# J. P. SUMMERS.

## Earth-Auger.

No. 165,376. Patented July 6, 1875.

Fig. 1.

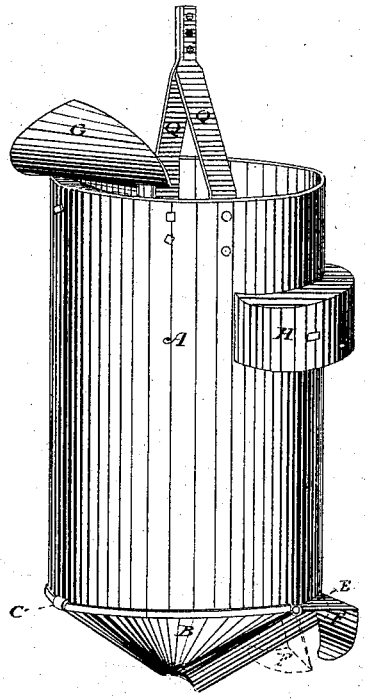



Fig. 2.

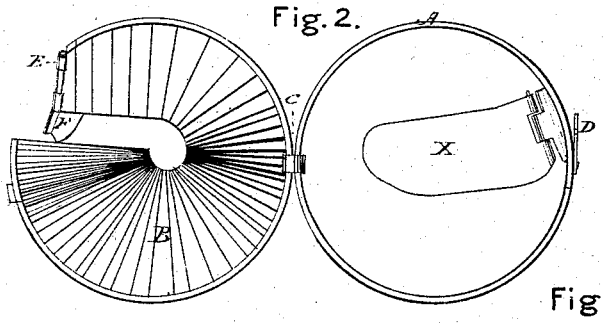



Fig. 3.

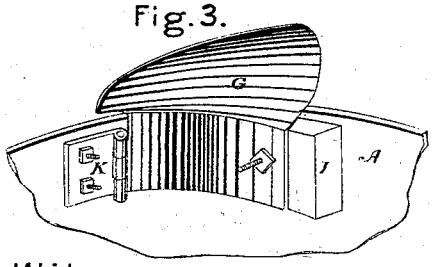
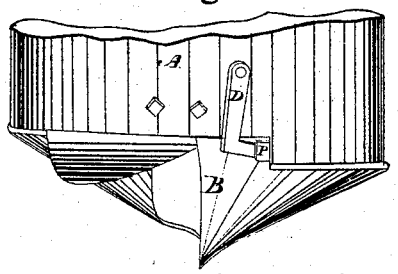



Fig. 4.




Witnesses:

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# UNITED STATES PATENT OFFICE.

JOHN P. SUMMERS, OF TIFFIN, OHIO.

## IMPROVEMENT IN EARTH-AUGERS.

Specification forming part of Letters Patent No. **165,376**, dated July 6, 1875; application filed May 24, 1875.

*To all whom it may concern:*

Be it known that I, JOHN P. SUMMERS, of Tiffin, in the State of Ohio, have invented an Earth-Boring Auger, of which the following is a specification:

The object of my machine is to rapidly bore holes in the ground, of any size, for wells or other purposes; and the following is a full description of the same, reference being had to the accompanying drawing and letters of reference marked thereon, of which—

Figure 1 is a perspective view of my invention. Fig. 2 is a view of the bottom of the cylinder, with the bit B or bottom of the cylinder open. Fig. 3 is a view of the movable reamer and conveyer, showing the manner of connecting it to the top of the cylinder. Fig. 4 is a view of the hook which fastens the bottom or bit B to the cylinder, and showing its manner of connection.

A, Fig. 1, is a cylinder, the same as used in my invention granted by Letters Patent 14th September 1869, No. 94,923. B represents a bit made of one piece of steel, in an oval form, with gain-twist, and fastened to the cylinder by a hinge, C, on one side, and a hook, D, on the opposite side, forming the bottom of the cylinder. When unfastened, the bit B swings down and opens. Near where the cutting part of the bit B is hooked to the cylinder there is a bend, which projects beyond the line of the cylinder, for the purpose of making a hole larger than the cylinder, thereby leaving a passage for the air or water to pass down on the outside of the cylinder, thus preventing any suction in hoisting.

When working in quicksand, or where it is necessary to use pipes or tubing to keep the hole open, I attach a small self-adjustable bit, F, by a hinge, to the bit B on the upper side and near one edge, pressing against the bottom of the cylinder when in operation. The cutting part of this self-adjustable bit F extends enough beyond the line of the cylinder to cut a hole large enough to allow the pipes to be lowered on the outside of the cylinder, and falls down completely out of the way of the pipe in hoisting and passing up through the same. This self-adjustable bit F is made of steel, but is flat upon the upper side. The lower part is in the scoop form.

In the inside of the cylinder A, attached to the side near the bottom by a hinge, and which, when shut, covers the opening in the bit B, is a valve, X, Fig. 2. This valve I attach when boring in quicksand, or where there is water. It allows sand and water to come into the cylinder, but none to pass out.

Near the top on the inside of the cylinder I fasten, by a hinge, the movable steel reamer and conveyer G. Being movable, it can be made to cut any amount to the full size of the scoop by bolting different thicknesses of blocks between it and the inside of the cylinder. The scoop shape of this reamer and conveyer carries all that it cuts directly into the cylinder, which is a great improvement over the knife now in use, as the latter allows the earth to drop down on the outside, and often clogs up the hole. Upon the opposite and outside of the cylinder I attach a block, H, which extends around about a third of the circumference of the cylinder A, and about a third of the length of the cylinder down from the top. This block may be of any thickness, and is so constructed as to push the auger over and cause the movable reamer and conveyer G to make a deeper cut. This block H is fastened to the cylinder by rods running through it, and held by nuts in the inside of the cylinder. The heads of the bolts are sunk into the blocks so as to be even or below the surface. By using a cylinder of sixteen inches in diameter, I can cut with my reamer and conveyer G a hole twenty-four inches in diameter.

The operation of my invention is as follows: I first use the bit B with the cylinder A. Power being applied to the arms Q Q in the usual manner, as the cylinder revolves the bit B grapples or bores down. The soil is forced around through the gain-twist into the cylinder. When full it is raised, the bottom unfastened by moving the hook D out of the eye P in the bit B, and the bottom swings down and open, letting the contents of the cylinder pass out. To make the hole larger, I attach the movable reamer and conveyer G, regulating it in the manner hereinbefore described. As the

cylinder revolves, the toe end or cutting part of the reamer and conveyer is forced into the ground around the cylinder, cutting the same and throwing it into the cylinder. To make the hole still larger, the block H is attached as hereinbefore described. This forces the cylinder over against the opposite side, causing the movable reamer and conveyer G, when the cylinder is revolved, to make the second cut. To make the hole larger, I put on a thicker block and proceed as before described. With blocks of this description, I can cut a hole of any size.

In quicksand and water I use the extra single small self-adjustable bit F and valve X, the self-adjustable bit F cutting beyond the line of the cylinder enough to allow piping to be lowered at the same time. In raising the cylinders the valve X closes, and the self-adjustable bit F folds in and passes through the pipe, spreading out again when the cylinder is lowered and commences cutting. The bit B of my auger, being made in an oval form, with gain-twist and open center, prevents all pivoting on stones, &c., which is a great improvement over those now in use.

I claim as my invention—

1. A movable reamer and conveyer, G, hinged to the bucket at one end, and adjusted by blocks I and bolts, substantially as herein set forth and described.

2. Any number of movable blocks H, attached to the sides of the cylinder, substantially as described.

3. The hinged bit B, secured by hook D and eye P to the bucket A, constructed substantially as herein described.

4. The small self-adjustable bit F and valve X, substantially as herein described.

5. The combination of the cylinder A, bit B, movable reamer and conveyer G, movable blocks H, small self-adjustable bit F, and valve X, substantially as and for the purposes herein set forth and described.

JOHN P. SUMMERS.

Witnesses:

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