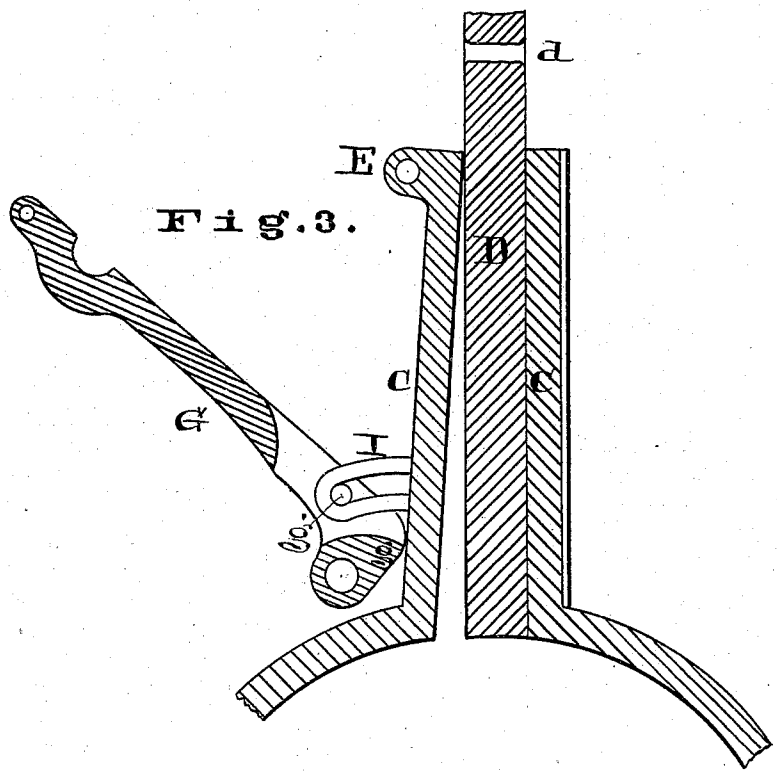


Fig. 4.

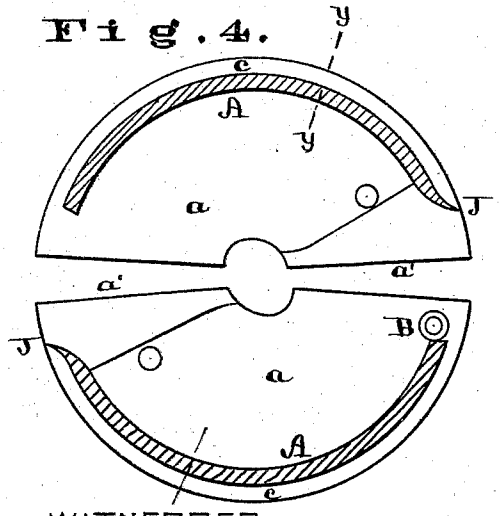
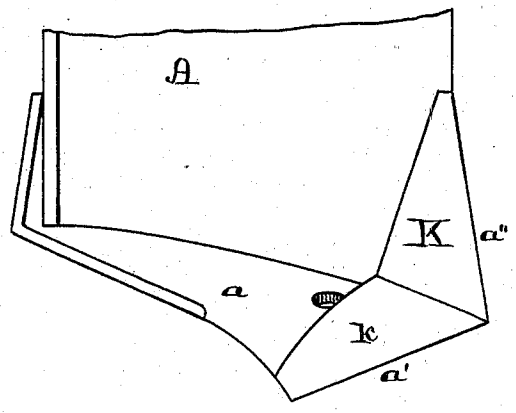


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM W. JILZ, OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN EARTH-AUGERS.

Specification forming part of Letters Patent No. **173,794**, dated February 22, 1876; application filed January 11, 1876.

To all whom it may concern:

Be it known that I, WILLIAM W. JILZ, a resident of the city and county of St. Louis, State of Missouri, have invented new and useful Improvements in Well-Augers, of which the following is a full, clear, and exact description, reference being had to the annexed drawing, making part of this specification, where—

Figure 1 is a perspective; Fig. 2, a side elevation, the dotted lines indicating the position of the parts when the auger is opened; Fig. 3, a central vertical section of the upper part of the auger and shank; Fig. 4, a cross-section of the auger on the line *x x*, Fig. 1; and Fig. 5, a detail, looking at the inner side of the lower end of one of the pods.

Like letters indicate like parts.

The present invention has relation to the means for enlarging a well and in boring wells of different diameters. It also relates to the provision for admitting a bowlder to, and retaining it in, the auger; also, to the means for closing the auger when beneath the ground, and for locking it when closed. It further has reference to the means whereby the wall of the well is trimmed and left in a smooth condition. It further has reference to the construction for facilitating the entrance of the earth into the auger. It also relates to the provision for boring a hole whose diameter is larger than that of the auger.

Referring to the accompanying drawing, A A represent two similar pods, of which the body of my auger is composed. In their general outline they are each semi tubular, and as shown in Figs. 1 and 2, in which also is shown their relative arrangement. Each of the pods is similarly provided with a bottom, *a*, and a cutting-lip, *a'*. The pod-bottoms, when the auger is closed, nearly approach each other, but are inclined crosswise to each other, and each bottom, at its center, is slightly hollowed out to provide additional room for the earth to enter the auger. B represents the air-tube, which can be attached to either pod. C C represent the shanks with which each pod at its upper end is respectively furnished, and which extend upward to the main shank D. At its extreme upper end one of the shanks C is pivoted to the main shank by means of the hinge E. If desired, the other shank C can be similarly hinged to the main shank. F F represent plates attached, respectively, to each side of the main shank, and of the shape shown in Figs. 1, 2. G represents a locking-lever, whose lower end is hinged to the plates F F. The lever, at its upper end, is provided with a cord, M, which passes through a hole, *d*, in the main shank. At the lower end of the lever, and inside the point of its connection with the plates F F, is an eccentric projection, *g*. A link, I, attached to the shank C, and engaging with a pin, *g'*, in the lever, prevents the latter from being opened too far. If desired, a similar lever can be similarly used on the other side of the main shank to lock the opposite pod when the latter is also pivoted to the main shank. J J represent cutting-lips, with which each of the pods is respectively provided. They extend vertically from the top of the auger down to the bottom thereof, and connecting with the usual cutting-lip at the bottom. The lips J J are also made to stand out, so as to bring their extreme edges as far from the center of motion as the outer edge of the cutting-lip *a'* below. K, Fig. 5, represents a projection extending vertically upward and upon the extension *a''* of the cutting-lip. This projection, in cross-section, is triangular, its forward face forming a bevel to the cutting-lip, and being similar in form to the projection *k* upon the lip *a'*. In shaping the pods A A, while in their general form they are semicircular, they are really made in curvatures of different radii—that is, (and as seen more distinctly in Fig. 4,) from the lines *y y*, respectively, to either lip J J, the curvature of the pods is of a larger radius than that of the remainder of the pods. The object of this is twofold: When the auger is being used in its opened form, and as indicated by the dotted lines in Fig. 2, the center of the pod, at *c*, would strike the wall of the hole in advance of the lip and prevent the action of the latter, unless the above described curvature is given to the pod, but when it is so shaped the lip stands out sufficiently to do its work. Another advantage is, that by it practically the diameter of the bore is always made slightly larger than the diameter of the auger, and thus the latter can be readily withdrawn from the well.

In operation, the auger can be used in the closed form shown in Fig. 1. In such case the locking-lever G is thrown up, bringing the eccentric *g* against the shank C, securely holding the two pods together. In this case the cutting-lips J J operate in combination with the lips below, trimming and smoothing the wall of the bore. The earth enters through the opening between the bottoms *a a*, and to remove the contents of the auger the lever G is turned down and the pods opened apart. Should a bowlder be encountered, the lever is suitably adjusted before the auger is put down into the bore, to allow the two pods, A A, to be freely pivoted together, then, as the auger is rotated in contact with the bowlder, the pods open sufficiently to admit it, and having entered between the pods, the latter close and retain the bowlder. Should it be necessary to enlarge the bore, the locking-lever is turned down and the pods opened out to the desired distance, and there held by means of a pin, L, which passes through a hole in the plate F and into the shank C. If it is desired to close the pods when the auger is down in the bore, it can be done by drawing the cord M, which passes from the lever G through the hole *d* in the main shank, and thence to the surface of the ground. In boring, the earth is apt to stick in the side of the pod, just above the bottom. To overcome this difficulty, I have arranged the projection K, as described. The earth is broken up in passing it, and prevented from adhering to the pod and bottom. By reason of the hole *d* in the shank D the pull on the lever can be made in the proper direction from the top of the ground.

Having described my invention, what I claim is—

1. The combination of the pods A A, bottoms *a a*, inclined crosswise to each other and hollowed out at their centers, shanks C C and D, and hinge E, substantially as described.

2. The combination of the pods A A, shanks C C and D, plates F F, pin L, and hinge E, substantially as described.

3. The combination of the pods A A, shanks C C and D, plates F F, hinge E, lever G, and eccentric *g*, substantially as set forth.

4. The combination of the pods A A, shanks C C and D, hinge E, plates F F, lever G, and cord M, substantially as set forth.

5. The combination of the shank D, hole *d*, plates F F, and lever G, substantially as described.

6. The combination of the pods A A and the lips J J, substantially as and for the purpose set forth.

7. The pods A A, when made in curvatures of different radii, substantially as and for the purpose set forth.

WILLIAM W. JILZ.

Witnesses:
CHAS. D. MOODY,
MALVINA JILZ.