

No. 646,339

Patented Mar. 27, 1900.

S. H. ADAMS.

SIPHON.

(Application filed Apr. 24, 1899.)

(No Model.)

FIG. 1.

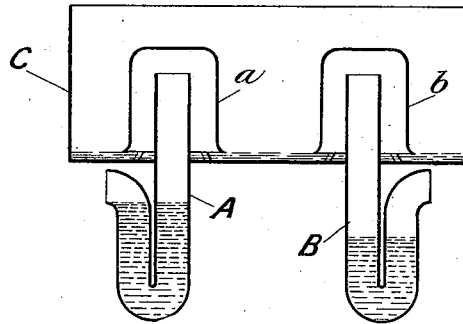


FIG. 2.

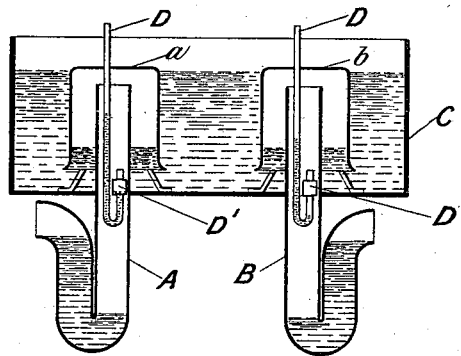
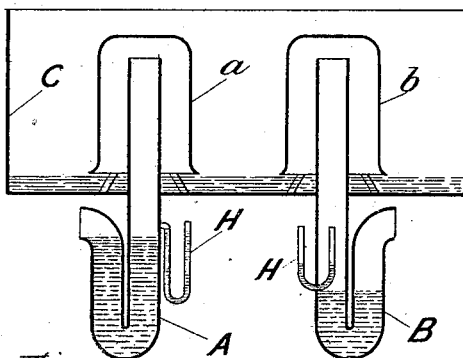


FIG. 3.

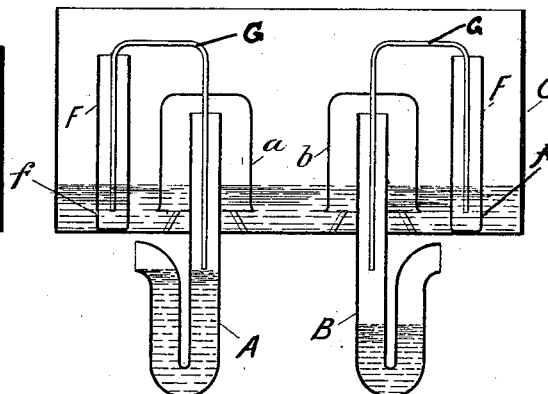


Witnesses

*W. H. Keefe*

*Oliver S. Elliott*

FIG. 4.



Inventor

*Samuel H. Adams*

By

*James L. Norris*

*Atty*

# UNITED STATES PATENT OFFICE.

SAMUEL HENRY ADAMS, OF HARROGATE, ENGLAND.

## SIPHON.

SPECIFICATION forming part of Letters Patent No. 646,339, dated March 27, 1900.

Application filed April 24, 1899. Serial No. 714,308. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL HENRY ADAMS, a subject of the Queen of Great Britain and Ireland, residing at "Cumbræ," Park avenue, Harrogate, in the county of York, England, have invented certain new and useful Improvements in Siphons, of which the following is a specification.

This invention relates to siphons, and has for its object to provide one tank or water-supply with two separate siphons, which automatically discharge alternately.

This object is accomplished in the manner and by the means hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a liquid-holding tank or vessel having my invention applied thereto; and Figs. 2, 3, and 4 are similar views showing three different modifications of my invention.

Referring to Fig. 1, A a B b are the siphons for alternately discharging the contents of a single vessel, tank, or chamber C or of connected vessels. It is assumed that a discharge has just taken place through the siphon A a and that consequently the trap of said siphon is full while that of the other siphon B b is only partially filled, since the liquid between the bottom of the trap and the top of the bend held up previous to the discharge by the pressure of air in the siphon is insufficient to fill the trap when the pressure is released and the liquid falls back and assumes the same level in both branches of the trap. Therefore when the vessel or tank C fills again and the air locked in the siphons becomes compressed and acts upon the liquid in the seals to depress the level in the vertical leg and to force the liquid toward the outgo it follows that by reason of the liquid in the leg B being initially lower than that in the leg A the air will reach the lower bend in the seal and will blow through the seal in the leg B before it can do so in the leg A—that is to say, the siphon B b will blow through before the siphon A a, and consequently the next discharge will be through the siphon B b, and after the discharge is finished the trap of that siphon will be found quite full. On the other hand, the trap of the siphon A a will only be partially filled by reason of some of the liquid seal

having been discharged through the outgo when the level in the vertical leg was depressed. It follows, therefore, that the next discharge will be through the siphon A a. Therefore the siphons discharge alternately. The first discharge takes place through that siphon which happens to have the greatest amount of air trapped in the dome or which has the weakest seal, and afterward the discharges will be alternate. This arrangement of siphons is very useful in connection with filter-beds arranged in pairs or sets which require to be filled alternately from a common source, (represented by the tank C.)

In the modification shown in Fig. 2 each siphon is furnished with a vent-pipe D, bent to provide a liquid seal and having an enlargement for a purpose hereinafter fully stated. The pipes D are open at both ends and form communications between the outer air and the interior of the siphons. Their inner ends are bent upward, as shown, and are formed with enlargements D'. The liquid collected in the bend of each of the said pipes forms a seal of sufficient depth to prevent the escape of the air locked in the siphon under the head of liquid in the tank when full; but if the discharge of the tank through one of the siphons—say A a—be started by raising the dome or otherwise the suction acting on the vent-pipe of the other siphon B b will draw a portion of the liquid out of its seal. The enlargement D' prevents the withdrawal of all the liquid, and when the discharge is complete the liquid that remains falls back into the bend of the vent-pipe and still forms a seal, but not so deep as the original seal. When, therefore, the tank refills up to its normal level, the pressure of air collected under the dome b will be sufficient to force the weakened seal in the vent-pipe of this siphon, and the air will thus be liberated and siphonic action started. By this second discharge the seal of the vent-pipe of the siphon A a will be weakened in the same way by the withdrawal of some of the liquid from said pipe, so that when next the tank refills it will discharge through the siphon A a. Thus the siphons discharge automatically and alternately. The full seal will always be preserved in the siphon that happens to be discharging.

In Fig. 3 I have shown an arrangement like Fig. 1, except that the vertical legs A B are furnished with bent vent-tubes H H, open at both ends. The liquid collected in these tubes prevents the escape of air from the interior of the siphon until the pressure is sufficient to force or blow through the seals, when siphonic action will be started. The action of the seals in these vent-tubes is precisely the same as that in the traps in Fig. 1—that is to say, a full seal will always be found in the vent-tube of the siphon last discharged, while that in the vent-tube of the other siphon will be weakened, and consequently will be ready to blow through first when the tank refills and so insure a discharge from the siphons alternately. The vent-pipes may discharge into the main traps above the water-level in said traps.

The amount of liquid discharged by the siphons is equal to that contained in the tank or chamber C plus that which enters during the discharge, and consequently the amounts delivered at different discharges will vary if the rate of supply varies. In some cases it is undesirable that the amount of liquid discharged should vary, and in such cases I insure the desired end by combining with the alternately-discharging siphons a device as follows—that is to say, I provide near each siphon a receptacle F, Fig. 4, having an opening *f* near the bottom to allow liquid to enter from the tank C, and I arrange in connection with each siphon a pipe G, having one end dipping into the vertical leg of the siphon to about the level of the outgo and the other end dipping into the vessel F. During the discharge through one of the siphons the corresponding pipe G acts siphonically to draw liquid from the receptacle F faster than the liquid can enter through the opening *f*, so that ultimately the end of the pipe is exposed and air is thus admitted to the interior of the siphon, whereupon siphonic action is broken

and the discharge ceases. The amount of liquid delivered by the discharge is thus seen to be independent of the rate at which liquid may have been entering the tank during the discharge.

What I claim is—

1. The combination with a liquid-supply, of two separate and independent siphons, and deep traps in the outgo-legs, whereby when a discharge takes place through one siphon its deep trap is filled with liquid while that of the other siphon which has not discharged remains weakened and therefore will discharge first on the next occasion, so that an automatic alternate discharge is obtained, substantially as described.

2. The combination with a source of liquid, of two siphons arranged therein, and bent vent-pipes communicating with the interiors of the siphons and forming liquid seals, the whole arranged substantially as described, and for the purpose specified.

3. The combination, with a siphon having a trap in the outgo-leg, of a vent-pipe forming a communication between the interior of the siphon and the outer atmosphere, a bend at the inner end of said siphon, and an enlargement in said bend, substantially as described.

4. In combination with a liquid-supply, a pair of siphons each having a vent-pipe passing from the interior of the siphon to the exterior atmosphere, and constructed with a bend at the inner end, and an enlargement in said bend, substantially as described, and for the purpose specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

SAMUEL HENRY ADAMS.

Witnesses:

CHARLES DOWNEY,  
GEORGE WILLIAM CURRY.