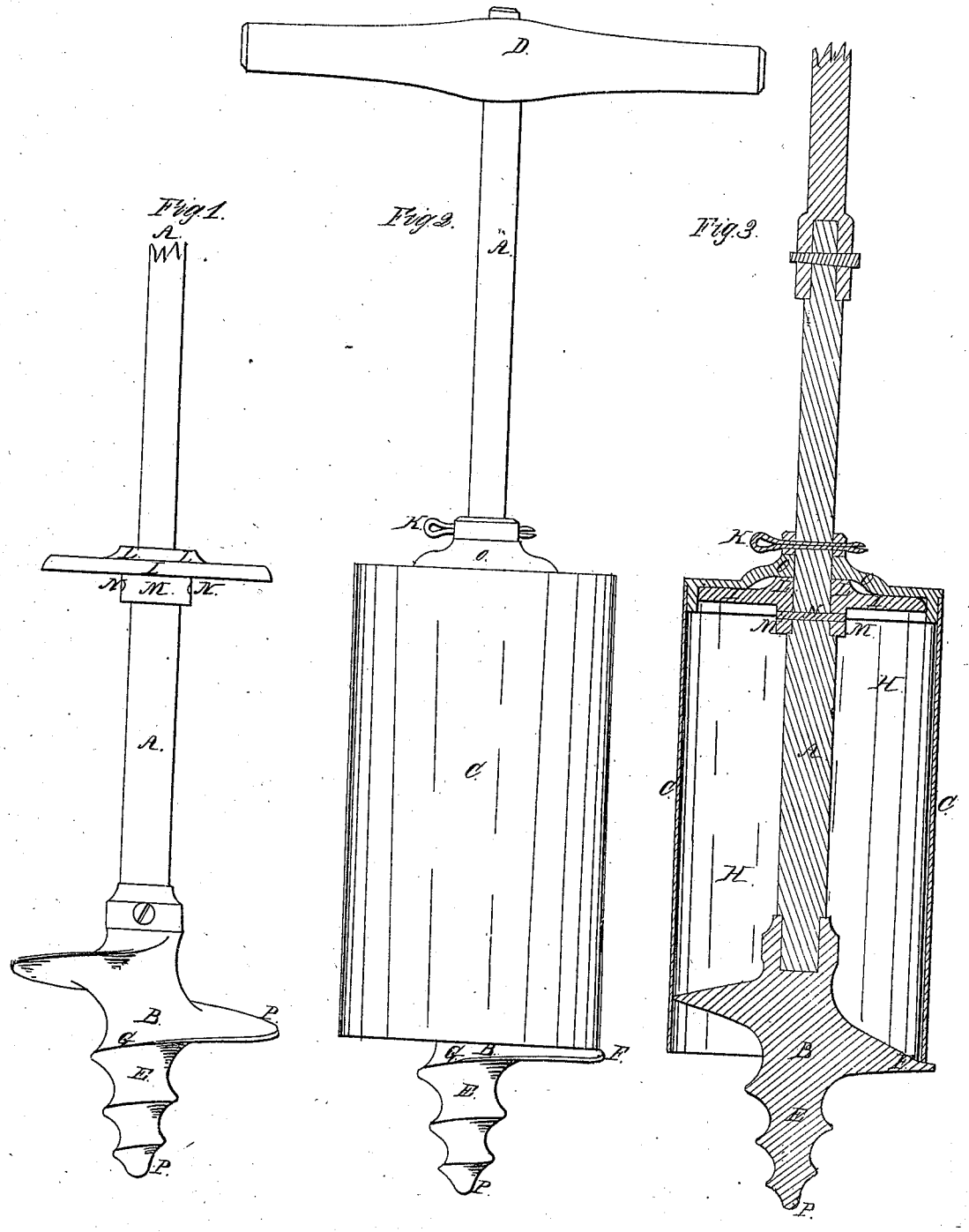
P. Dow.

Earth Auger.

No. 6,970. Patented Dec. 25, 1849.



THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

PHINEHAS DOW, OF PHILADELPHIA, PENNSYLVANIA.

EARTH BORER AND ELEVATOR.

Specification of Letters Patent No. 6,970, dated December 25, 1849.

To all whom it may concern:

Be it known that I, PHINEHAS DOW, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful machine for boring the earth, and raising to the surface in a cylinder by one operation whatever is displaced by the process of boring; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a perspective view of the machine in readiness to operate; Fig. 2, a perspective view of the shaft auger and circular plate; and Fig. 3, a sectional view of the machine.

This machine consists of two principal parts, with other subordinate parts necessary for the more convenient and perfect operation of the machine. The shaft or spindle or rod A, with the excavating and cutting auger or borer B, attached, and the cylinder C, inclosing the lower part of the spindle or shaft and in which whatever is displaced by the process of boring is raised to the surface; are the two main parts of the machine.

The shaft or spindle or rod A, is made of any convenient size and of any metal or wood sufficiently strong; and is made in convenient lengths, for the purpose of operating at greater or less depths as occasion may require, these lengths being fastened together either by a square socket and pin, or by male and female screws cut upon the upper and lower ends of the lengths, or in any way which makes the connection sufficiently firm; the upper or topmost length having a socket or ring at its upper end, through which may pass a handle or lever D, by which the rod and the auger at its lower extremity may be turned, or a handle D, may be fitted to the upper length in any ordinary and firm way.

Upon the lower end of the shaft A, is the auger or borer B, made of steel or other metal of sufficient strength, and attached to the rod, either by a square socket and pin, or by male and female screws cut upon the end of the shaft and upon the upper and center portion of the auger or in any other sufficiently firm way, as in the case of the separate lengths forming the rod. This auger or borer consists of a spiral bit E, and thread F, very similar to those of an ordinary auger, but the thread of it is shorter, as will hereinafter appear; its lip or cutting edge G, is made slightly projecting beyond the lower rim of the cylinder C, hereinafter described, and this lip may be also slightly turned up over and outside of the rim of said cylinder; the object of this projection being to cut the hole so much larger than the cylinder, that the latter will sink in the hole without difficulty or friction; the thread F, of the auger or borer, from the lip at the rim of the cylinder, extends within and inclosed by the cylinder only to the length of between one and two turns of the thread, where the auger ceases, leaving the remaining space H, within the cylinder perfectly clear and unoccupied for receiving and retaining the earth or whatever is excavated, except only by the shaft or rod, and by the circular plate I, fixed to the shaft near the top of the cylinder, and which is hereinafter described; the thread being after it enters the cylinder of such a size as just to fit its inner surface without friction; the bit E, may be of any convenient length, but I have found the length of one half the diameter of the cylinder to be about the proper proportion.

The cylinder C, is made of any metal or wood which is strong enough to bear the weight of the earth to be raised; its length and diameter should be proportioned to the difficulties of working and the weight of the soil to be raised, and also to the quantity of soid it is wished to raise at any one operation; this cylinder is open at the bottom, except as filled with the thread of the auger or borer; at the top it may be either closed, with the exception of an aperture in the center of no greater size than is necessary to allow the shaft to pass through and be easily turned around or moved vertically, without permitting any play or vibration of the shaft from a vertical position when in use, which form or arrangement of the top of the cylinder will be the best when it is desired to bore and raise soil covered with water; or, the top may be pierced with two or more holes to allow the escape of air as the cylinder becomes filled with earth; or, the top of the cylinder may be left entirely open, except such bars as may be required to strengthen the cylinder and render it firm; or, more or less of the top of the cylinder may be left open as circumstances shall ren-

der necessary or expedient. The cylinder, when the machine is in use, is kept in its proper place—(the under or lower side of its top, whether close, or with bars, or however it may be, resting upon and supported by the circular plate I, secured to the rod or spindle and hereinafter described), by a movable pin or bolt K, passing through a hole in the shaft, just above the top of the cylinder, having its ends projecting in such a way, as to prevent the cylinder moving from its place around the shaft, answering very much the same purpose as the linch-pin of a carriage.

To prevent the adhesion of the earth excavated, to the top and sides of the cylinder—its caking therein—and the consequent difficulty in removing it therefrom; a circular plate I, of metal or wood (being the circular plate hereinbefore referred to) is attached to the shaft just within the top of the cylinder, its diameter being such that its rim nearly touches the inner surface of the cylinder; the upper surface of this plate immediately around the shaft is slightly raised, as shown at L, and it is intended that the top O, of the cylinder, when the machine is in use, shall rest upon this slightly raised part, so that when the movable pin or bolt K, is put through the hole in the rod just above the top of the cylinder, the latter is kept firm in its position; upon the under or lower surface of this circular plate, immediately around the shaft is a collar M, through which passes a pin or bolt or screw N, firmly securing the plate to the shaft.

This machine may be used either where the surface of the earth is covered with water, or where it is dry; in the former case the top should be closed; in the latter it may be closed or not as convenience requires. It may be worked by hand, or by hand aided by machinery and mechanical contrivances, or by machinery alone according to the size of the machine, the nature of the earth or whatever is to be excavated, and the quantity of earth it is wished to raise at one time; and when it is operated by hand aided by machinery and mechanical contrivances, or by machinery alone, any or all, or any part of the appliances used in boring Artesian wells, or any of the usual combinations of the mechanical powers as applied to boring machines, may be adapted to, and used in connection, with my machine; and any pulleys, ropes or tackle of any kind, may, if the machine be so large as to require them, be adapted to raising the cylinder when filled with earth, to the surface, and for raising it, when there, from around the auger or borer and the lower part of the shaft, by fitting said ropes &c. to hooks or staples in the top of the cylinder.

It being now wished to operate the machine by boring the earth and raising to the surface whatever is displaced by the process of boring; the cylinder C, is placed in its position, its top O, resting upon the circular plate I and its lower rim just above (but not touching) the lip G, of the auger, and the movable pin or bolt K, is put through the hole in the shaft or rod, just above the top of the cylinder; the point P, of the bit, being then placed on the ground, the shaft A, is turned around and at the same time pressed down by the handle D, at the top, the motion communicated to it, being the same with that given to a common auger; when, now, the lip or cutting part G, of the auger B, comes down to the earth, it cuts or excavates or scoops out the earth, and whatever it excavated or bored out, passes up into the cylinder along the inclined plane of the thread of the auger, as the chips of wood cut by a common auger in boring wood pass along the groove made by its thread; when the cylinder is full, the whole machine being drawn up to the surface of the ground, or water (if the ground is covered with water), the movable pin or bolt K, is withdrawn, and the cylinder being raised vertically upon the shaft, whatever has been received into the cylinder in the process of boring, falls to the ground, or into the boat or scow (if the ground is covered with water), or upon or into whatever is the platform or support on which the workmen stand and from which the machine is operated; the substance received into the cylinder being prevented from remaining therein, as it is raised up on the shaft by the circular plate I.

Having thus fully described the nature and operation of my machine for boring the earth and raising to the surface in a cylinder by one operation, whatever is displaced by the process of boring; what I claim as new therein, and desire to secure by Letters Patent is—

The combination of the auger and the circular plate I, fixed upon the same shaft with the cylinder C, which does not revolve with the shaft, and may be moved along it; by which I dispense with the force necessary to turn the cylinder, and empty out the excavated material in an easier manner than has heretofore been practiced.

PHINEHAS DOW.

Witnesses:

SAML. C. PERKINS,

JAMES WHITAKER.