F. D. HUBBARD.

EARTH-AUGER.

No. 185,638. Patented Dec. 26, 1876.

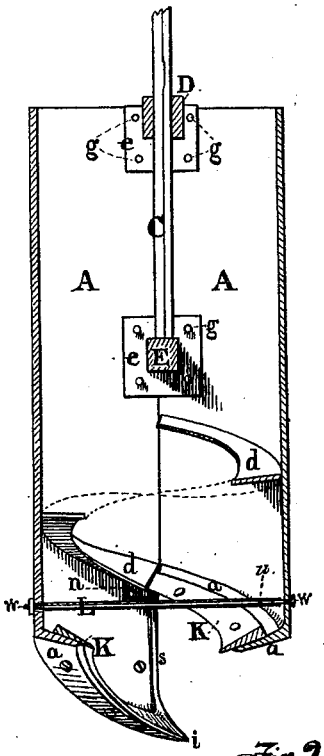

Fig. 2.
(Ver. sec. on line aa fig. 3.)

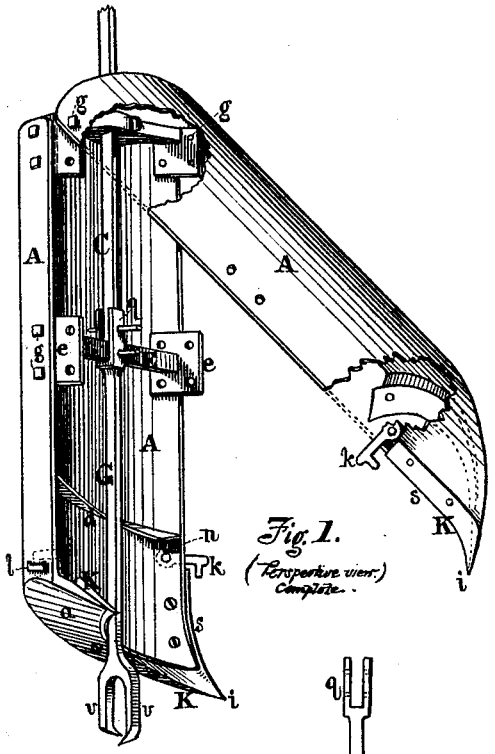

Fig. 1.
(Perspective view: Complete.)

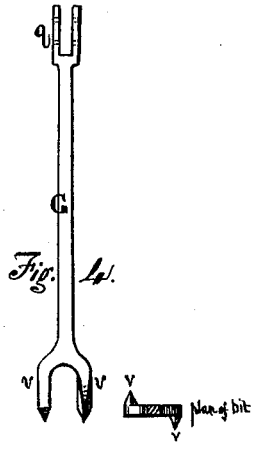

Fig. 4.

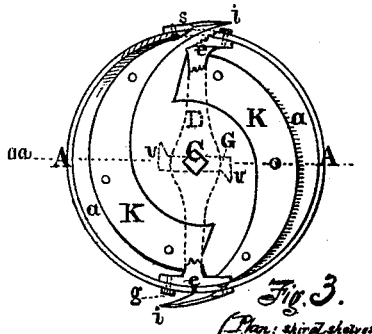

Fig. 3.
(Plan; spiral sheaves (d) removed.)

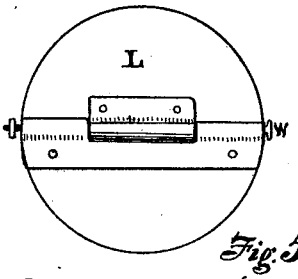

Fig. 5.
(natural)

Witnesses
Alexander Burton
Clarence Thurlow

Franklin D. Hubbard.
by E. Thurlow, his atty.
in fact.

UNITED STATES PATENT OFFICE.

FRANKLIN D. HUBBARD, OF PERU, ILLINOIS.

IMPROVEMENT IN EARTH-AUGERS.

Specification forming part of Letters Patent No. **185,638**, dated December 26, 1876; application filed May 17, 1876.

To all whom it may concern:

Be it known that I, FRANKLIN D. HUBBARD, of Peru, in the county of La Salle, in the State of Illinois, have invented an Improvement in Earth-Augers; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings, making a part of this specification, in which like letters of reference refer to like parts, and in which—

Figure 1 represents a perspective view of the auger with one-half swung open; Fig. 2, a vertical central section on line *a a*, Fig. 3; Fig. 3, a top view of auger; Fig. 4, elevation and plan of center extension or advanced borer.

This invention has for its objects and component parts as follows: This invention relates to a construction and combination of devices, as will be hereinafter explained, and pointed out in the clauses of claim.

A A represent the two halves of the auger or tube, each terminating below in a spiral head, *a a*, to which the bits K are respectively attached. These divisions A A are hinged at their adjoining upper corners by means of the pivotal screws or bolts *g g* in the plates *e e* of the cross-arm D of the center rod C, and at their meeting-edges attached to the next plates *e e* below, on the cross-rod E, by means of the screws *g g*, &c., and immediately above the bits said half-tubes are temporarily attached together by means of hooks and staples *k l k l*. The shelf of one of the bits is extended (in the same shape as said bit) upward for at least one circuit of the tube by means of the attached spiral shelfs *d d*, one to each half-tube, secured to the interior of the tube by means of lugs or angle-irons *n n*. C is the center rod; D, its upper cross-arm or brace slotted in the middle to receive said rod, and terminating at each end in a plate, *e e*, to which adjoining edges of the tube are screwed, the uppermost screws serving as pivotal pins. E represents the lower cross T-head of the center rod, which is similarly furnished with plates *e e*, by which the middle part of the auger is fastened to the rod by means of the screws *g g g g*, part of which screws and screw-holes only are used at one time, the others being held in reserve until the first have become useless from wear. G represents the lower adjustable extension of the center rod C, consisting of a stem, G, adjustable by means of a crotched upper end, *q*, by means of screws, bolts, or pins to the center-rod, or the adjoining part of the cross-bar. The lower end of the stem ends in a double-armed cutter, *v v*, each arm ending in a cutting-point sloping forward and downward, similar to the point of a plow. K K represent the removable bits, one belonging to each division of the tube, made of steel and forming the spiral cutting-edge of the auger, which projects toward the center of the same, and also forming the edge or vertical cutting part *s* of each division at the juncture of the latter. The points *i i*, or terminal points of the divisions, I make to extend in a tangent from the surface of the tube for a short distance, or enough to prepare a bore that will allow the tube to rotate freely. The bits are fastened to the spiral end of the respective divisions A A by means of countersunk screws, the vertical or outer cutting-edge *s s* of each being fastened in a similar mode to the respective vertical edges of said divisions, all for the purpose of removal for sharpening, or renewal. L represents the two-leaved valve, circular in shape, pivoted together on a cross-rod, *u*, each end of which enters adjustably respective holes *w w* in each division of the auger, just above or near the upper end of the bits K. I make the tube of boiler-iron of from one-eighth to one-fourth inch thickness, according to the caliber of the auger.

The operation of this invention is as follows: For ordinary soil, free from stratified rock or bowlders, the auger is used without the advanced bit G, the spiral interior conveyers or shelves *d d*, and the valve L. For heavy soil, as "hard-pan," &c., or coarse gravel, the advance-bit G is attached by means of its jaw *q* and pin or bolts, as, also, the conveying-shelves *d d*. When a bowlder is encountered one of the divisions A is entirely removed, together with the extension-bit G, thus enabling the half-auger to pass the obstruction.

The advantages of this auger are various: First, in loosening and raising bowlders of from seven to twelve inches in size, which fact is dependent entirely upon the vertical division

of the tube, and the use of one-half alone in passing or extricating such stones, so preventing the abandonment of the work, ordinarily the case when such obstructions are met with. Second, in the use of the removable bits K and the tangential points *i i*. Third, in the use of the advanced bit G to prepare the way for the auger in hard soil and facilitating its penetrating power. Fourth, in the use of a double-leafed valve or horizontal disk to bring sand or mud to the surface of the earth.

What I claim as my invention is—

1. The pods A A, provided with screw-fastenings *g g*, and auxiliary hooks and staples *k l*, in combination with braces D E and center rod C, substantially as and for the purposes described.

2. The earth-auger with divisions A A, attaching-plates *e e*, screw-fastenings *g g*, braces D E, removable bits K K, bit-extensions *d d*, and extension center-bit U, substantially as and for the purposes described.

3. The combination, with the auger-halves A A and their bits K K, the spiral shelves *d d*, for the purpose of extending said bits upward to raise minerals into the tube and relieve the bits from extra weight, substantially as described.

In testimony that I claim the foregoing earth-auger I have hereunto set my hand this 12th day of May, A. D. 1876.

FRANKLIN D. HUBBARD.

Witnesses:

CHARLES BRUNNER,

RICHARD O. EVANS.