

J. H. MAHONEY.
FLUSH VALVE.
APPLICATION FILED MAY 29, 1909.

963,231.

Patented July 5, 1910.

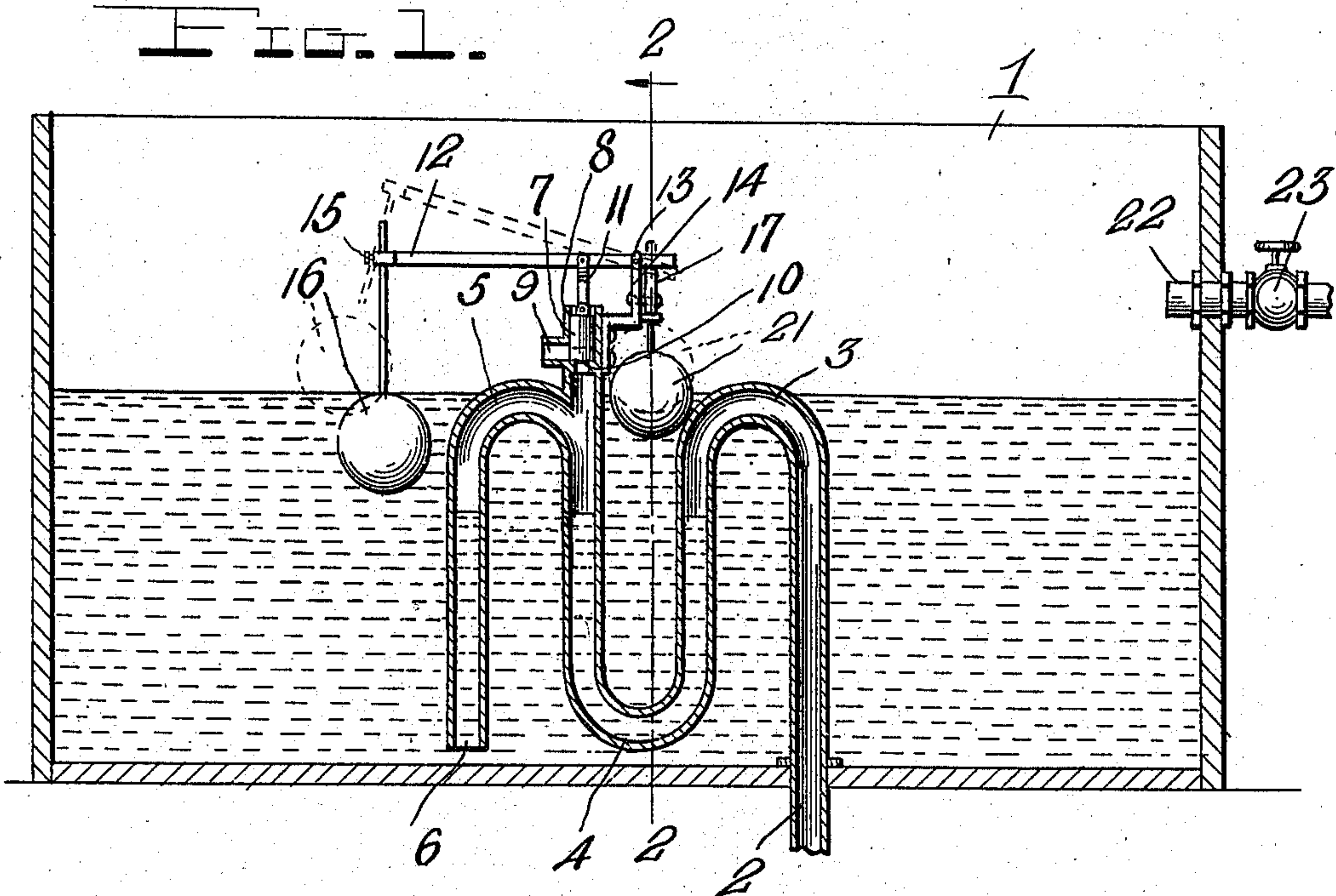
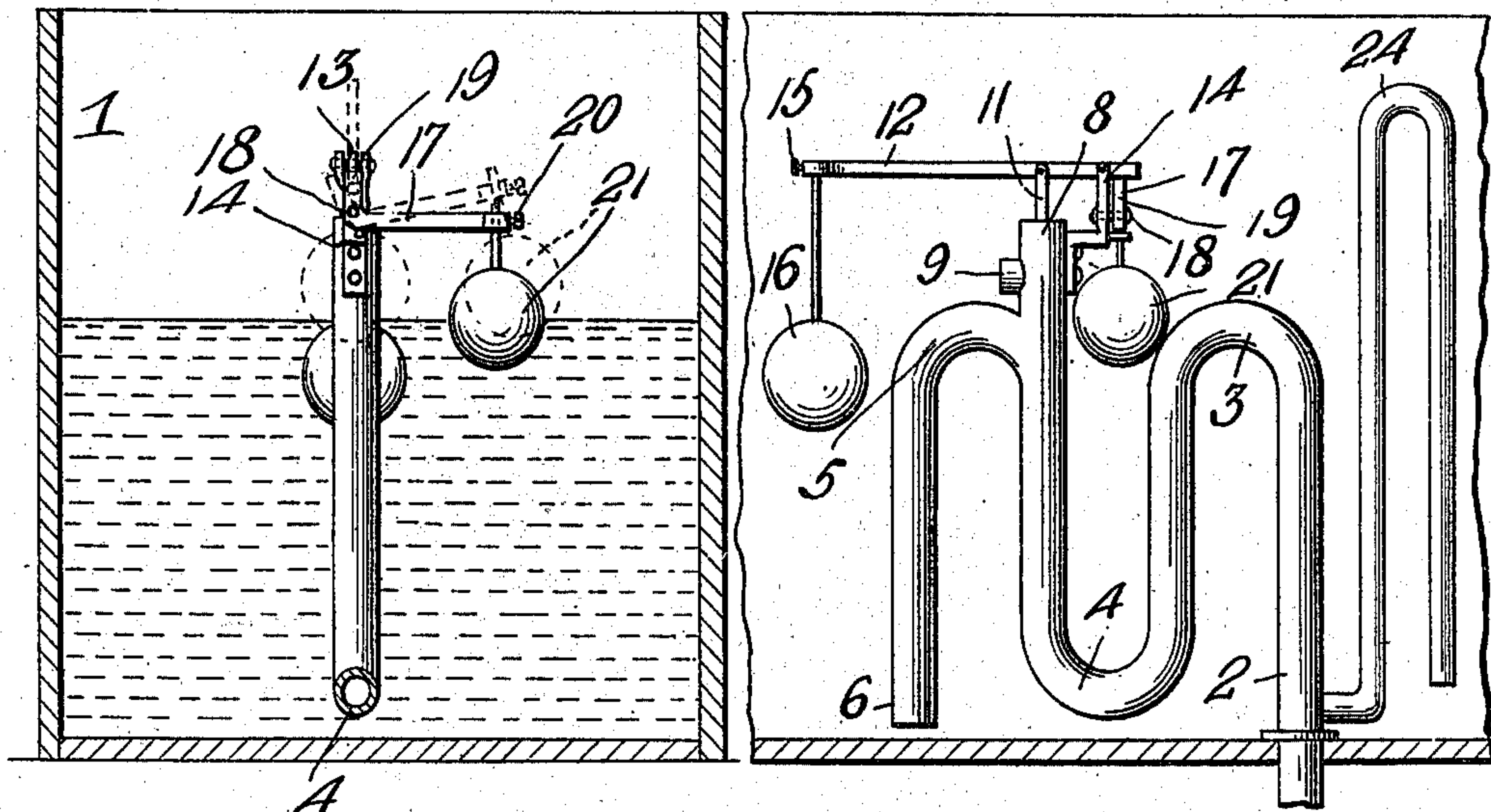


Fig. 2.

Fig. 3.



WITNESSES
Chas. L. Griestbauer.
E. M. Rickette

INVENTOR
James H. Mahoney
By Walton E. Coleman
Attorney

UNITED STATES PATENT OFFICE.

JAMES H. MAHONEY, OF WORCESTER, MASSACHUSETTS.

FLUSH-VALVE.

963,231.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed May 29, 1909. Serial No. 499,111.

To all whom it may concern:

Be it known that I, JAMES H. MAHONEY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Flush-Valves, of which the following is a specification, reference being had to the accompanying drawings.

This invention is a siphon flush valve for use in water closet tanks, either high or low, cisterns, sewerage tanks and other tanks, vaults, cisterns or the like that are emptied by being siphoned either automatically or by the use of manually operated means.

One of the principal objects of my invention is to provide a valve of this character which will siphon without a pipe extending from its outlet to act as the long leg of the siphon, thereby permitting of its use on a low tank.

With the above and other objects in view, as will hereinafter appear, the invention consists of the combinations and arrangements of parts and novel features of construction hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view through my improved siphon flush valve and a tank in which it is arranged; Fig. 2 is a vertical section taken on the plane indicated by the line 2—2 in Fig. 1; and Fig. 3 is a detail view showing a slightly modified form of the invention.

In the drawings 1 denotes a tank, cistern or other container for water or other liquid and 2 denotes an outlet or discharge pipe having that portion within the tank provided with three return bends 3, 4, 5, the latter bend 5 being at the top of the open or inlet end of the pipe which is disposed close to the bottom of the tank, as indicated at 6 in Fig. 1. The intermediate lower bend 4 and its upstanding arms are adapted to always contain water while the bend 5 is adapted to contain air which when the tank has been filled to the predetermined point is released either manually or automatically to cause the water in the bend 4 to start a siphoning action through the pipe 2. To control the bend 5 a valve 7 is provided and in the embodiment illustrated is in the form of a plunger arranged in an air escape pipe 8 rising from the bend 5 and having a laterally projecting outlet 9 which is closed

by the plunger valve 7, a seat 10 being also provided in the pipe or casing 8 for the valve. The upper end of the valve 7 is connected by a link 11 to an operating lever 12 which is fulcrumed intermediate its ends at 13 on a bracket 14 arranged on the pipe 8. The long arm of the lever 12 has adjustably connected to it by means of a set screw 15 or other suitable means the stem of a submerged float 16. This float is adapted to open the valve to permit of the escape of the confined air in the bend 5 and in order to permit the float to open the valve quickly and thereby render the device more reliable in its operation, I provide means for holding the valve against movement until the water reaches a predetermined level in the tank. This means preferably consists of a bell crank lever 17 pivoted at its angle at 18 to the bracket 14 and adapted to have its short end swing under the short end 19 of the lever 12 to hold the latter in its horizontal position shown in Fig. 1 and hence to maintain the valve in its lowered or closed position. The other arm of the angular lever or bell crank 17 has adjustably connected to it by a set screw 20 or other means the stem of a float 21. This float is out of water when the water in the tank is low and it is elevated to retract the bell crank 7 from beneath the end 19 of the lever 12 when the water reaches a predetermined level in the tank.

The tank may have a water inlet of any form and construction. In Fig. 1, 22 denotes an inlet pipe containing a controlling valve 23. By means of this valve the tank may be made to fill as slowly or as rapidly as desired.

In operation, assuming the parts to be in their full line position shown in Fig. 1, when the level of the water rises to a predetermined point the float 21 will be elevated to its dotted line position shown in Figs. 1 and 2 and the short vertical arm of the bell crank 17 will be moved from beneath the end 19 of the lever 12. When this is done, the float 16, which has been held submerged, will rise quickly to its dotted line position and thereby elevate the valve 7 so that the confined air in the bend 5 will be permitted to escape through the air outlet 9. The water rushing in said bend causes the valve to siphon. As the water lowers the float 16 lowers and the valve 7 closes the air inlet so that the siphoning will continue until it

is broken by air entering the lower end 6 of the pipe. When this occurs the device becomes air bound so that no more water can pass out of the pipe 2 until the confined air in the bend 5 is released as above explained. It will be noted that the float 21 serves as a check or controlling means for the valve actuating float 16 so that the latter will not open the valve until the water in the tank reaches a predetermined level. This level is determined by the adjustment of the valve 21.

While I have shown and described the invention as being entirely automatic in operation, it will be understood that a manually operated device may be employed for actuating the bell crank 7 or for releasing the air outlet valve. When the automatic arrangement is used the intervals between the periods of operations or siphonings can be regulated by varying the supply of water to the tank so that the latter will be emptied as soon as the water raises the float 21.

It will be noted that the device is of simple construction, that it can be made of any metal and that no special packings, gaskets or washers are required.

In Fig. 3 of the drawings, 24 indicates an overflow pipe which may, if desired, be used in connection with the parts above described. This pipe secures safety in case of accident to the valve.

This automatic arrangement can be used on other siphon or slow closing valves by using the float 16 to raise the plunger of the valve and the float 21 to act as a check on

the float 16, as in drawing. In using this arrangement on other valves it will not be necessary to use the small air valve that is used on the above valve.

Having thus described the invention what is claimed is:

In a device of the character described, the combination of a liquid container, a discharge pipe having upper and lower return bends, the upper bend being formed with an upstanding air escape pipe, the latter being cylindrical and containing a valve seat and a laterally projecting outlet above said valve seat, a plunger valve slidable in the upper portion of said air escape pipe and adapted to co-act with said seat and said outlet, a bracket upon said air escape pipe, a lever fulcrumed adjacent one of its ends on said bracket, a link connecting the intermediate portion of the long arm of said lever to said valve, a float carried by the long arm of said lever, a right angular lever fulcrumed at its angle on said bracket and having a short arm projecting upwardly and adapted to swing under the short arm of the first mentioned lever, a float connected to the long arm of the right angular lever, and a stop upon said bracket to limit the swinging movement of said right angular lever.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JAMES H. MAHONEY.

Witnesses:

GERALD W. CONDON,
REGIS J. CLOUTIER.