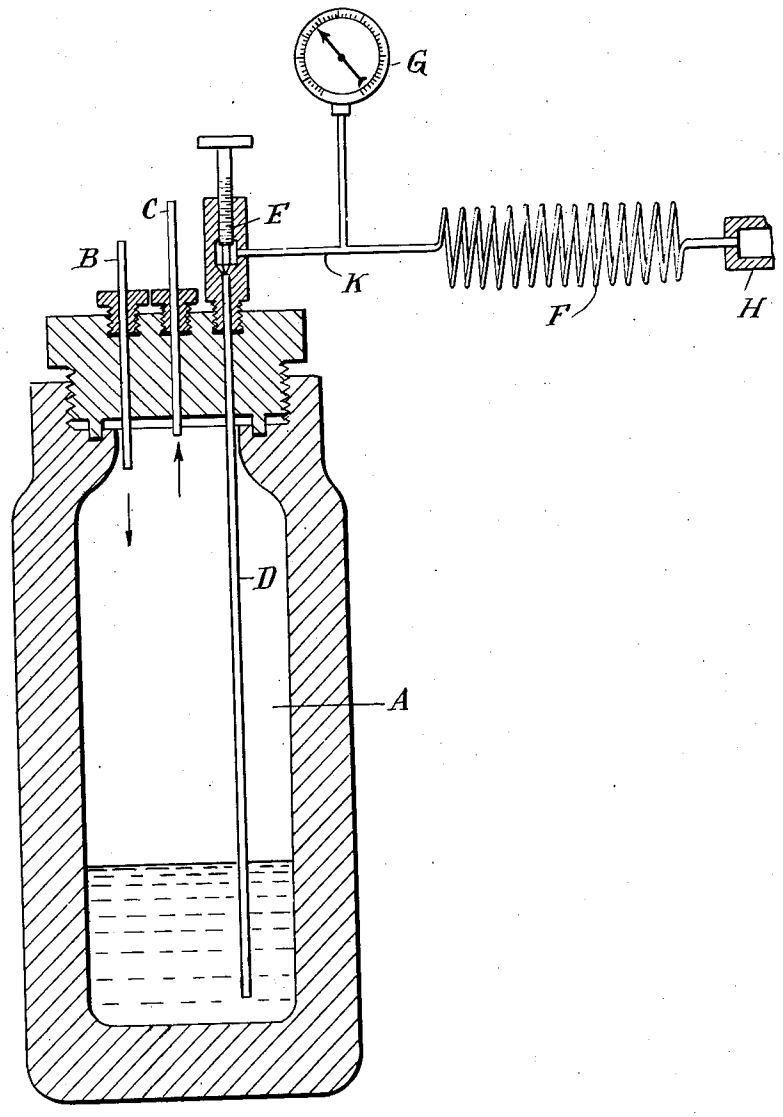
Aug. 4, 1925. 1,548,186

G. CLAUDE

DEVICE FOR THE WITHDRAWAL OF LIQUIDS UNDER GASEOUS PRESSURE

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UNITED STATES PATENT OFFICE.

GEORGES CLAUDE, OF PARIS, FRANCE, ASSIGNOR, BY MESNE ASSIGNMENTS, TO LAZOTE INC., A CORPORATION OF DELAWARE.

DEVICE FOR THE WITHDRAWAL OF LIQUIDS UNDER GASEOUS PRESSURE.

Application filed February 9, 1922. Serial No. 535,192.

To all whom it may concern:

Be it known that I, GEORGES CLAUDE, a citizen of the Republic of France, residing at Paris, Republic of France, have invented certain new and useful Improvements in Devices for the Withdrawal of Liquids Under Gaseous Pressure; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to devices for the withdrawal of liquids under gaseous pressure from receptacles therefor and has for its object the provision of an indicator permitting determination, without the necessity of employing a level indicating gauge, of the instant when the receptacle is practically emptied of liquid and the liquid at the point of withdrawal is replaced by gas. The present invention is of special applicability to apparatus where liquids such as liquefied carbon-dioxide and liquid ammonia are concerned.

According to the present invention the piping, through which the liquid under gaseous pressure is withdrawn from the receptacle containing it and delivered to a space at a lower pressure than that of the receptacle, is provided with means for opposing a resistance to the flow of fluids at or near the exit from the receptacle, means for opposing a second resistance to the flow of fluids after passage past the first resistance and prior to delivery, and means such as a pressure gauge located between the two resistances for the purpose hereinafter described.

It results from these resistances, which are so arranged as to create relatively important pressure reductions, that the pressure in the part of the piping which is between the two resistances is intermediate between the pressure in the receptacle and the pressure in the space of discharge. A pressure gauge is connected with this part of the piping so as to indicate the intermediate pressure, and at the moment when, upon drawing off, the liquid is replaced by gas, a rise of pressure is indicated by the pressure gauge which thus shows that the drawing off of the liquid is terminated.

In practice the first resistance to the passage of fluids may consist of a valve which opens or closes the opening through which the liquid is drawn off and which can be regulated at will to vary the extent of opening. The second resistance, placed in front of the extremity through which the discharge takes place, may consist of a tube of small diameter and of sufficient length, preferably in the form of a coil. This second resistance may also be created by inserting in the discharge tube a diaphragm having a small orifice through which the fluid is permitted to pass, or by terminating this tube with an orifice or mouthpiece of reduced cross-section. These arrangements may also be combined by using a tube of small diameter terminating in an orifice or mouthpiece of still further reduced section than that of the tube.

In order that the invention may be clearly understood and readily carried into effect, the same will now be described more fully with reference to the accompanying drawing which shows diagrammatically and by way of example one method of carrying out the present invention as applied to a separating receptacle for liquids and gases.

In the drawing A is the receptacle intended to contain the liquid under pressure which enters through the tube B, together with the gas which escapes through the tube C. A withdrawal tube or conduit D dips into the liquid and its upper portion is provided with an adjustable valve E. The valve is connected also to a conduit K and a tube F which is adapted to ensure a considerable loss of pressure in the current of fluid traversing it. For this purpose the tube F is, for example, formed of a coiled tube of small diameter. Between the tube F and the valve E a pressure gauge G, capable of indicating the highest pressure prevailing in the receptacle A, is connected to the conduit K. The tube F terminates in a low pressure conduit H into which it is intended to pass the liquid coming from the receptacle A.

It should be mentioned that if, during the withdrawal operation, an obstruction should for some reason occur in the tube beyond the pressure gauge connection, the pressure indicated by the gauge will increase until it reaches the pressure in the receptacle A; the pressure gauge G therefore must be capable of resisting this pressure.

From the foregoing, it will be seen that

a simple and useful device is provided whereby the separation of liquids from gases under pressure may be accomplished. The operator is enabled to accurately note the termination of flow of the liquid at the instant when such flow ceases. This is a material advantage in many operations and a result which is not obtainable so simply by use of ordinary level gauges.

Various changes may be made in the details of construction and arrangement of the parts without departing from the invention or sacrificing any of the advantages thereof.

I claim:

1. A device for the withdrawal from a receptacle of liquid under gaseous pressure contained therein, having a conduit through which the liquid is withdrawn from the receptacle and delivered to a space at a lower pressure than that of the receptacle, means for opposing a resistance to the flow of fluids from the receptacle, means for opposing a second resistance to the flow of fluids after their passage past the first resistance and prior to their delivery, and pressure indicating means located between the two resistances for the purpose hereinbefore specified.

2. A device for the withdrawal from a receptacle of liquid under gaseous pressure contained therein, having a conduit through which the liquid is withdrawn from the receptacle and delivered to a space at a lower pressure than that of the receptacle, a valve to oppose a resistance to the flow of fluids from the receptacle, a constricted tube to oppose a second resistance to the flow of fluids after their passage past the first resistance and prior to their delivery, and pressure-indicating means located between the two resistances for the purpose hereinbefore specified.

3. A device for the withdrawal from a receptacle of liquid under gaseous pressure contained therein, having a conduit through which the liquid is withdrawn from the receptacle and delivered to a space at a lower pressure than that of the receptacle, means for opposing a resistance to the flow of fluids from the receptacle, a tube of small diameter and considerable length to oppose a second resistance to the flow of fluids after their passage past the first resistance and prior to their delivery, and pressure-indicating means located between the two resistances for the purpose hereinbefore specified.

4. In a device for separating liquids from gases under pressure, the combination of a receptacle therefor having an outlet for the liquid, a conduit for the liquid leading from the outlet, means at the opposite ends of the conduit to resist the passage of the liquid therethrough and pressure indicating means connected to the conduit between the resistance means.

5. In a device for separating liquids from gases under pressure, the combination of a receptacle therefor having an outlet for the liquid, a conduit for the liquid leading from the outlet, an adjustable valve at the end of the conduit near the outlet, means at the other end of the conduit to resist the passage of liquid, and pressure indicating means connected to the conduit between the valve and resistance means.

6. In a device for separating liquids from gases under pressure, the combination of a receptacle therefor having an outlet for the liquid, a conduit for the liquid leading from the outlet, an adjustable valve at the outlet from the receptacle, a coiled tube of small internal diameter connected to the other end of the conduit to resist the passage of liquid therethrough, and pressure indicating means connected to the conduit between the valve and tube.

In testimony whereof I affix my signature.

GEORGES CLAUDE.