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E. CROUSE

LIQUID DISPENSING APPARATUS

Filed Jan. 2, 1926

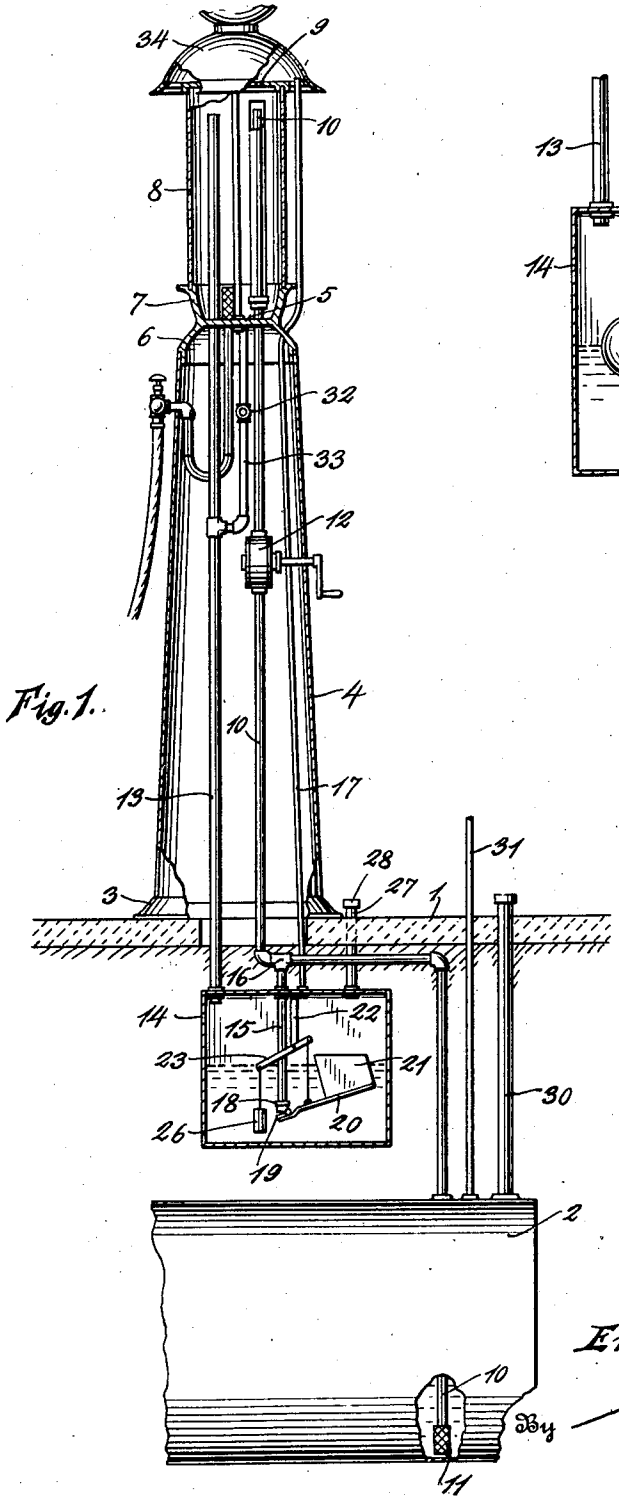


Fig. 1.

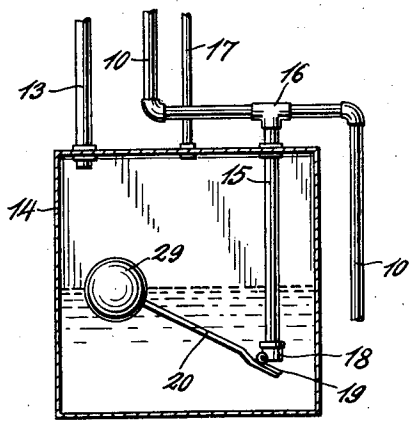


Fig. 3.

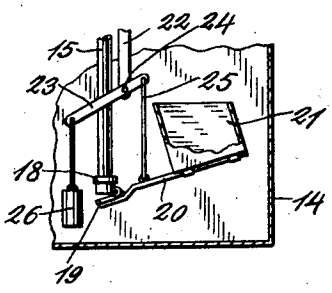


Fig. 2.

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LIQUID-DISPENSING APPARATUS.

Application filed January 2, 1926. Serial No. 78,813.

This invention relates to improvements in apparatus for dispensing liquids and has reference more particularly to improvements in apparatus for dispensing gasoline.

In my Patent 1,595,503 August 10, 1926, I have described and claimed a gasoline dispensing apparatus in which the contents of the measuring bowl may be drained into a small underground container of sufficient capacity to hold the entire contents of the measuring bowl.

This invention is in the nature of an improvement of the device described and claimed in the application above identified and will now be described in detail, reference for this purpose being had to the accompanying drawing in which the apparatus has been illustrated and in which:

Fig. 1 is a vertical section through my improved dispensing apparatus;

Fig. 2 is a section through a portion of the underground reservoir showing the float operated valve to a somewhat enlarged scale; and

Fig. 3 is a sectional view showing a slightly modified form of float valve.

Numeral 1 represents the surface of the ground or the upper surface of the cement slab upon which the dispensing apparatus rests and 2 represents an underground storage tank. That part of the dispensing apparatus that is located above the ground consists of a base 3 upon which the lower end of the enclosing casing 4 rests. Supported by the upper end of the casing 4 is a cast iron member having a bottom part 5 from which the annular flange 6 projects downwardly and from which the flange 7 extends upwardly, in the manner shown. A graduated cylindrical measuring bowl 8 has its lower end resting on the flange 7 and its upper end closed by a cover member 9. A suction or fill pipe 10 extends from the bottom of the storage tank 2, where it terminates in a foot valve 11, to a point near the upper end of the bowl 8. At some convenient point intermediate the tank 2 and the measuring bowl, a hand pump 12 is connected in the pipe 10 so that by operating this pump liquid may be transferred from the storage tank to the measuring bowl. An overflow pipe 13 extends through the bottom 5 and into the bowl 8 where it terminates a short distance below the upper end of the pipe 10. The lower end of the overflow pipe opens into an auxiliary drain tank 14 whose capacity should be sufficient to receive the maximum contents of the measuring bowl. A pipe 15 has its upper end connected with the suction pipe 10 by means of a T 16 and has its lower end terminating a short distance above the bottom of the tank 14. A vent pipe 17 connects the interior of the tank 14 with the atmosphere and preferably extends into the protecting metal cap 34 of the measuring bowl, the interior of the cap being in free communication with the atmosphere. Secured to the lower end of the pipe 15 is a valve having a part 18 secured to the pipe. Hingedly connected to the part 18 is a valve member 19 which can be moved into a position in which it seats against the open end of the part 18 and into a position like that shown in Figs. 1 and 2 in which communication is established between the interior of the pipe 15 and the tank 14. An arm 20 has one end secured to the hinged valve member 19 and carries near its outer end a bucket 21 that is open at the top, in the manner shown in Fig. 2. A bracket 22 is connected at its upper end to the top of the tank 14 and supports a lever 23 that is pivotally connected with it at the point marked 24. A tension member 25 connects one end of the lever 23 with the arm 20 and a weight 26 is connected to the other end thereof. The weight 26 is so proportioned that it will hold the parts in the position shown in Fig. 2 when the bucket 21 is empty. When the bucket 21 is filled with gasoline, its weight will be sufficient to overbalance the force produced by the weight 26 and to move the valve member 19 to closed position. The density of the weight 26 is preferably as high as practicable so that it will displace as little liquid as possible and must be so proportioned that the valve will not open until the liquid level is above the valve. A pipe 27 whose upper end is closed by a cap 28 extends from the tank 14 to a point above the surface 1 and is so located that it can be used for introducing liquid into the bucket 21 after the device has been installed and whenever necessary.

In Figure 3 I have shown a modification in which the valve member 19 is controlled by a hollow float 29 which is attached to the end of the lever arm 20 and takes the place of parts 22 to 26, inclusive. The pipes 30 and 31 are respectively the fill pipe and the vent pipe for the tank 2. The apparatus operates as follows:

Let us assume that the tank 2 contains gasoline and that the measuring bowl 8 is empty. The pump 12 is then operated and gasoline is transferred to the bowl 8 until it reaches the level of the upper end of the overflow pipe 13, when, if more gasoline is pumped into the bowl, it will overflow into the tank 14, which we will assume was empty at the beginning of this operation. The bucket 21 must, of course, have been filled with gasoline before the pumping started, as otherwise the valve 19 would have been open which would have rendered the pump inoperative for the purpose of transferring gasoline from tank 2 to bowl 8. If the pump should be operated for some time after the gasoline starts overflowing into the tank 14, the gasoline will accumulate in the bottom of this tank and its level will rise until it partially submerges the bucket 21. As the bucket 21 becomes submerged, it is evident that the weight of the liquid within is neutralized by the buoyant effect of the weight of the liquid on the outside until at last, a point is reached when the weight 26 will overcome the forces that tend to hold the valve member 19 in closed position and open the valve. If the pump is operated after the valve has opened, it will no longer transfer gasoline from the tank 2 but will merely circulate the liquid from tank 14 to the measuring bowl and return it through the pipe 13. If the bowl 8 is drained or partially drained while sufficient gasoline remains in tank 14 to keep the valve member 19 in open position, then when the pump is again operated, it will first of all remove liquid from tank 14 until the level therein drops sufficiently to permit the valve to close after which it will function to transfer liquid from the storage tank 2 to the bowl 8. Let us now assume that the bowl 8 is full and that it is desired to close the station for the night. The operator, in order to drain the bowl, opens the valve 32 in the bypass 33 and lets the contents of the bowl 8 drain into the underground tank 14 which, as before stated, must be of sufficient capacity to permit the contents of the bowl 8 to be received therein at any time. This makes it necessary to make the tank 14 of considerably greater capacity than the bowl 8 as the tank 14 is never completely empty.

With the construction shown, it is obvious that the tank 14 can readily be made tight as there are no pipes that pass through it below the liquid level, for all of the pipes enter this tank from the top. The modification shown in Fig. 3 is simple and its operation is obvious. The float 29 opens the valve when the liquid level rises above a predetermined point and closes it when the level falls below another predetermined point.

With the arrangement of parts described above, the foot valve 11 may be omitted although this is not considered to be the best practice, as by doing so the suction or supply pipe will drain back into the storage tank after each operation of the pump.

Having now described my invention what I claim as new is:

In an apparatus for dispensing liquid in measured quantities, having in combination, a storage tank adapted to be placed underground, a measuring bowl, adapted to be supported in an elevated position above the ground, a suction pipe connecting the storage tank with the measuring bowl, means for transferring a liquid from the storage tank to the measuring bowl, an overflow pipe extending upwardly into the measuring bowl and terminating near the top thereof, an overflow tank located below the measuring bowl, the lower end of said overflow pipe being in communication with the overflow tank and a vent pipe extending from the overflow tank to a point near the top of the measuring bowl, the combination with the overflow tank and the suction pipe of a pipe extending downwardly into the overflow tank from the top thereof, the lower end of said pipe terminating near the bottom of the tank, the upper end of said pipe being in communication with the suction pipe, a valve secured to the pipe within the overflow tank and means for opening said valve when the level of the liquid in the overflow tank is above a predetermined level and for maintaining the valve closed when the liquid level is below the predetermined level, said last named means comprising a lever pivoted intermediate its ends and having secured to one end a weight of high specific gravity and to the other end a weight whose torque tending to rotate the lever about its pivot is less than that exerted by the other weight, said second named weight comprising in part a box open at its top and adapted to contain a liquid.

In testimony whereof I affix my signature.

EMORY CROUSE.