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S. D. LOVE

LIQUID DISPENSING SYSTEM

Filed April 13, 1920

Fig. 1.

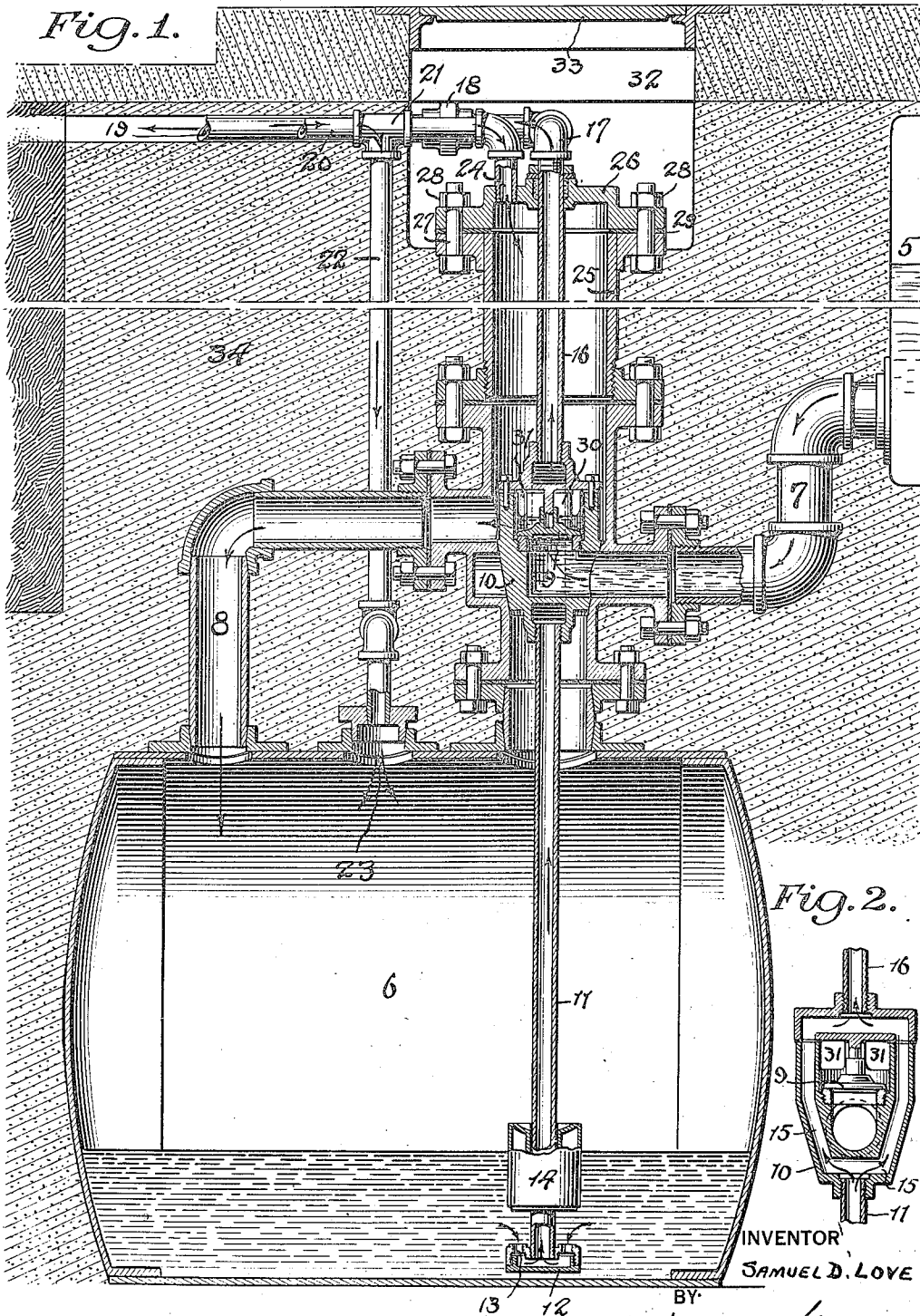
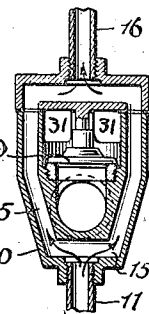


Fig. 2.



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SAMUEL DONNELLON LOVE, OF RAHWAY, NEW JERSEY, ASSIGNOR TO ALLEN PRESSURE SYSTEM CO. INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

LIQUID-DISPENSING SYSTEM.

Application filed April 13, 1920. Serial No. 373,634.

To all whom it may concern:

Be it known that I, SAMUEL DONNELLON LOVE, a citizen of the United States of America, residing at Rahway, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Liquid-Dispensing Systems, of which the following is a specification.

My invention relates to liquid dispensing systems, and particularly to the arrangement of the piping and valves controlling the discharge from the working tank in a system such as that described in the co-pending application of Charles McKay, Ser. No. 368,099, filed March 23, 1920. The object of my invention is to further simplify the piping and valve arrangement to facilitate the removal of the valves for repairs, replacement, etc.

In the accompanying drawing—

Fig. 1 is a vertical section of an installation in which my invention is embodied in one form; and

Fig. 2 is a section through the non-return valve fitting taken at right angles to that shown in Fig. 1.

The installation is in general of the type shown in the Allen Patent No. 1,237,144, and comprises a subterranean main reservoir or storage tank 5 and an associated small working tank 6, which, in the present construction, is filled by gravity from the main tank through the pipes 7 and 8. A non-return valve 9 mounted in the valve fitting 10 prevents the backward flow of the liquid through the pipe 7 when pressure is admitted to the tank 6 to discharge the latter.

The discharge pipe 11 for the working tank has a foot piece 12 with ports 13 in its upper face, which are closed by the float valve 14 sliding on the pipe 11, as described in the McKay application above mentioned. At its upper end the pipe section 11 is jointed to the valve fitting 10 and communicates through lateral by-pass channels 15 with the upper section 16 of the discharge pipe, and the latter is connected by suitable elbows 17 and coupling 18 with the main discharge pipe line 19, which, as here shown, is carried beneath the ground to a suitable point of discharge.

In order to effect a discharge of the working tank 6, a compressed air line 20 is used, which is connected by a T-fitting 21 with

the branch pipe 22 opening at 23 to the top of the working tank 6. The air line is also continued from the T-fitting 21 and opens at 24 to the top of the standard 25.

The upper portion of the standard 25 is of greater diameter than the lower portion, and the intermediate portion is coned to form a seat for the valve fitting 10, which is ground to make a snug fit with its seat in the standard. The lower portion of the standard is of sufficient diameter to permit the float valve 14 and foot piece 12 on section 11 of the discharge pipe to be drawn up therethrough.

At its upper end the standard is closed by a cap 26 secured in position by bolts 27, the nuts 28 for which are arranged above the cap. A washer 29 may be interposed between the cap and the top flange of the standard to maintain a tight joint.

It will be noted that the valve fitting 10 has a chamber 30 in which the valve 9 rises, and that this chamber communicates through ports 31 with the upper portion of the standard 25 as well as with the fill pipe 8 leading to the working tank. This construction simplifies the construction of the valve fitting 10. While the latter might be provided with a port opening only to the pipe 8 from the chamber 30, it is simpler to permit the liquid to flow into the standard 25, and an exact registry of the fitting 10 and the pipe 8 is thus not required.

The check valve 9 closes when the air line is opened, by reason of the pressure not only upon the liquid in the standard, but also upon the liquid in pipe 8. This connection to the air line at 24 is not essential, however, since the back pressure of the liquid in the pipe 8 upon the admission of air through the port 23 into the working chamber, would effect the same result alone. The connection is, however, desirable as an added precaution. Obviously, if the liquid level is so low that there is no liquid in the standard 25, the air pressure upon the liquid which is always in the valve chamber 30 closes the valve.

The operation of the device is readily understood. The apparatus is shown in the drawing in the condition in which it would be after a considerable quantity has been drawn from the working tank 6. The check valve 9 is shown seated under the pressure



of the air admitted through ports 23 and 24, and flow of liquid from the reservoir 5 to the working tank is cut off. Immediately the air is released from the working tank, the gravity pressure of the oil in the reservoir 5 lifts the check valve 9 and the liquid flows through the pipe 8 into the working tank, again filling the latter, and rising in the standard 25 to the level of the liquid in the reservoir 5. Even should the liquid rise to the level of the air line 20 and enter the latter, no harm would result, since the compressed air when again admitted would force the oil out of the air line and into the working tank.

In order to remove the valves for repairs, it is merely necessary to open the couplings between the pipe sections above the cap 26 of the standard, and remove the nuts 28 by which the cap is held in position. Upon lifting the cap 26, the discharge pipe, non-return valve fitting 10, float valve 14, and foot piece 12 are all withdrawn through the standard and may be readily repaired or replaced without disturbing the main installation. This arrangement has the advantage of eliminating the necessity for a working pit, such as is required in the McKay system, in order to obtain access to the check and gate valves. The gate valve is dispensed with in the present construction as unnecessary, since the liquid may rise in the standard 25, or even into the shallow chamber 32 in which the cap 26 is located, without seriously inconveniencing the workmen in the removal of the cap 26. Ordinarily, however, repairs would not be undertaken until the level of the liquid in the reservoir 5 is such that it rises in the standard 25 below the level of the cap 26. A manhole cover 33 is provided to cover the chamber. The construction has the further advantage that not only the main storage tank 5, but also the working tank 6 and associated parts may be buried in concrete or dirt 34, thus insuring greater safety from fire or explosion.

Various modifications in the system and arrangement of parts will readily occur to those dealing with the problem, without departing from what I claim as my invention.

I claim—

1. In a liquid dispensing system, a storage tank, a working tank filled by gravity therefrom, a standard rising from the working tank, a discharge pipe passing upward from the working tank through the standard, a non-return valve fitting arranged in said standard and connected to the discharge pipe and having a by-pass communicating with the latter, and a fill pipe opening through the standard to said non-return valve fitting and serving to convey liquid

from the storage tank to the working tank through the non-return valve passage in said fitting.

2. In a liquid dispensing system, a storage tank, a working tank filled by gravity therefrom, a standard rising from the working tank, a discharge pipe passing upward from the working tank through the standard, a non-return valve fitting arranged in said standard and connected to the discharge pipe and having a by-pass communicating with the latter, and a fill pipe opening through the standard to said non-return valve fitting and serving to convey liquid from the storage tank to the working tank through the non-return valve passage in said fitting, said non-return valve fitting, and discharge pipe being readily removable through the standard from working position without disturbing the installation of either the standard or the fill pipe.

3. In a liquid dispensing system, a storage tank, a working tank filled by gravity therefrom, a standard rising from the working tank, a discharge pipe passing upward from the working tank through the standard, a non-return valve fitting arranged in said standard and connected to the discharge pipe and having a by-pass communicating with the latter, and a fill pipe opening through the standard to said non-return valve fitting and serving to convey liquid from the storage tank to the working tank through the non-return valve passage in said fitting, in combination with a float valve on the discharge pipe within the working tank, said discharge pipe, float valve, and non-return valve fitting, being freely removable from the tank and standard without disturbing the installation of the latter.

4. In a liquid dispensing system, a working tank, a standard rising therefrom, a discharge pipe passing upward from the tank through said standard, a non-return valve fitting mounted in said pipe and freely seated in said standard and having a by-pass communicating with said discharge pipe, a fill pipe opening through said standard to the non-return valve fitting, a passage opening from the working tank to the non-return valve fitting to permit the filling of the tank through said fitting from the fill pipe.

5. In a liquid dispensing system, a working tank, a standard rising therefrom, a discharge pipe passing up through the standard from the working tank, a non-return valve fitting seated in the standard and connected to the discharge pipe, said fitting having a by-pass communicating with the discharge pipe, in combination with a fill pipe opening to the standard through the

non-return valve fitting, and a second pipe connecting the standard with the working tank, substantially as described.

6. In a liquid dispensing apparatus, a working tank, a standard rising therefrom, a discharge pipe rising through the standard, a non-return valve fitting arranged in said standard and associated with the discharge pipe, and means for filling the working tank through said non-return valve fit-

ting, a float valve arranged in the working tank on the discharge pipe, said discharge pipe being readily removable with its associated non-return valve fitting and float valve, through the standard for the purposes specified. 15

In testimony whereof I have signed my name to this specification.

SAMUEL DONNELLON LOVE.