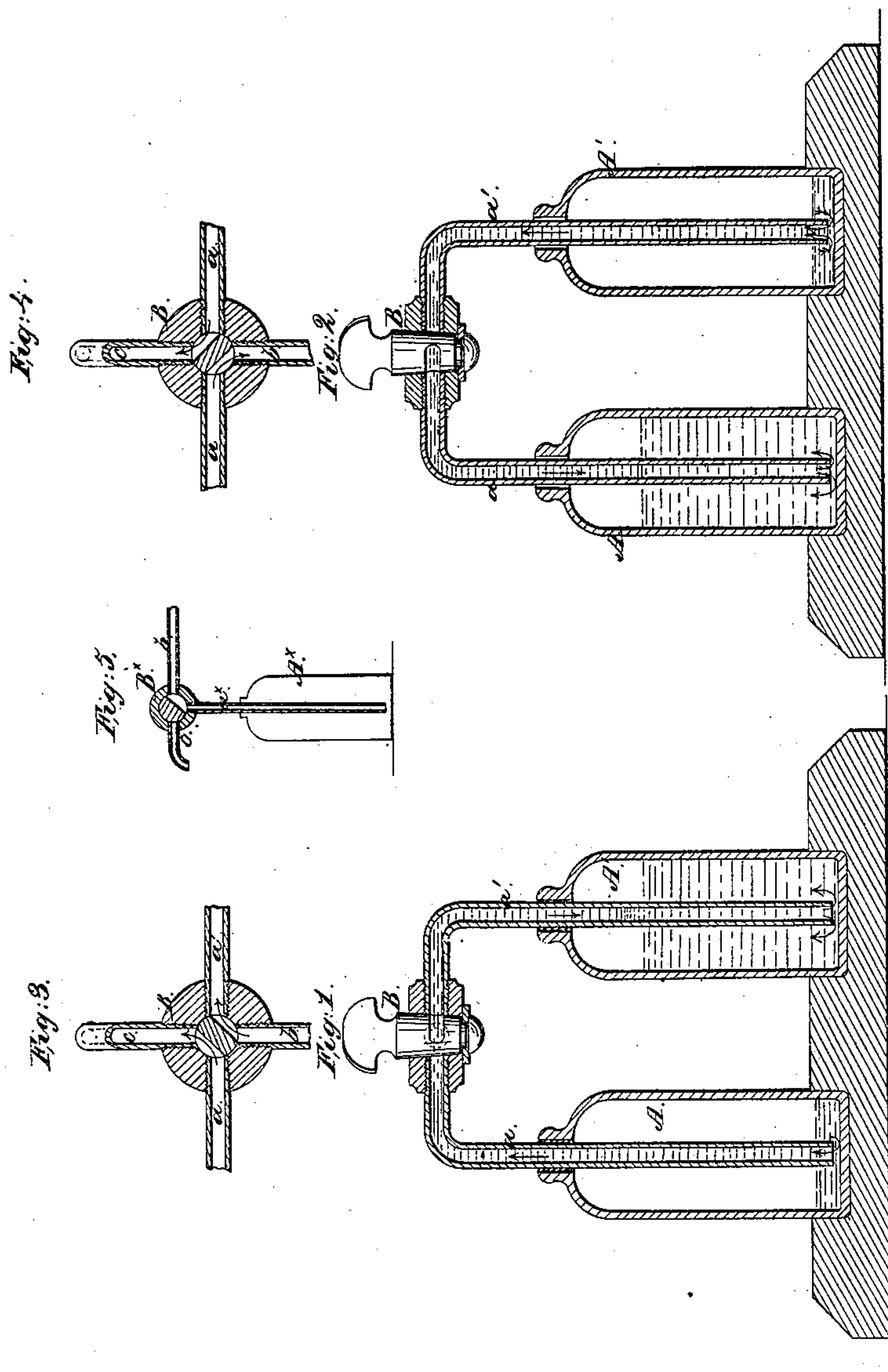


E. J. Stearns,

Water Elevator,

No. 42,969,

Patented May 31, 1864.



Witnesses:

J. W. Coomb
Roll Reed

Inventor:

E. J. Stearns
per Munn & Co
Attorneys

UNITED STATES PATENT OFFICE.

EDWARD J. STEARNS, OF CATONSVILLE, MARYLAND.

IMPROVEMENT IN WATER-ECONOMIZERS.

Specification forming part of Letters Patent No. 42,969, dated May 31, 1864.

To all whom it may concern:

Be it known that I, EDWARD J. STEARNS, of Catonsville, in the county of Baltimore and State of Maryland, have invented a new and improved apparatus, which I term a "Hydrophid," for preventing waste of water in cities and other places; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figures 1 and 2 are vertical sections of the apparatus, showing the plug of the faucet turned in different positions. Fig. 3 is a horizontal section of the faucet and connecting-pipes corresponding with Fig. 1. Fig. 4 is a similar section corresponding with Fig. 2. Fig. 5 is a vertical sectional view of a modification of my invention.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to prevent waste of water at hydrants, kitchen-sinks, wash-stands, bath-tubs, water-closets, and other hydraulic apparatus by the accidental leaving open of the cocks or faucets of such apparatus; and to this end it consists in preventing any direct communication between the service or supply pipe and the outlet, whence the water is received or drawn off for any purpose, by the interposition between said pipe and outlet of an air-vessel and a cock or faucet of such construction that it may be opened to admit water from the pipe into the lower part of the air-vessel or from the lower part of the air-vessel to the outlet, but not from the pipe to the outlet. While the pipe is open to the air-vessel the water enters the lower part of the said vessel and compresses the air in its upper part, and when the said vessel is open to the outlet, when the water is to be received or drawn, the expansion of the compressed air in the air-vessel forces out the water therefrom, but no more water can be delivered without again turning the cock than has been contained in the air-vessel. By using two of these air-vessels, in connection with the same cock or faucet, all loss of time in filling such vessel is obviated as one of the two can be filling while water is being drawn from the other.

To enable others skilled in the art to make

and use my invention, I will proceed to describe it with reference to the drawings.

A and A', Figs. 1 and 2, are two air-vessels of any suitable capacity, arranged in any convenient position, either below, above, or on the same level with the cock B, whence the water is to be supplied or drawn. This cock is what is called a "four-way cock" and two of its ways arranged opposite each other have attached pipes *a a'*, which enter the air-vessel at the top and extend nearly to the bottom thereof. A third way has connected with it the service or supply pipe *b*, and the fourth communicates with the bib or outlet *c*, whence the water issues or is drawn.

The operation of the apparatus is as follows: Before water can be drawn one of the vessels A A' requires to be partly filled by turning the plug of the cock B to bring its respective pipe *a* or *a'* into communication with the service or supply pipe *b*. As water rises in this vessel, it compresses the air in the upper part thereof, so that by turning the cock one-quarter revolution, to bring the said pipe *a* or *a'* into communication with the outlet *c*, and the other pipe *a'* or *a* into communication with the supply-pipe *b*, the water is forced out of the first-mentioned vessel through the outlet *c*, while the other vessel fills, ready to be discharged in the same manner on the cock being turned to the first-mentioned position. Figs. 1 and 3 represent water being drawn from the vessel A by the pipe *a*, and the vessel A' as being filled. By turning the cock to the position shown in Figs. 2 and 4 water is drawn from the vessel A' while A fills. By bringing the cock to a position to close both pipes *a a'* the flow of water is stopped.

In case of any omission to turn off the cock at any time after the water has been set running no more water can possibly pass the outlet *c* than was contained in the vessel A or A', which was open to the outlet *c*. The other vessel will be filled to such a height that the pressure of the air in the said vessel balances that of the supply-column.

The apparatus constructed as described is suitable for kitchen-sinks and street and yard hydrants, where several vessels full may be required in quick succession; but for water-closets, bath-tubs, and wash-stands an appa-

tus with one air-vessel, A*, such as shown in Fig. 5 will serve as good a purpose. In this apparatus the cock B*, which has three ways, is first turned to the position shown in the figure to bring the supply-pipe *b* into communication with the pipe *a** leading into the air-vessel, and when the vessel has been filled as high a possible or desirable the said cock is turned to the position to bring the pipe *a** into communication with the outlet *c*. When all the water in the vessel A*, or as much as wanted, has been drawn the cock is turned back to the first-mentioned position and the air-vessel is refilled.

By the arrangement of the pipes *a a' a**, to deliver the water at the bottom of their respective vessels A A' A*, and so causing the compression of the air in the upper parts of the said vessels, I dispense with the use of the floating-valves used in the hydrophid, which is the subject of an application recently made by me for Letters Patent and allowed by the Commissioner of Patents.

By making the pipe *a* or *a'* sufficiently flexible between the cock B and its respective

vessel A or A', to allow the said vessel to move vertically—say half an inch—and placing the said vessel on a sort of platform-balance, connected with clock-work to register the descent but not the rise of the vessel, the hydrophid may be made to perform the functions of a water-meter.

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

The interposition, between the supply or service pipe and the outlet whence the water is received or drawn off, of an air-vessel, so applied, and a cock or faucet so constructed that by turning the cock to one and another of two positions the vessel may be alternately filled and discharged by the reaction or expansion of air compressed within it while filling, and that no more water than the contents of the said vessel can be withdrawn at a time without turning the cock or faucet, substantially as herein specified.

EDWARD J. STEARNS.

Witnesses:

L. BOWNESLER,
R. O. WILLIAMS.