

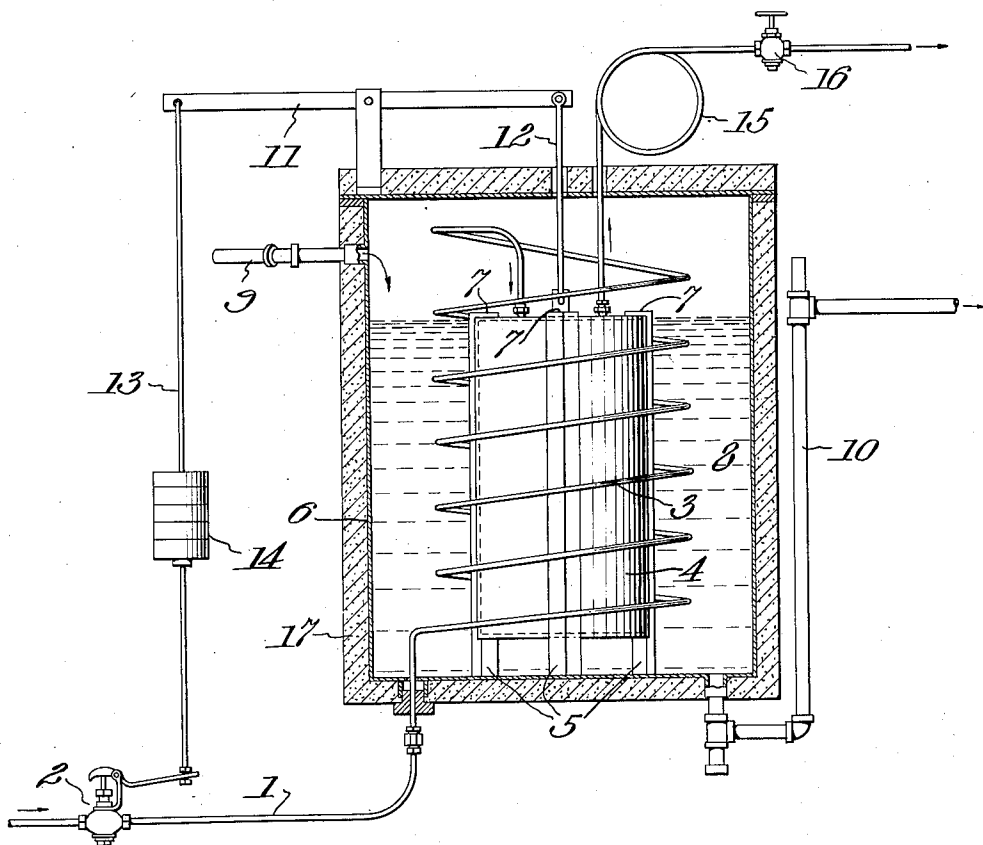
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J. M. ROWLAND

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GAS DISPENSING APPARATUS

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Inventor:

Jasper M. Rowland,

By *Byrnes, Downward & Potter*,
Attorneys.

UNITED STATES PATENT OFFICE

JASPER M. ROWLAND, OF NIAGARA FALLS, NEW YORK, ASSIGNOR TO HOOKER ELECTROCHEMICAL COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

GAS-DISPENSING APPARATUS

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This invention relates to a gas-dispensing apparatus. More particularly, it relates to an apparatus whereby a liquefied gas, such as liquid chlorine, may be vaporized and delivered in gaseous form to the point of use without any danger of liquid passing through the evaporator discharge along with the gas.

When it is desired to use chlorine in the gaseous phase and the chlorine is withdrawn from the source of supply in liquid phase, it has been found that the evaporators in common use sometimes allow a certain amount of liquid chlorine to pass through the evaporator and discharge with the gaseous chlorine, thereby causing considerable trouble. The particular object of this invention is to safeguard against such an occurrence and ensure the delivery of gaseous chlorine free from any liquid. The apparatus is also useful in case the gas supply is in a compressed gaseous state and tends to liquefy on expansion. In this case the apparatus is used in the gas line between the point of expansion and the point of use of the expanded gas.

The apparatus forming the subject matter of this invention consists essentially of a closed chamber, which is suspended in the air or in a liquid so as to be free to move vertically in response to a change in weight of its contents, a conduit controlled by a throttle valve through which the gas and/or liquid passes into the chamber from a source of supply of liquefied or compressed gas and means responsive to upward and downward movement of said chamber so as to cause opening and closing, respectively, of said valve.

The accompanying drawing shows a front elevation, partially in section of one specific embodiment of the apparatus designed especially for the dispensing of chlorine in gaseous form from a liquid supply thereof.

In the drawing, 1 is a pipe line leading from a source of supply of liquid chlorine (not shown) and controlled by throttle valve 2. This pipe line is connected to the coil 3 surrounding a float chamber 4 which is suspended between three vertical guides 5 situated in tank 6 which may be provided with an insulating covering 17. The guides are provided at the top with stops 7 which determine

the uppermost position of the float chamber. The tank contains a warm liquid 8 which is supplied thereto through inlet 9 and flows out through outlet 10. The float chamber is suspended from one end of a lever 11 by means of the connecting link 12. The other end of said lever is attached to the valve 2 by means of the link 13 carrying counter weights 14. Gaseous chlorine leaves the float chamber through the coiled pipe line 15 passing through the control valve 16 to the point of use. The coils 3 and 15 are flexible so that they offer no material resistance to the vertical movement of the float chamber.

Liquid chlorine passes through the coil 3 wherein it is caused to evaporate by the warm liquid 8 which may be any convenient liquid for the purpose which does not attack the materials of construction, such as water, anti-freeze solution or warm waste liquids. When the liquid chlorine passing through the coil 3 is fully evaporated, the float chamber 4 is filled with gaseous chlorine and floats in the high position causing throttle valve 2 to be wide open. In the event that the liquid chlorine is not completely evaporated in the coil, it collects in the bottom of the float chamber 4 until its weight overcomes the counter balance weight 14 causing the float chamber to sink thus closing the throttle valve 2 and checking the flow of liquid chlorine. The liquid chlorine in the float chamber is then supplied with heat from the surrounding liquid and evaporates. When sufficient liquid chlorine has evaporated, the chamber 4 again floats and opens the throttle valve. Should the supply of heating liquid 8 fail and the liquid level in tank 6 fall, the float chamber 4 will sink and cut off the supply of liquid chlorine.

Various modifications may be made in the apparatus illustrated without departing from the spirit of the invention. For instance, in some cases a special evaporator is not required so that coil 3 may be dispensed with and the pipe 1 directly connected to the top of the float chamber 4. Furthermore it is not necessary that the coil surround the float chamber but it may be in some other position in the tank or the liquid may be evaporated

outside the tank and by some form of evaporator other than that specifically illustrated. It is not necessary that the float chamber float in a liquid. It may be suspended in air by some form of lever and counterbalance arrangement such as that shown, by means of a spring or by any other convenient means, it being necessary only that it be so suspended as to be capable of upward and downward movement in response to change in weight of its contents. The operation of the throttle valve through such movement of the float chamber may obviously be accomplished by means other than the lever arrangement shown.

I claim:

1. A gas-dispensing apparatus comprising in operative combination, a closed chamber suspended so as to be capable of vertical movement in response to change in weight of its contents, a conduit discharging into said chamber, a throttle valve controlling said conduit, means for withdrawing gas from said chamber, and means responsive to downward and upward movement of said chamber so as to cause closing and opening, respectively, of said throttle valve.

2. A gas-dispensing apparatus comprising in operative combination, a closed chamber suspended so as to be capable of vertical movement in response to change in weight of its contents, a conduit connected to liquid evaporating means, a throttle valve controlling said conduit, a conduit connecting said liquid evaporating means with said chamber, means for withdrawing gas from said chamber and means responsive to downward and upward movement of said chamber so as to cause closing and opening, respectively, of said throttle valve.

3. A gas-dispensing apparatus comprising in operative combination, a tank, a float chamber suspended therein so that it is capable of vertical movement in response to change in weight of its contents, a coil in said tank discharging into said float chamber, a conduit connected to said coil, a throttle valve controlling said conduit, means for withdrawing gas from said float chamber and means responsive to upward and downward movement of said float chamber so as to cause opening and closing, respectively, of said valve.

4. A gas dispensing apparatus comprising in operative combination, a tank, vertical guides therein, a float chamber suspended between said guides so that it is capable of vertical movement in response to change in weight of its contents, a pipe coiled around said float chamber and discharging into the same, a pipe leading into said tank and connected to said coiled pipe, a throttle valve outside said tank controlling said last named pipe, a pipe for withdrawing gas from said float chamber, and means responsive to upward and downward movement of said float

chamber so as to cause opening and closing, respectively, of said valve.

5. A gas dispensing apparatus comprising in operative combination, a tank, vertical guides therein, a float chamber suspended between said guides so that it is capable of vertical movement in response to change in weight of its contents, a pipe coiled around said float chamber and discharging into the same, a pipe leading into said tank and connected to said coiled pipe, a throttle valve outside said tank controlling said last named pipe, a pipe for withdrawing gas from said float chamber, a lever suspended above said float chamber, a link connecting one end of said lever to the float chamber and another link connecting the other end of said lever to the throttle valve.

In testimony whereof, I affix my signature.

JASPER M. ROWLAND.