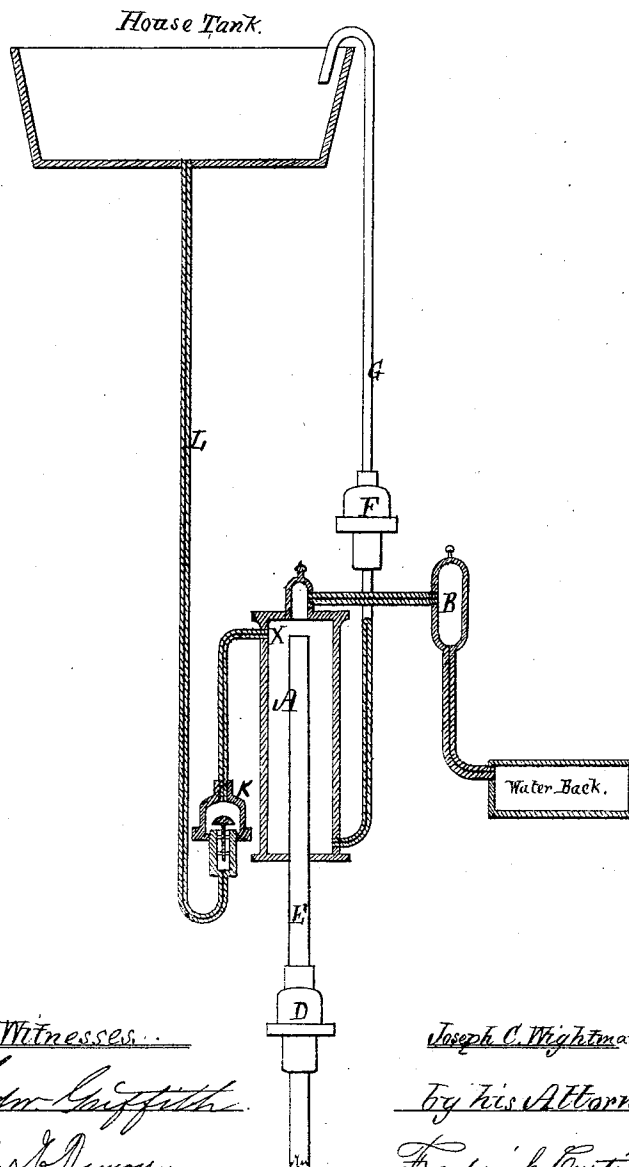


J. C. WIGHTMAN.

Steam and Vacuum Water Elevators.

No. 141,249.

Patented July 29, 1873.



Witnesses.

Edw. Griffith.

Chas. B. Ramon.

Joseph C. Wightman,

by his Attorney,

Fredrick Curtis.

# UNITED STATES PATENT OFFICE.

JOSEPH C. WIGHTMAN, OF NEWTON, ASSIGNOR, BY MESNE ASSIGNMENTS,  
TO CHARLES HOUGHTON, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN STEAM AND VACUUM WATER-ELEVATORS.

Specification forming part of Letters Patent No. **141,249**, dated July 29, 1873; application filed  
May 19, 1871.

*To all whom it may concern:*

Be it known that I, JOSEPH C. WIGHTMAN, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Steam and Vacuum Water-Elevators, of which the following is a specification:

The object of this invention is to overcome the difficulty of rendering perfectly tight the valves used in tubes or pipes designed to convey water into steam water-elevators, when such water is used for condensation, or as a supply to the steam-generator connected with steam water-elevators, and is automatically supplied; and independently supplied without reference to the water drawn from low source of supply by vacuum; and is accomplished by covering the valve placed in a pipe or tube, formed or bent as herein described, in such a position that it will at all times be covered with water, thereby forming what is known as a water-packing or a water-joint, as between the valve and the valve-seat; as also, by my device, to remove the valve as far as practicable from the action of the steam used in such an apparatus, and placing between the steam and the valve a cushion of water, which, being a poor conductor of heat, will allow the valve to retain at all times an equal temperature, thereby prolonging its duration in a perfect condition.

The drawing herein referred to, and forming part of this specification, is designed to represent the parts of a steam water-elevator, as follows:

A is the main chamber or barrel, which is filled alternately with water and steam, and from which the water is forced to the house-tank. B is a supply or supplemental chamber, containing water, which, in connection with that contained in the water-back, is to be converted into steam, and obviates the necessity of calculating the quantity of water which the water-back will hold; or of changing the water-back for a larger one, if it is found to be of too small capacity, as it is in the majority of cases. D is a foot or suction valve in the suction-pipe. E is a suction-pipe, connecting the apparatus with the well, cistern, or source of supply. F is the outlet-valve, through

which the water is forced to the tank, and closes to prevent the return of water or air which may remain in the outlet-pipe. G is the outlet-pipe from the main barrel A to the house-tank. K is the valve, opened by the pressure of the column of water contained in the condensing-pipe L. L is a pipe connected with the water-elevator and an elevated source of water, and conveys water to the apparatus for condensation and supply. X is the point of egress of the condensing water from the pipe L into the water-elevator; but such point is purely arbitrary, and in practice is governed by the mechanical convenience of making the connections.

The water-back and the house-tank are marked as such in the drawing.

The action of such an apparatus, and the operation of the device for which I desire to obtain Letters Patent, is as follows: The main chamber A, the supply-chamber B, and the water-back, as well as the various connecting and suction pipes, having been filled with water, a fire made in the fire-pot of the range or stove will shortly generate steam in the water-back and supply-chamber B. This steam, passing through the pipe connecting the supply-chamber B with the main chamber A, will exert its force on the water contained in the barrel A, and the water under this pressure will commence to move out of the barrel A up the outlet-pipe G to the house-tank. The same pressure which forces the water out of the main chamber A will be exerted upon the water lying in the short arm of the condense-pipe L over the valve K, and close, or rather keep closed, the valve K, preventing any egress of water through the aperture X. The water contained in the water-back and supply-chamber having been converted into steam, and forced the water in the barrel A out through the outlet-pipe G to the house-tank, or when the column of pressure is changed by expelling the water from a portion of the outlet-pipe G, the pressure which retained the condense-valve K closed, is reduced, and the water pressing from the house-tank or other elevated source, through the condense-pipe L, opens the valve K and injects water into the apparatus, thereby creating a

vacuum. The water at this time will open the suction-valve D and flow in from the well or cistern through the suction-pipe E and fill the apparatus. All the valves in the apparatus will then settle back, or rather close, by their own weight, and, upon the further generation of steam, each valve will operate, as before described. The condense-pipe L, being in the form of an inverted siphon, with the valve K in its shorter arm and near the bend, will always be full of water, the only point of egress for said water being at X.

By this device the valve K, if imperfectly made, or from any other cause not perfectly tight, will be rendered nearly so, as the molecules of water will not pass the leak as readily as steam, and the cushion of water above the valve K, and separating the valve K from the steam in the apparatus, prevents the continued expansion and contraction of the metal composing the valve K, and the length of time is thereby increased during which it will remain perfect, as the constant sudden expansion and contraction of any metal tends to its rapidly losing its form, and also to the final destruction of its normal consistency.

I do not claim a valve opened by a column of water from an elevated source for condensation; nor a pipe or tube conveying said wa-

ter, as that is already claimed and described in my invention for improvement in steam water-elevators, Letters Patent No. 101,334, dated March 29, 1870; neither do I claim a valve opened by a column of water from an elevated source of supply; nor the tube or pipe conveying said water, when the water so delivered and conveyed is used both for condensation and supply, as that has been already shown and claimed in the invention of Henry M. Wightman, for improvement in steam water-elevators, Letters Patent No. 106,525, dated August 16, 1870; but

What I do claim as my invention is—

In a water-elevating apparatus, substantially as described, the combination, with the cylinder or chamber A, of the down-condensing pipe, having the form of an inverted siphon, with a valve, K, in the shorter leg thereof, between the lower end of said leg and the point where its upper end communicates with said cylinder or chamber, substantially as and for the purposes set forth.

JOSEPH C. WIGHTMAN.

Witnesses:

C. D. MEIGS,  
A. H. HASKINS,  
FRED. CURTIS.