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PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements relating to the Filling of Reservoirs with Liquefied Gas

We, LA NATIONALE S.A., a corporation organised under the laws of Switzerland, of 2 rue des Falaises, Geneva, Switzerland, and RONSON CORPORATION, a corporation organised under the laws of the State of New Jersey, United States of America, of 1, Ronson Road, Woodbridge, New Jersey, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to reservoirs for liquefied gas and to arrangements for filling such reservoirs with liquefied gas.

The transfer of a liquefied gas, retained under pressure in a refill vessel, to a reservoir which is intended to be filled, requires a series of precautions and this transfer cannot be effected in the same manner as the transfer of a liquid which does not gasify at normal temperature. It is an object of the present invention to provide for the satisfactory transfer of such liquefied gas.

According to the present invention, there is provided a liquefied gas reservoir including an inlet valve adapted for co-operation with the spout of a refill vessel containing a supply of liquefied gas whereby liquefied gas may be transferred from the refill vessel through the spout thereof into the reservoir, said valve comprising a body which is mounted on the wall of the reservoir and is formed to provide a well shaped to receive and locate the end of the spout of the refill vessel and having a single orifice at the bottom thereof opening into the interior of the reservoir, and a closure member mounted in the body on the reservoir side of the orifice and arranged normally to effect a fluid-tight closure of the orifice, said closure member being formed with a projection which extends with clearance into and, in the closed position of the valve, through the orifice for engagement by the end of the spout when inserted into the well whereby the closure member may be moved away from the orifice and to allow simultaneous passage through the clearance between the projection and the orifice of liquefied gas from the refill vessel into the reservoir and gas from the reservoir into the atmosphere, the said closure member and projection being also shaped to promote separation of the flows of the liquefied gas entering the reservoir and the gas leaving it.

An embodiment of the present invention will now be described with reference to the accompanying drawing which shows in sectional elevation an inlet valve for a liquefied gas reservoir of a smoker's lighter.

As shown, the valve comprises a body consisting of a cylindrical part 2 which is adapted to be screwed into a threaded opening in the wall of a reservoir (not shown). The part 2 is formed to provide a central well for receiving and locating the end 3 of the spout of a refill vessel and, at the bottom 4 of the well, a passageway leading from the well and having a single orifice 5 opening into the interior of the reservoir, the orifice being defined by an annular rib 6 which acts as a valve seat. The valve closure member comprises a circular flexible and resilient membrane 7 having an annular bead 8, which is secured to the bottom of the body 2, and a series of ports 9 disposed in a ring. The membrane 7 also has a projection 10 generally of conical form which extends through the orifice 5 and when the valve is closed into the well in the valve body. At least one slot or passage 11 is provided in the projection 8. When the end of the spout 3 is inserted into the well in the body 2 of the valve it will engage the projection 10 so as to move the membrane 7 away from the rib 6, the movement of the membrane being limited by engagement of the end of the spout with the bottom 4 of the well. In this position, which is that shown in the drawing, the valve is open and liquefied gas released from the

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refill vessel, which may be of the type having a valve which is opened by relative movement between the spout and the body of the vessel, will enter the reservoir by way of the slot or passage 11 and some of the ports 9, while part of the gas contained in the reservoir can exhaust to atmosphere by way of the other ports 9, the orifice 5, a radial groove 12 formed in the end of the spout 3, and clearance between the spout and the valve body 2. The cross-section of groove 12 is chosen so that when the end of the spout 3 is in engagement with the the bottom 4 of the well as shown a passage is formed of a cross section which is selected so as to regulate the flow of gas exhausting to atmosphere during the filling operation.

It will be appreciated that the shape of the closure member 7 and in particular the projection 10 thereof is such as to promote separation of the flows of the liquefied gas entering the reservoir and the gas leaving it, the slot or passage 11 in the projection 10 directing the liquefied gas flow laterally towards certain ports 9 whilst gas leaving the reservoir through other of the ports 9 will be directed towards the end of the spout 3 and towards the radial groove 12 therein.

WHAT WE CLAIM IS:—

1. A liquefied gas reservoir including an inlet valve adapted for co-operation with the spout of a refill vessel containing a supply of liquefied gas whereby liquefied gas may be transferred from the refill vessel through the spout thereof into the reservoir, said valve comprising a body which is mounted on the wall of the reservoir and is formed to provide a well shaped to receive and locate the end of the spout of the refill vessel and having a single orifice at the bottom thereof opening into the interior of the reservoir, and a closure member mounted in the body on the reservoir side of the orifice and arranged normally to effect a fluid-tight closure of the orifice, said closure member being formed with a projection which extends with clearance into and, in the closed position of the valve, through the orifice for engagement by the end of the spout when inserted into the well whereby the closure member may be moved away from the orifice to allow simultaneous passage through the clearance between the projection and the orifice of liquefied gas from the refill vessel into the reservoir and gas from the reservoir into the atmosphere, the said closure member and projection being also shaped to promote separation of the flows of the liquefied gas entering the reservoir and the gas leaving it.

2. A reservoir as claimed in claim 1, wherein the projection of the closure member is of generally conical shape and is formed with a slot which directs the flow of liquefied gas laterally of the closure member.

3. A reservoir as claimed in either preceding claim, wherein the orifice is bounded by a raised rib which forms a seat for the closure member.

4. A reservoir as claimed in any preceding claim, wherein the closure member comprises a resilient membrane which is mounted on the valve body so as normally to seal the orifice.

5. A reservoir as claimed in claim 3 and claim 4, wherein the membrane is fastened at its periphery on the valve body and is formed with a plurality of apertures in that part thereof which lies outside the part which engages the seat and through which the liquefied gas entering the reservoir and the gas leaving the reservoir flows.

6. A liquefied gas reservoir having an inlet valve constructed and arranged substantially as described with reference to the accompanying drawing.

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