H. C. ALGER.

LIQUID SIPHON.

APPLICATION FILED AUG. 4, 1913.

1,127,387. Patented Feb. 9, 1915.

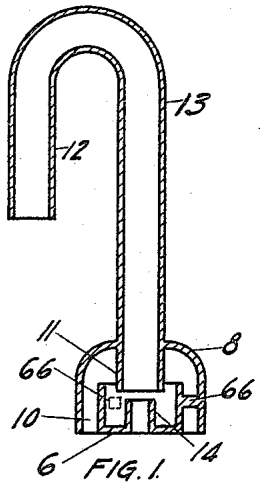

FIG. 1.

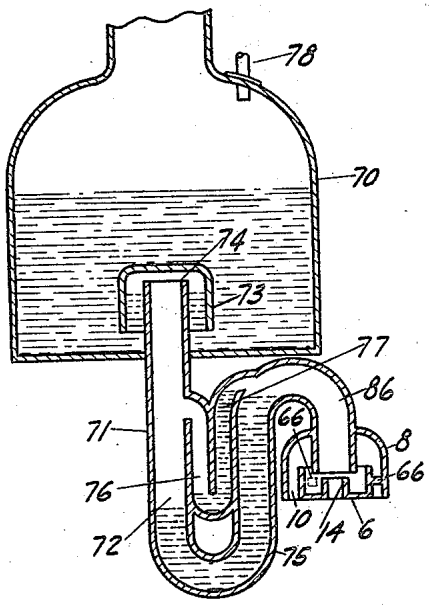

FIG. 2.

WITNESSES

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LIQUID-SIPHON.

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To all whom it may concern:

Be it known that I, HARLEY C. ALGER, a citizen of the United States, residing at Chicago Heights, county of Cook, and State of Illinois, have invented new and useful Improvements in Liquid-Siphons, of which the following is a specification.

My invention relates to improvements in liquid siphons which may be adapted for siphoning liquid for various purposes. Such a siphon is useful in connection with automatic flush tanks and liquid meters in which measuring or weighing compartments are automatically filled and emptied.

One object of my invention is to construct a siphon which operates efficiently.

Another object is to provide a siphon which is more easily set in operation than has heretofore been possible.

These objects are attained by forming a temporary liquid seal at some point throughout the length of a siphon pipe. The position of the temporary liquid seal may vary but it is usually preferable to make the temporary liquid seal at or near the discharge end of the siphon pipe.

Referring to the accompanying drawing, Figure 1 shows an elevation, partly in section, of a siphon embodying my invention, while Fig. 2 shows one form of my invention as may be applied to an automatic flush tank.

Other modifications or uses of my invention may occur to those skilled in the art and I do not wish to confine myself to the exact constructions set forth.

Referring to the accompanying drawing, Fig. 1 represents a siphon made in accordance with my invention, having a bend as shown at 13, an intake leg 12 extending to a point lower than the bend and a longer discharge leg 4 extending to a point lower than the bend and usually lower than the end of the leg. 12.

The purpose of the liquid seal is to liquid seal the discharge leg of the siphon particularly at the instant that the siphon starts to operate, in order to make the siphon catch in a solid stream. This may be accomplished as shown in Fig. 1 by surrounding the discharge end 11 of the siphon with liquid, thus preventing the admission of air to the discharge leg 4 of the siphon which condition may tend to cause the siphon to break, thus interfering with the proper operation of the siphon.

A cup 6 is placed at the discharge end 11 of the siphon pipe so as to liquid seal the end of the pipe when the cup is full of liquid; a tube 14 having an area less than the area of the siphon extends from the bottom of the cup 6 to a level below the top edge of the cup and preferably below the end of the discharge pipe. Liquid will be retained at all times within the cup to the top level of the tube 14 even when no liquid is passing to the cup. The tube 14 forms a vent to the interior of the pipe when liquid is not flowing and drains the cup to the upper edge of the tube 14 when liquid is not passing through the siphon pipe in sufficient volume to maintain the cup full of liquid thus doing away with the liquid seal when no liquid is passing through the siphon at the time when the liquid seal is not wanted.

A suitable shield 8 may be provided surrounding the cup 6 and the discharge end 11 to re-direct the liquid downward through the annular space 10 to prevent liquid from splashing upward although the use of such a shield is optional. The cup 6 is held in place by lugs 66 bolted to the shield 8 or any other desired method of supporting the cup in place may be employed.

As liquid starts through the siphon pipe in sufficient quantity it fills the cup 6 so that water passes downwardly through the tube 14 and also spills over the upper edge of the cup 6, which forms a temporary liquid seal preventing air from being admitted to the discharge leg 4 of the siphon pipe and any air which may have been retained in the siphon pipe and which might prevent the siphon from catching in a solid stream is gradually carried out with the liquid passing through the pipe. As no more air can gain admittance due to the liquid seal, the pipe soon becomes full of liquid and liquid runs in a solid stream. In this manner less liquid is needed to flush and start a siphon than if the discharge leg is not temporarily liquid sealed and the operation of the siphon is made more efficient and certain. When the siphon is not operating it may be desirable that its interior shall be in communication with the atmosphere so that the liquid will rise freely as it approaches the bend in the siphon and to have the discharge leg of the siphon liquid sealed only at the time that the siphon is operating or about to start operating. This is accomplished by the above described structure since the liquid

seal is broken when the siphon ceases to operate and the liquid drains from the cup to the upper edge of the tube 14.

Fig. 2 shows another particular use of my invention in connection with automatic flush tanks. Such a device consists of a tank or basin 70 having a discharge pipe 71 adapted to drain liquid from the tank 70 quickly for the purpose of flushing sewer pipes and the like. The discharge pipe may consist of a liquid U-trap having a leg 72 communicating with the interior of the tank 70. An inverted bell 73 open at its lower end is secured above the upper end 74 of the discharge pipe. The other leg 75 of the U-trap is adapted to discharge liquid below the tank 70 and communicates with a pipe 86 forming a discharge nozzle. The cup 6 is used to form a temporary liquid seal as shown, the action of the same being as previously described. A second U-tube having one leg 76 communicating with the leg 72 and its other leg 77 opening above the upper extremity of the leg 75 is made of smaller diameter while its legs are also smade shorter than the legs of the other U-tube.

In the operation of this device it will be seen that the water entering through an inlet pipe 78 falls to the bottom of the tank 70 and rising in the tank 70 water seals a certain amount of air underneath the bell 73. The device having been in operation, the two U-traps will be water sealed so that this volume of air is inclosed within the bell 73 and the two legs, 72 and 76. As the water level rises in the tank 70, the air within the bell 73 is compressed which will gradually force the water in the legs 72 and 76, downward. When the water level in the leg 76 reaches the level shown in Fig. 2 any further accumulation of water within the tank 70 forces some of the air inclosed by the bell 73 and the legs 72 and 76 through the leg 77 of the small U-trap, blowing the water therefrom and allowing most of the air to escape from the bell 73 and the leg 72. A portion of the air having escaped, water rises within the bell 73 and spills over the end 74 of the discharge pipe and passes through the nozzle 86. When only a relatively small portion of the water passes through the nozzle 86, the cup 6 forms a temporary water seal which assists in starting the discharge pipe and causes it to operate more effectively.

Other uses of this improved siphon will occur to those skilled in the art and I do not confine myself to the use of the siphon for the particular purposes set forth.

What I claim as my invention and desire to protect by Letters Patent is:—

1. In a siphon for liquid, a cup adapted to liquid seal the siphon while the siphon is operating and a vertical tube extending through said cup for destroying the liquid seal when the siphon ceases to operate.

2. In a siphon having a discharge leg, a cup positioned at the discharge end of said discharge leg for the purpose of liquid sealing the discharge leg of the siphon while the siphon is operating and a vertical tube extending through the cup for the purpose of destroying the liquid seal when the siphon ceases to operate.

3. In a siphon having a discharge leg, a cup adapted to liquid seal the discharge end of such leg while the siphon is operating and a tube extending vertically upward from the bottom of the cup for the purpose of destroying the liquid seal when the siphon ceases to operate.

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Witnesses:
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