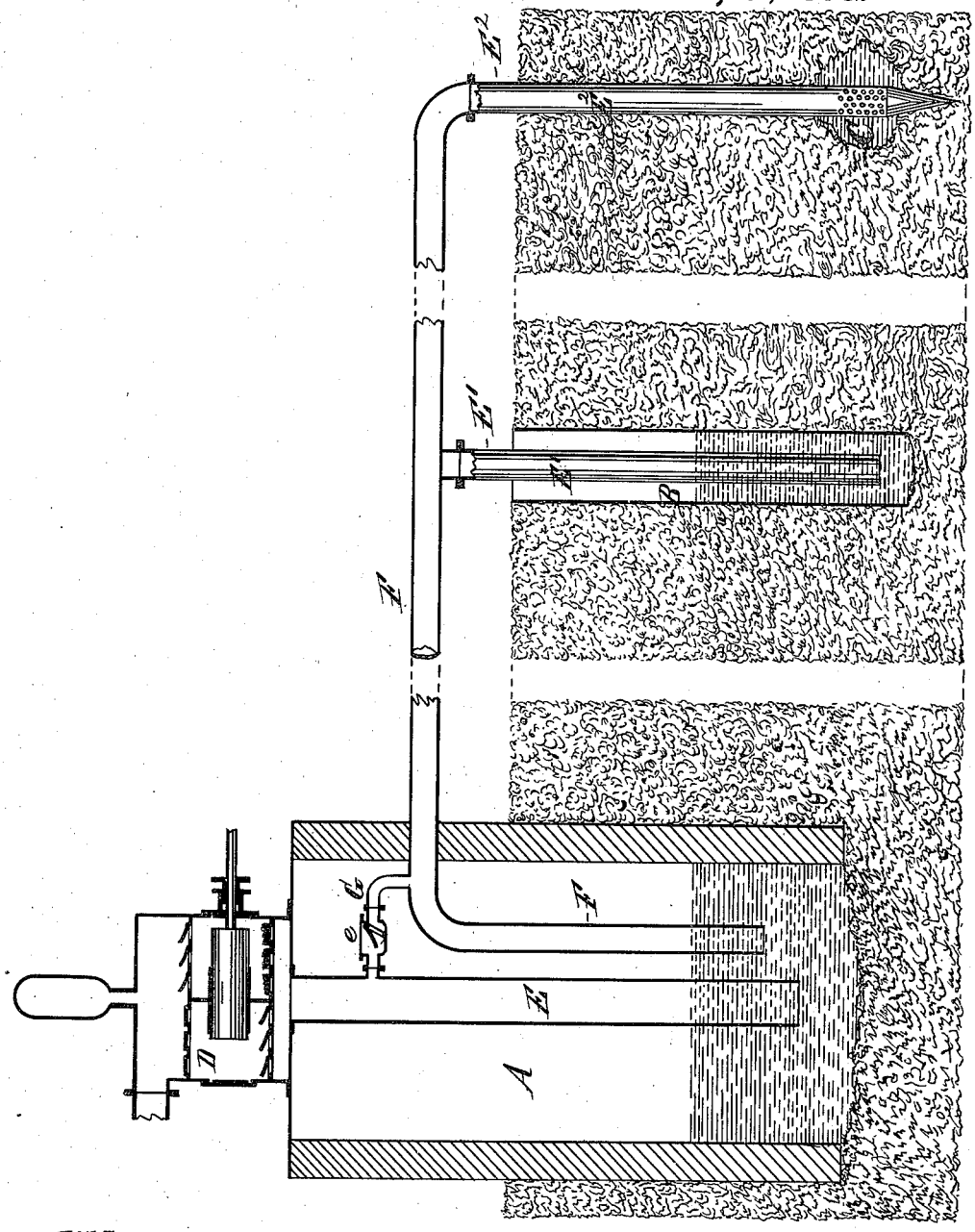
W. E. WORTHEN.

Hydraulic Connections for a Series of Wells or Cisterns.

No. 205,779. Patented July 9, 1878.



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WILLIAM E. WORTHEN, OF NEW YORK, N. Y.

IMPROVEMENT IN HYDRAULIC CONNECTIONS FOR A SERIES OF WELLS OR CISTERNS.

Specification forming part of Letters Patent No. 205,779, dated July 9, 1878; application filed May 31, 1878.

To all whom it may concern:

Be it known that I, WILLIAM EZRA WORTHEN, of the city, county, and State of New York, have made a new and useful Invention of Hydraulic Connections for a Series of Wells or Cisterns; and that the following is a full, clear, and exact description and specification of the same.

It frequently happens in practice that two or more wells or cisterns, or one or more wells in connection with one or more cisterns, are required to furnish a supply of water for one establishment; and the objects of this invention are to enable the several supplies of water from different sources to be combined without the necessity of sinking connecting-pipes to the low levels of the sources of supply of water; also, to dispense with the necessity of operating-cocks or other means of regulating the supply from each source; and, further, to enable the quantity of water supplied by the several sources to regulate the quantity drawn from each severally.

To this end my invention consists of certain combinations of suction-pipes with a siphon-pipe and with a single pump suction-pipe, as are specified in detail at the close of this specification.

In order that the said invention may be fully understood, I have represented in the accompanying drawings, and will proceed to describe, the mode in which I have embodied my said invention in practical form.

This drawing gives as an example the application of the invention to a case in which a large or main open well, A, of the ordinary construction, is employed in connection with a smaller auxiliary open well, B, and with a driven well, C, acting also as an auxiliary to the main well. A single pump, D, is in this case applied to draw water from the three wells, and its suction-pipe E is in this case applied directly to the main well A.

The two auxiliary wells B and C are each fitted with a separate suction-pipe, E^1 and E^2, and these auxiliary suction-pipes are combined with the siphon-pipe F, which extends into the main well A, with which the suction-pipe E of the pump communicates.

The siphon-pipe F is combined at its uppermost part with the pump suction-pipe E by means of a small connection, G, and this connection G is by preference fitted with a check-valve, *e*. The lower end of the siphon-pipe F in the main well and the lower ends of the auxiliary suction-pipes E^1 E^2, combined with the siphon-pipe F, extend downward in their respective wells to the lowest level from which water is to be drawn.

In a combination of suction and siphon pipes in wells, as above described, the operation of the pump exhausts directly the main suction-pipe leading into the main well, and also exhausts the siphon-pipe F and the auxiliary suction-pipes E^1 E^2 through the connection G. On the other hand, when the pump is at rest and the siphon and auxiliary suction-pipes are free of air, the water from the auxiliary wells B C will siphon over into the main well whenever the level of the water in the latter is lowest, and the siphoning will continue until the levels of water in the wells will be equalized. The water so siphoned is drawn from the main well through the main suction-pipe E, so that the latter acts in combination with the auxiliary suction-pipes and siphon-pipe to supply the pump D with water drawn originally from the auxiliary wells; and this is the case even if the connection G be not used. If air should get into the siphon-pipe F when the connection G is employed, and should interrupt such siphoning before the levels are equalized, the first action of the pump will remove such air through the connection, and consequently, whenever the action of the pump is stopped, the siphon-pipe and auxiliary suction-pipes are left freed of air and in the condition required to transfer the water from the auxiliary wells to the main well. If the pump-pipe, pump, and its valves are tight, the check-valve in the connection G is not necessary; but in practice it is deemed advisable to use it as a precaution against the return of air.

In place of connecting the highest part of the siphon-pipe with the same pump D which is used to raise the water from the main well, a special pump or an ejector may be employed to free the siphon-pipe from air, the connection with the suction-pipe of the raising-pump being then unnecessary.

The advantages incident to this system are

that one or more auxiliary wells situated at considerable distances from the main well may be combined and utilized to furnish the supply drawn by a pump, and yet the connections between the various wells may be practically about twenty-five feet above the lowest level of the water in the auxiliary wells, thus avoiding the necessity and expense of sinking the connecting-pipes down to the lowest level from which water is to be drawn from the auxiliary wells. The connection of the suction-pipes of auxiliary wells with a main well by means of a siphon-pipe also permits the water to be drawn slowly from the auxiliary wells, so that a sudden rush of water into them and the consequent disturbance of the earth surrounding the bottom of the well are avoided, because the suction-pipe of each auxiliary well may be made of such small size as to pass the water slowly, while the quantity of water accumulated in the main well will be sufficient to supply the pump rapidly when it is worked. If sand should, however, be drawn from the auxiliary wells, the small size of the connection G permits but a small quantity of the soiled water to pass directly to the pump, while the residue is delivered into the bottom of the main well, where time and space are afforded for settling. The use of the connection G between the pump suction-pipe of the main well and the siphon-pipe is advantageous, because it enables the siphon-pipe and the auxiliary suction-pipes to be cleared of air by the same pump which is used to draw water from the main well, thus dispensing with the necessity of using a special pump or other device to exhaust the siphon-pipe.

Although I have described the invention as applied to combine wells, it is obvious that it may be applied to combine two or more cisterns for holding water (such cisterns taking the places of the wells) or to combine a cistern and a well.

I claim as my combination—

1. The combination of several wells by means of a suction-pipe in each auxiliary well and a siphon-pipe in the main well combined, substantially as before set forth.

2. The combination, substantially as before set forth, of the main and auxiliary wells with a single pump by means of the suction-pipe of the main well, a suction-pipe for each auxiliary well, and the siphon-pipe delivering into the main well.

3. The combination, substantially as before set forth, of the suction-pipe of a main well, the auxiliary suction-pipe, the siphon-pipe, and the connection between the main suction-pipe and the siphon-pipe.

Witness my hand this 23d day of May, A. D. 1878.

WILLIAM EZRA WORTHEN.

Witnesses:
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ROBERT BUYERS.