May 14, 1957 B. A. DOWNS 2,792,013

SIPHON DEVICE HAVING ADJUSTABLE PRIMER WELLS

Filed Dec. 10, 1954

FIG-1

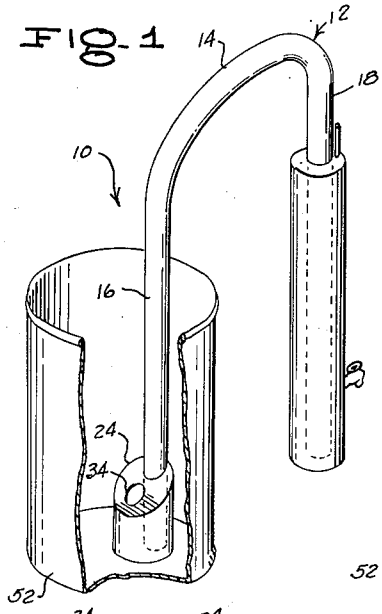
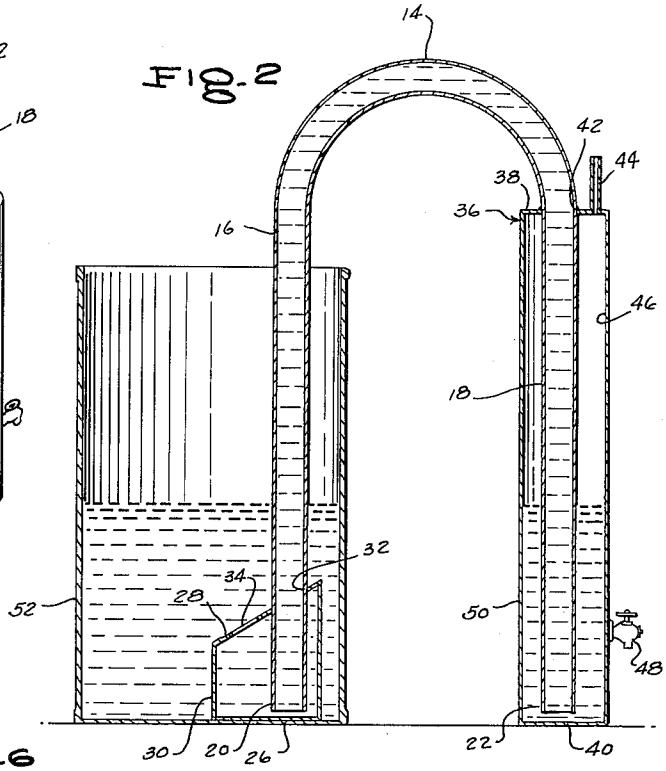



FIG-2



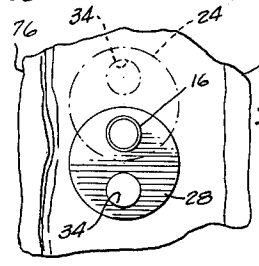




FIG-6

FIG-4

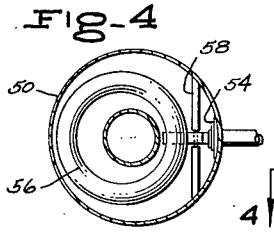



FIG-3

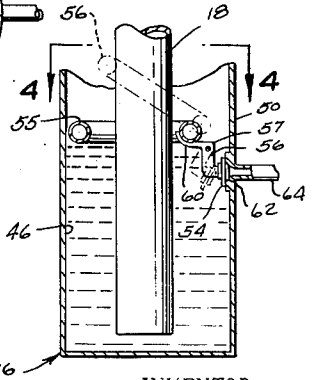
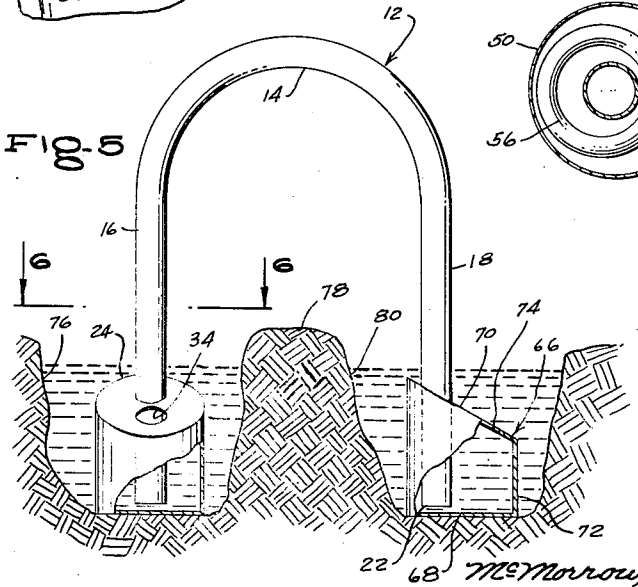



FIG-5




INVENTOR.

BERT A. DOWNS

BY

McMorrow, Berman & Davidson

ATTORNEYS

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# SIPHON DEVICE HAVING ADJUSTABLE PRIMER WELLS

Bert A. Downs, Hammon, Okla.

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4 Claims. (Cl. 137—131)

This invention relates to siphons, and more particularly to siphons with flow starting and maintaining means.

It is an object of this invention to provide a siphon device which may be readily primed and when placed in use will automatically re-establish flow if the liquid in the inflow end of the device recedes below the intake point and then subsequently raises above such point, and which will hold its prime under a variety of conditions including being transported from one location to another.

Another object of this invention is to provide a siphon device which may be employed in a variety of places and for a variety of uses, wherever it is desirable to have a flow of water or other liquid from one source of liquid at a given level to another source of liquid at the given or another level in order to maintain a flow of liquid between the sources of liquid to thereby keep a given level of liquid in one of the sources. Thus, the necessity for constant supervision of opening and closing valves will be obviated, saving a great deal of time and labor.

Still another object of this invention is to provide a siphon device which may be primed by having it lying on its side to thereby facilitate this operation and which is automatic in operation once the priming has been accomplished.

Yet another object of this invention is to provide a siphon device which can be easily and cheaply produced.

Other objects and advantages will become apparent from a consideration of the following detailed description, forming the specification, and taken in conjunction with the accompanying drawings, in which:

Figure 1 is a perspective view, partially broken away, of a siphon device embodying this invention;

Figure 2 is an enlarged medial vertical cross sectional view of the device of Figure 1;

Figure 3 is a fragmentary, sectional view of the lower right-hand portion of the device of Figure 2, showing a modified form thereof;

Figure 4 is a transverse, cross sectional view taken substantially along line 4—4 of Figure 3 and looking in the direction of the arrows;

Figure 5 is a side elevational view of another form of the invention, partially broken away, and shown in an operative position; and

Figure 6 is an enlarged transverse, cross sectional view taken substantially along line 6—6 of Figure 5 and looking in the direction of the arrows.

With continued reference to the drawings, and particularly to Figures 1 and 2, there is shown a siphon device, generally indicated at 10 which comprises a siphon pipe 12 having an arcuate central section 14 with laterally extending parallel legs 16 and 18 on opposite sides thereof lying in a common plane therewith and opening to the atmosphere at a common level at their free ends 20 and 22 respectively.

The leg 16 carries thereon, adjacent its free end 20, a closed primer well 24 in the form of a truncated cylinder having a flat bottom wall 26, an inclined top wall



28 and a circular side wall 30 extending therebetween with the top wall inclined at about a 30° angle to the bottom wall.

The free end 20 of the leg 16 is disposed within the well 24 and adjacent the bottom wall 26 thereof. The well 24 is provided in its top wall 28 with a pair of spaced openings 32 and 34 transversely therethrough with the leg 16 being received through the opening 32 so that the well or container 24 is rotatably secured thereon while the opening 34 defines an inlet through which liquid may enter the well 24.

A pipe, generally indicated at 36, having top and bottom end walls 38 and 40 closing opposite ends thereof is carried by the leg 18 adjacent its juncture with the arcuate center section 14 with the leg 18 extending through an opening 42 in the top wall 38 so that the pipe is in surrounding relation to the leg 18. The top wall 38 may be secured to the outer surface of the leg 18 of the siphon pipe 12 as by being welded or brazed thereto.

It will be noted that the free end 22 of the leg 18 terminates adjacent the bottom wall 40 and is at a common level or in the same plane as the free end 20 of the leg 16.

An upstanding vent pipe 44 is carried by the top wall 38 and communicates with the liquid containing chamber 46 of the pipe 36.

A manually operated valve 48 is carried by the side wall 50 of the pipe 36 intermediate the ends thereof but more closely adjacent the bottom wall 40 to provide a liquid outlet for the siphon device.

In use, the device may be primed by placing in a liquid, such as water for instance, with the device lying on its side so that the liquid may flow in through the opening 34 and thence through the siphon pipe 12 and into the liquid containing pipe 36. Or, a source of vacuum may be attached to the vent pipe or tube 44 so as to draw liquid in which the well 24 is immersed through the siphon pipe 12 and thence to the liquid containing pipe 36. Once the device is primed, it may be used in any desired location and may be moved from one location to another without losing its prime. It may be employed for maintaining water at a given level in hog troughs or may be used to maintain a flow of water into a chicken watering trough, or as shown in Figures 1 and 2, it may be employed to siphon water from a container 52 through the open top thereof and have the water or liquid discharged through the valve 48 when the valve is opened whereby the level of the water in the container or tank 52 will be reduced to the point where the center lines of the inlet opening 34 and the valve 48, which lie in a common plane, is level with the height of the liquid in the tank 52.

Also, the device 10, once primed, may be laid on its side without losing its prime since the liquid will be maintained in the siphon pipe as the water level in the well 30 and pipe 50 will not fall below the open free ends 20 and 22 of the siphon pipe.

In Figures 3 and 4, there is shown means whereby the flow of liquid through a discharge valve 54 carried by the side wall 50 of the liquid containing pipe 36, which valve is responsive to the operation of a float 55, in the form of a ring encircling the leg 18 of the siphon pipe.

The valve 54 is carried at one end of one arm 56 of a bell crank 57 pivoted intermediate its ends upon a rod 58 secured at its opposite ends to the inner surface of the side wall 50 and extending as a secant thereacross. The other arm 60 of the bell crank 57 is arcuately formed at its outer end to encirclingly embrace the ring float 55 and secured thereto.

Thus, as the level of the liquid within the pipe 36 rises,

the ring float 55 will move from the solid to the broken line position shown in Figure 3 and cause the valve 54 to move away from its seat provided by the flared end 62 of an outlet pipe 64 passing transversely through the side wall 50 with the flared end 62 disposed within the chamber 46. Thus, liquid will flow out through the outlet pipe 64 and will continue to so flow until such time as the level of the liquid in the pipe 36 will be reduced to the point where the ring float 55 again assumes its position shown in full lines in Figure 3, whereupon the valve 54 movable with the bell crank 57 will again seat upon the flared end 62 of the outlet pipe 64 to stop the flow of liquid through the outlet pipe 64. It is to be noted that the purpose of the float valve 54 is to assure that the device will stay primed after being set in place and primed, the valve acting to maintain the level of the liquid in the pipe 36 above the outlet pipe 64.

In the form of the invention shown in Figures 5 and 6, the liquid containing pipe 36 employed in the form of the invention of Figures 1–4 has been replaced by a well, generally indicated at 66, identical with the well 24 so that the well 66 is rotatably carried on the leg 18, with the free end 22 of the leg is disposed within the well and terminates adjacent the bottom wall 68 thereof.

As in the case of the well 24, the well 66 has an inclined top wall 70 with a cylindrical side wall 72 extending between the top and bottom walls. The top wall 70 is provided with an opening 74 transversely therethrough, similar to the opening 34 in the well 24, while the leg 18 passes through a suitably formed opening, similar to the opening 32, in the top wall 70 whereby the well may be rotatably carried thereon for rotation about the leg as an axis.

It will be apparent that the siphon device, shown in Figure 5, may be readily primed by immersing the device in a liquid while it is on its side so as to permit liquid to flow through the openings 34 and 74 and fill the siphon pipe 12. Once the siphon device is primed, it may be placed in use at a given location, and may be transported from place to place without losing its prime. Also, even though the device may be knocked down or laid upon its side, the prime will remain in the siphon pipe 12.

As shown in Figure 5, the device has one well 24 placed in an irrigation ditch 76, or other source of liquid, while the pipe 12 extends upwardly therefrom and across a bank or dividing wall 78 so that the other well 66 may be placed in an adjoining irrigation ditch 80 so that liquid or water may be transferred from the ditch 76 to the ditch 80 through the operation of the siphon device. This action is automatic and will continue to maintain the levels of the adjoining ditches at a level. When the liquid or water in the irrigation ditch 76 falls below the inlet opening 34, the flow of liquid between the ditches will cease, however, when the level of liquid in the ditch 76 again rises above the inlet opening 34, the siphon device will again become operative to transfer liquid from the irrigation ditch 76 to the adjoining ditch 80.

The rate of flow of the water through the device may be controlled by turning the well 24 about the leg 16 as an axis, since it is rotatably mounted thereon to be directed upstream, as shown in broken lines in Figure 6, whereupon the flow of liquid will be increased, and conversely, the flow can be decreased by moving the well 24 so that the inlet opening 34 is pointed down stream or with the current. It will be noted that the rate of flow of water can be controlled at any point between the solid and broken line position of the well 24 shown in Figure 6.

From the foregoing, it will be apparent that there has been provided a siphon device which contemplates in its construction, a siphon pipe having a central arcuately formed section having laterally extending parallel legs on opposite sides thereof lying in a common plane and opening to the atmosphere at a common level, a closed primer well having an inclined top wall rotatably carried by one of the legs with the free end of the leg disposed within and adjacent the bottom of the well with the top wall of the well being an inclined surface with respect to the bottom wall of the well and having an opening transversely therethrough.

Due to the approximate 30° angle at which the top walls of the wells 24 and 74 are placed, it will be seen that by rotating the containers so that their openings 34 and 74 will lie in a common plane with the legs 16 and 18 of the siphon pipe to facilitate priming thereof by lying the device on its side.

Also, the device may be employed in any location where an automatic siphon is to be used.

While there is shown and described the preferred embodiment of the invention, it is to be understood that the structure is susceptible to change and modification within the practicability of the invention and therefore should be limited only by the scope of the claims appended hereto.

What is claimed is:

1. A siphon device comprising a siphon pipe having a central section and laterally extending parallel legs on opposite sides of the central section lying in a common plane and opening to the atmosphere at a common level, a closed primer well having a bottom wall and a top wall inclined with respect thereto rotatably carried by one of said legs with the free end of the leg disposed within and adjacent the bottom of said well, said top wall having an opening transversely therethrough to define a liquid passage.

2. A siphon device comprising a siphon pipe having a central section and lateraly extending parallel legs on opposite sides of the central section lying in a common plane and opening to the atmosphere at a common level, a closed primer well having a bottom wall and a top wall inclined with respect thereto rotatably carried by one of said legs with the free end of the leg disposed within and adjacent the bottom of said well, said top wall having an opening transversely therethrough to define a liquid passage, a liquid containing pipe having top and bottom end walls carried by the other leg in surrounding relation thereto with the free end of said other leg terminating adjacent the bottom wall, a vent tube upstandingly carried by said top wall and in communication with the interior of said pipe, and valve means carried by said pipe intermediate its ends to define a discharge means for said device.

3. A siphon device comprising a siphon pipe having a central section and laterally extending parallel legs on opposite sides of the central section lying in a common plane and opening to the atmosphere at a common level, a closed primer well having a bottom wall and a top wall inclined with respect thereto rotatably carried by one of said legs with the free end of the leg disposed within and adjacent the bottom of said well, said top wall having an opening transversely therethrough to define a liquid passage, a liquid containing pipe having top and bottom end walls carried by the other leg in surrounding relation thereto with the free end of said other leg terminating adjacent the bottom wall, a vent tube upstandingly carried by said top wall and in communication with the interior of said pipe, and valve means carried by said pipe intermediate its ends to define a discharge means for said device, a ring float disposed within said liquid containing pipe in encircling relation to said other leg and operatively connected to said valve means, said float responsive to the rise and fall of liquid in said liquid containing pipe to open and close said valve means.

4. A siphon device comprising a siphon pipe having a central section and laterally extending parallel legs on opposite sides of the central section lying in a com-

mon plane and opening to the atmosphere at a common level, a closed primer well having a bottom wall and a top wall inclined with respect thereto rotatably carried by one of said legs with the free end of the leg disposed within and adjacent the bottom of said well, said top wall having an opening transversely therethrough to define a liquid passage, a second closed primer well having a bottom wall and a top wall inclined with respect thereto rotatably carried by the other of said legs with



the free end of said other leg disposed within and adjacent the bottom of said second well, said top wall of said second well having an opening transversely therethrough to define a liquid passage.

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