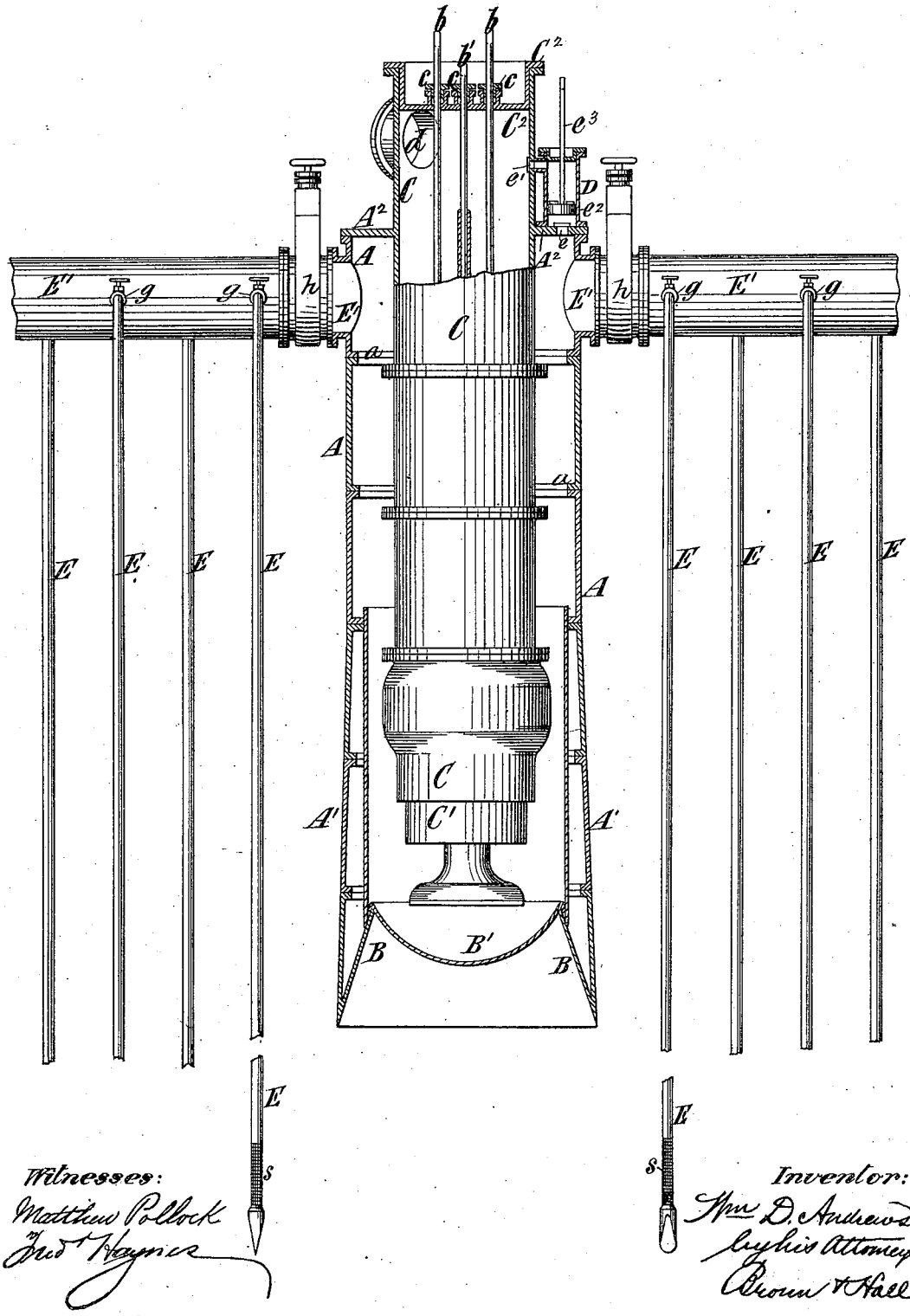
(No Model.)

W. D. ANDREWS.

MEANS FOR PROCURING WATER FROM THE EARTH.

No. 306,803. Patented Oct. 21, 1884.



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WILLIAM D. ANDREWS, OF BROOKHAVEN, NEW YORK.

MEANS FOR PROCURING WATER FROM THE EARTH.

SPECIFICATION forming part of Letters Patent No. 306,803, dated October 21, 1884.

Application filed February 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. ANDREWS, of Brookhaven, in the county of Suffolk, in the State of New York, have invented a new and useful Improvement in Means for Procuring Water from the Earth, of which the following is a specification.

In my application for United States Letters Patent filed February 25, 1884, and the serial number of which is 122,026, I have shown and described means for procuring water from the earth, which comprise a main well consisting of an air-tight cylinder or tube sunk below the level of the water in the earth, and having water-inlet openings at its lower part, a number of supplemental drive-wells connected with the upper portion of said main well, a main pump extending downward through the closed upper end or top of the main well to a point below the level of water therein, and serving to deliver from the main well the water entering thereinto through the openings in its lower portion and from the several supplemental wells, and an air pump or auxiliary pump having its suction connected with the top of the main well, and its discharge connected with the discharge of the main pump, said auxiliary pump serving to keep the main and supplemental wells free from air and working water when no air is there present. When a large volume of water is required, a large number of small drive or tube wells are more effective than a large well having water-inlet openings in the lower portion, and for this reason I may sometimes employ a reservoir sunk in the ground and receiving water from numbers or series of drive-wells connected with its upper part, in combination with a pump for delivering water from said reservoir; and to this end my invention consists, essentially, in the combination, with a reservoir consisting of an air-tight cylinder sunk in the earth and a number of drive-wells connected with the upper part of said reservoir, of a pump for delivering from said reservoir the water entering into it from said drive-wells, all as more fully hereinafter described.

The accompanying drawing represents a partly-sectional elevation of apparatus embodying my invention for procuring water from the earth.

A designates the reservoir, which may consist of cylindric cast-iron sections united by flange-joints *a*, and having its lower portion, A′, slightly flaring and closed at the bottom by an upwardly-contracted shoe, B, and a bottom, B′, secured thereto. This reservoir is very similar to the well described in my aforesaid application, Serial No. 122,026, save that it is imperforate throughout.

The cylinder A is closed by a head, A^2, through which a pump cylinder or casing, C, extends downward to near the bottom of the well and below the level of water therein. At or near the lower end of the cylinder or casing C is a working-barrel, C′, which is preferably removable and smaller than the interior of said cylinder, so that it may be introduced downward through the cylinder C when necessary, and removed therefrom by a reverse movement when desired. In said working-barrel C′ are two valvular pistons, the upper of which is connected with and operated by the piston-rods *b b*, and the lower of which is connected with and operated by a single piston-rod, *b*′. These piston-rods *b b b*′ work through stuffing-boxes *c* in the upper air-tight head, C^2, and just below said head and above the closed head A^2 of the cylinder A is a discharge-pipe, *d*.

D designates an air-pump or auxiliary pump, having a suction-opening, *e*, communicating with the top of the well A, a discharge-opening, *e*′, communicating with the upper part of the pump-cylinder C, and thence communicating with the discharge *d* and a valvular piston, e^2, operated by a piston-rod e^3.

The piston-rod *b b b*′ may be operated by any suitable mechanism which will move the two pistons simultaneously toward and from each other in the working-barrel C′, and a desirable form of mechanism for such purpose, and for working the piston e^2 of the air-pump D, is shown and described in my aforesaid application, Serial No. 122,026.

The air or auxiliary pump D, operating continuously, serves to keep the reservoir A free from air, and when no air is therein the pump D will work water and discharge it into the main pump-cylinder C.

The construction and mode of operation of the pump C C′ are fully described in my ap-

plication for United States Letters Patent filed February 25, 1884, and of which the serial number is 122,023, and no further explanation thereof is here necessary. Any suitable pump may be substituted for that here shown.

E designates drive or tube wells, the lower perforated portions of which are protected by strainers *s*, and a number of which are connected in an air-tight manner with the cylinder A. As here shown, main pipes E′ extend from the well-cylinder A, and the drive-wells E are connected alternately with opposite sides of said pipes E′, and are each provided with a valve, *g*, whereby communication with the main pipe E′ may be cut off when desired. In each main pipe E′, near its point of connection with the cylinder A, is a straight-way or sluice valve, *h*, which may be closed when desired to cut off the pipe E′ and all its small wells E from said cylinder.

As represented in the drawing, the reservoir A is supplied by two main pipes, E′, and two gangs of wells, E; but three or more of said main pipes may be employed.

The valves *g* afford provision for cutting off any one of the wells E from its main pipe, and the valves *h* afford provision for cutting off either pipe E′ from the reservoir A.

When the reservoir A and drive-wells E are exhausted of air, a siphon-like action will take place, each drive-well E forming one leg of a siphon, and the space between the pump-cylinder or casing C forming the other leg thereof.

All the wells E and main pipes E′ deliver into the reservoir A, and from the reservoir the water is delivered by the pump.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with an air-tight reservoir sunk in the earth, of tube or drive wells having an air-tight connection with the upper portion of said reservoir, and delivering their water thereinto, and a pump for delivering water from said reservoir, substantially as herein described.

2. The combination, with an air-tight reservoir sunk in the earth, of tube or drive-wells having an air-tight connection with the upper portion of said reservoir, and a pump extending downward through the closed head of said reservoir and below the level of water therein, substantially as herein described.

3. The combination, with an air-tight reservoir sunk in the ground, of drive-wells connected with the upper part of said reservoir, a pump for delivering water from said reservoir, and an air-pump connected with the top of the reservoir for exhausting air from said reservoir and wells, substantially as herein described.

4. The combination, with an air-tight reservoir, A, sunk in the earth, of a pump extending downward through the closed head of the reservoir, and having a discharge-pipe above said head, a number of drive-wells connected with the upper part of the reservoir, and a continuously-operating air-pump or auxiliary pump having its suction and discharge-openings communicating, respectively, with the upper part of the reservoir and the discharge of the main pump, substantially as herein described.

5. The combination, with an air-tight reservoir sunk in the earth, of a pump for delivering water therefrom, a main pipe extending from the upper part of said reservoir, and a number of drive-wells connected with said main pipe, substantially as herein described.

6. The combination, with an air-tight reservoir sunk in the earth, of a pump for delivering water therefrom, a main pipe, E′, and drive-wells E, connected with the main pipe, and severally provided with valves *g*, substantially as herein described.

7. The combination, with an air-tight reservoir sunk in the earth, of a pump for delivering water therefrom, main pipes E′, severally provided with valves *h*, and drive-wells E, connected with said main pipes, substantially as herein described.

8. The combination of the air-tight reservoir A, sunk in the earth, a pump for delivering water therefrom, and main pipes and drive-wells E′ E, provided with valves *h g*, substantially as herein described.

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