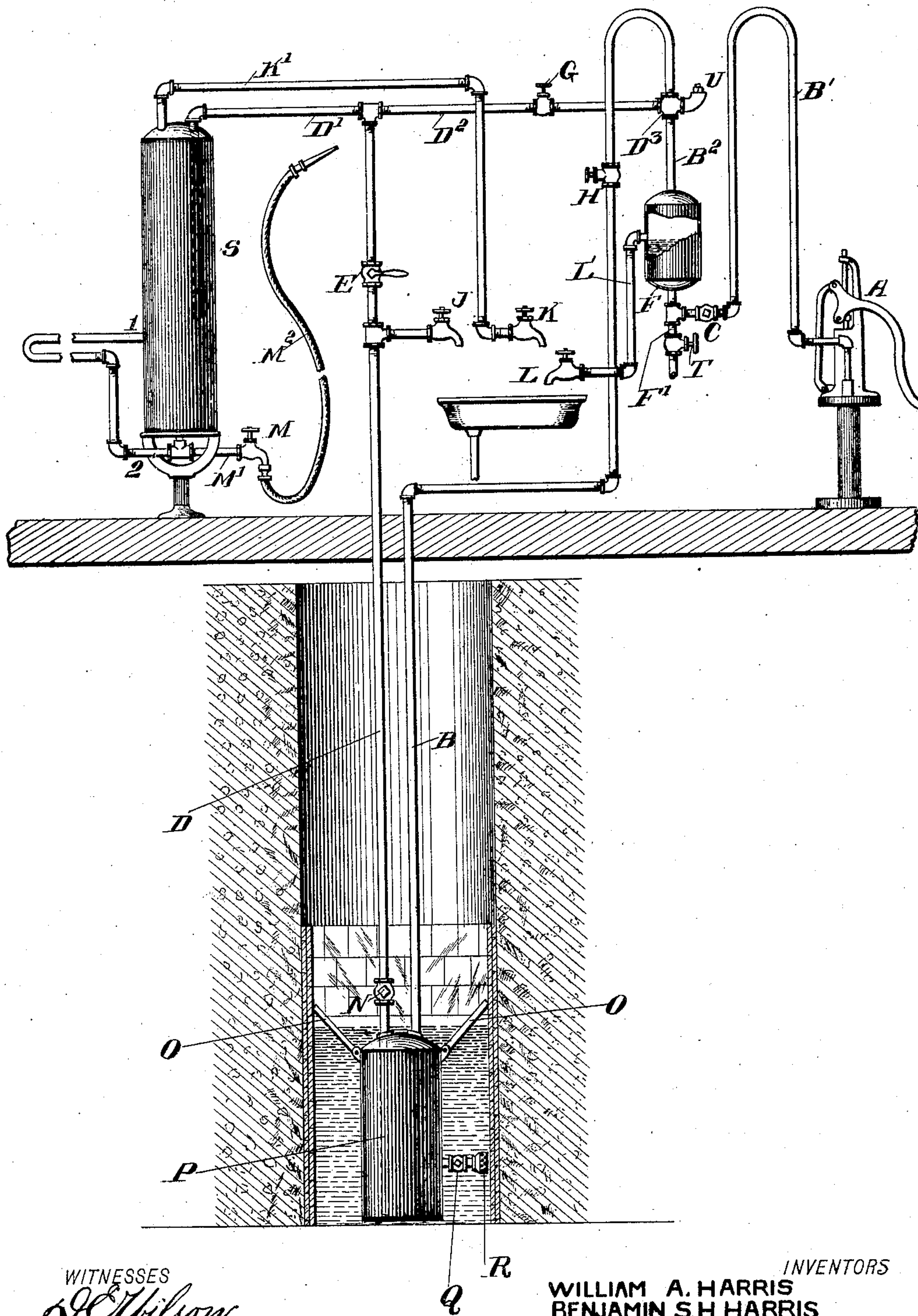


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W. A. & B. S. H. HARRIS.
PNEUMATIC WATER LIFT.
APPLICATION FILED JUNE 15, 1906.



WITNESSES

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WILLIAM A. HARRIS AND BENJAMIN S. H. HARRIS, OF GREENVILLE, SOUTH CAROLINA, ASSIGNORS OF FOUR-SIXTEENTHS TO J. C. FITZGERALD AND ONE-FOURTH TO J. P. CARLISLE, OF GREENVILLE, SOUTH CAROLINA.

PNEUMATIC WATER-LIFT.

No. 844,936.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, WILLIAM A. HARRIS and BENJAMIN S. H. HARRIS, citizens of the United States, and residents of Greenville, in the county of Greenville and State of South Carolina, have invented certain new and useful Improvements in Pneumatic Water-Lifts, of which the following is a specification.

This invention is an improvement in pneumatic water-lifts, and has for an object to provide a novel construction by which the water may be elevated by pneumatic pressure and which may be utilized as a fire-extinguisher when so desired; and the invention consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawing the figure is a side elevation, partly in section, of an apparatus embodying our invention.

In carrying out the invention we provide in the well or other source of water-supply a tank P, having a water-inlet controlled by a strainer R and an inwardly-opening check-valve Q. This tank is provided at its upper end with stay-bars O, pivoted at their inner ends to the tank and arranged at their outer ends to bear against the wall of the well, and thus brace the tank in position. An air-pipe B and a water-pipe D connect with the tank and extend upwardly therefrom, the water-pipe projecting down into the tank, as shown, and being provided a short distance above the tank with the upwardly-opening check-valve N. This pipe D extends above the floor or ground line and is provided with a discharge-pipe having a faucet J and above the said pipe and faucet with a stop-cock E and is provided above the stop-cock E with a branch D', extending to and opening into the water tank or reservoir S. By a proper manipulation of the valves and stop-cocks and the operation of the pump, presently described, water may be forced from the lower or supply tank into the upper or reservoir tank or be dispensed therefrom, as may be desired. The reservoir-tank S is also provided with a hot-water pipe K', provided with a faucet K, and suitable means at 1 and 2 may be provided for heating the water in the reservoir S, and a discharge-pipe M', having a faucet or valve M, may be utilized in connection with a hose M² for use as a fire-ex-

tinguisher, as will be understood from the drawing. The branch pipe D', as well as the upper end of the pipe D, communicates, through a suitable T, with a branch pipe D², having an emergency-valve G and united by a coupling D³ with the branch pipe B² of the air-pipe B, leading to the upper end of a purifier or filter F and also with the upper end of the air-pipe B, such pipe B being supplied with an intermediate valve H. The purifier is in the form of a tank adapted to hold water and is provided with a discharge-pipe L', having a faucet L, the several faucets J, K, and L being preferably arranged in close proximity and arranged to discharge to the same sink, as shown, and the purifier is normally supplied with water to a level slightly below the connection of the pipe L' therewith. This purifier F has the discharge-pipe F' supplied with the valve T, and to this discharge-pipe above the valve T we connect the pump discharge-pipe B', having a check-valve C, opening toward the filter and arranged to be supplied with air from the pump A. This pump is suitably constructed for compressing air, and the air is forced from the pump through the air-filtering apparatus to the desired point. Normally the well-tank P is filled with water, which passes in through the strainer R and check-valve Q. Before the pump is operated the filter F should be filled about half-full of water. This may be accomplished by removing the plug U. The purpose of the filter is to cool and cleanse the air before it passes through the air-pipe B into the well-tank P. This pump must be ciled in order to be successfully used, and as the air heats when being compressed it is important to remove the effects of grease and heat, and for this reason we employ the filter, as without the filter the air would pass directly from the pump to the well-tank, carrying with it the bad effects of oil and heat.

In order to fill the water-reservoir S the drain-cock T, emergency-valve G, and faucets J, L, and M should be closed. The intermediate valve H, stop-cock E, and faucet K should be open, and the pump A should be operated to force air through the pipe B' and check-valve C through the water in the filter F and air-pipe B to the well-tank, the pressure of the air forcing the water through the

pipe D, through the check-valve N, and thence into the water-tank S. As the tank S fills with water the air passes out of the faucet K, and when the tank S is full the water will flow out of the faucet K, indicating that the tank is full, and such faucet can then be closed. When the well-tank P has been emptied in order to permit it to fill through the strainer R and check-valve Q, the exhaust-valve L should be opened, which permits the air to escape and pass out as the water runs into the tank. The system is now charged with water.

In order to get fresh water directly from the well, the drain-cock T, emergency-valve G, stop-cock E, and exhaust-valve L should be closed. The faucet J should be opened, and the pump should be operated to force air into the tank P, which will cause the water to flow out of the faucet J. After a portion—say one-fourth—of the water has been forced out of the water-tank P the space in the tank can be used as a storage for air, and by pumping up pressure water can be had to the extent of the excess of pressure without pumping.

When the tank S is used for hot water, the operation will be the same as before described for filling, as the forcing of cold water into the tank S will force out hot or cold water, as the case may be, through the faucet K.

In case of fire a hose may be attached to the faucet M. The stop-cock E and intermediate valve H should be closed, the emergency-valve G and faucet M opened, and the pump operated to quickly raise the pressure in the tank S to a sufficient extent to throw water on top of an ordinary house. If the water in the tank S should be exhausted before the ordinary results are accomplished, the faucet M may be closed, the hose removed and connected with the faucet J, the intermediate valve H and faucet J opened, leaving the emergency-valve G open, so as to get the benefit of pressure in the tank S, and the pump be operated to force the water out of the faucet J and the hose M² applied thereto. Lawns and gardens may be watered in like manner.

The water in the filter should be changed as often as necessary to insure pure air. This can be readily done when about one-fourth of the water is out of the well-tank P by pumping up the pressure higher than for ordinary purposes, when the intermediate valve H may be closed, the valves L and T opened, and when all the water in the filter has passed out through the drain-cock T such cock should be closed and the emergency-valve and stop-cock E opened, permitting cold water to run into the filter F until it is filled sufficiently, which will be indicated by water running out at the exhaust-valve L. The intermediate valve H may now be opened,

and the system will be ready for use, as before.

In freezing weather the water should be drained out of the filter by opening the drain-cock T, which should remain open over night. Then before again using the drain-cock T should be closed, the plug U removed, the exhaust-valve L opened, and water should be poured in until it runs out of exhaust-valve L, when the plug U may be replaced, the exhaust-valve L closed, and all will be ready for use. It will be understood that the tank can only be used for hot water when connected to a stove or range or other heating appliance in the well-known manner. When the tank S is used for cold water only, the connections 1 and 2 may be plugged.

The check-valve N, it will be understood, is placed in the water-pipe D to prevent water from passing back into the well-tank P.

It will be noticed in the improved system as described the air is directly supplied to the water in the well or other supply through the filter, which cleanses it, and the water may be caused to flow with a few strokes of the pump.

The check-valve C in the pump discharge-pipe prevents water from passing from the filter F back into the pump. Except for this check it will be noticed that a small leak in the pump will permit the water in the filter to ease back into the pump, which would be objectionable.

We claim—

1. The combination substantially as herein described of a supply-tank, a reservoir-tank, a purifier or filter tank, a pipe extending from the supply-tank to the reservoir-tank and having a discharge-faucet, a check-valve between the discharge-faucet and the supply-tank and opening toward the supply-faucet, and a stop-cock between the faucet and the reservoir-tank, a branch pipe leading from the connecting-pipe to the purifier or filter tank and supplied in advance of said filter-tank with an emergency-valve, a coupling and a plug connected with said branch pipe, an air-pipe leading from the filter-tank through the said coupling to the supply-tank and having an intermediate valve, an exhaust-pipe leading from the purifier-tank above the water-level thereof and having a faucet, a drain-pipe leading from the purifier-tank and having a drain-cock, an air-pump and an air-supply pipe leading therefrom and connected with the drain-pipe between the drain-cock and purifier-tank and having a check-valve opening toward the purifier-tank substantially as and for the purposes set forth.

2. The combination substantially as herein described, of a supply-tank, a reservoir-tank, a purifier or filter tank, a water-pipe leading from the supply-tank and having a branch connected with the reservoir-tank

and a branch leading to the purifier-tank, said last-named branch being provided with a coupling and with a valve in advance of said coupling, an air-pipe connected with said coupling and leading to the supply-tank and provided with a valve, and an air-pump having its discharge-pipe connected with the filter-tank, substantially as set forth.

3. The combination in a pneumatic water-lift system of a supply-tank, a reservoir-tank, a purifier or filter tank, connections between the filter-tank and the supply-tank, a valve in said connections, connections between the

filter-tank and reservoir-tank, a valve in said connections, an air-pump having its discharge-pipe connected with the filter-tank, and a water-pipe connecting the supply-tank and reservoir-tank and provided with a valve, all substantially as and for the purpose set forth.

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Witnesses:

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