May 30, 1933. S. A. PEARSON 1,911,464

REFRIGERATING SYSTEM

Filed April 12, 1929 2 Sheets-Sheet 1

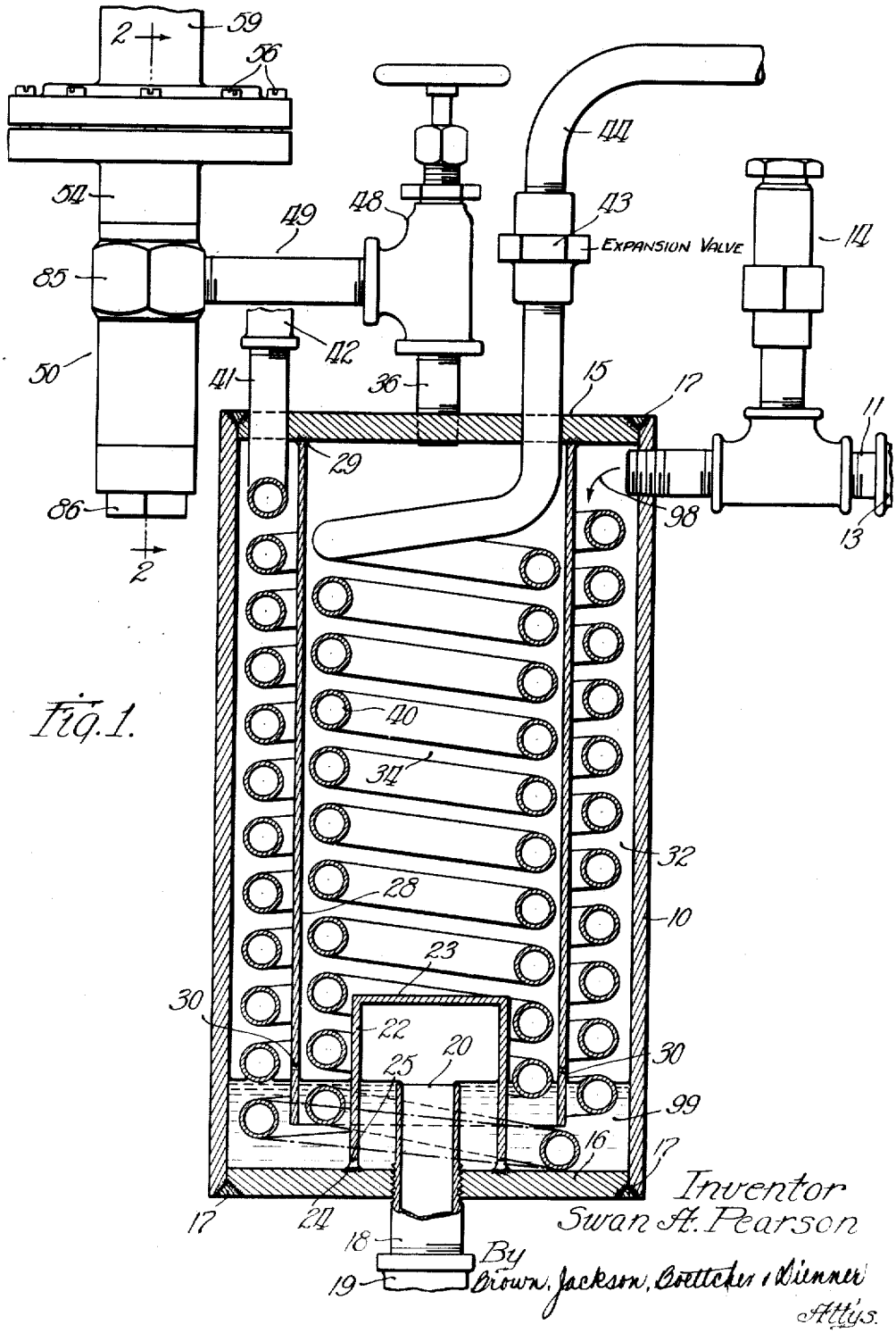


Fig. 1.

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Fig. 2.

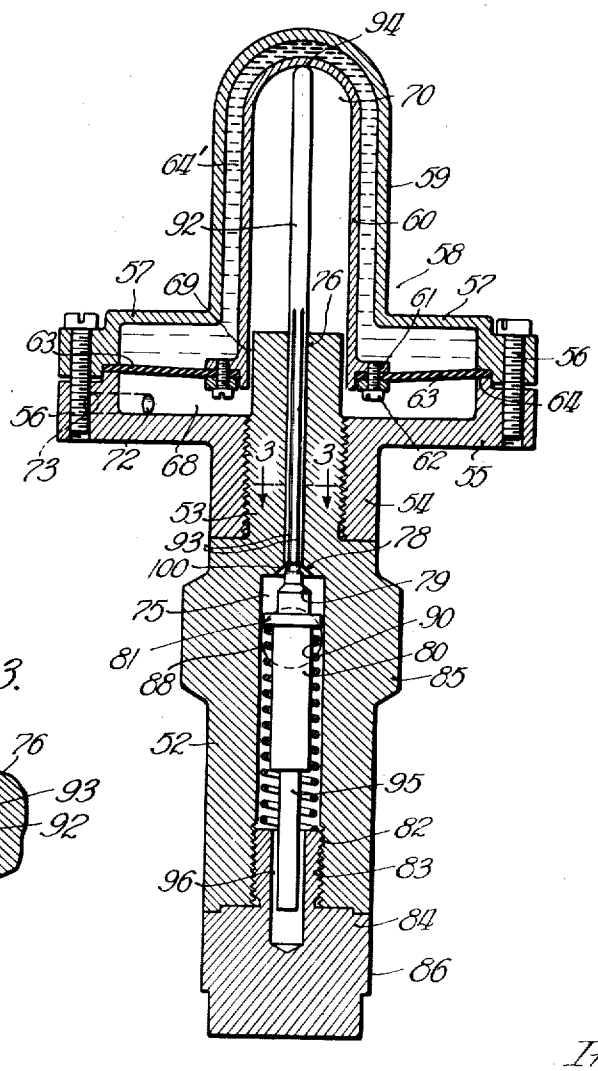
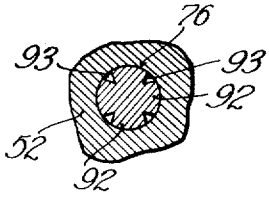


Fig. 3.



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Patented May 30, 1933

1,911,464

UNITED STATES PATENT OFFICE

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REFRIGERATING SYSTEM

Application filed April 12, 1929. Serial No. 354,479.

This invention relates to refrigerating systems and more particularly to a generally improved apparatus for removing foul or other foreign gases from the system.

I shall describe the invention in connection with the removal of deleterious gases and shall refer to certain illustrative examples; but it is to be understood that the invention is not limited to the removal of any particular gases but may be employed for removing any objectionable fluids whether in vapor or gaseous state.

It is well understood in the art that in a refrigerating system the higher the pressure the greater the refrigerating action in the system. The presence of non-condensible or relatively fixed gases in the system tend to reduce the capacity and efficiency of the system and are frequently dangerous; and it is the object of the present invention to provide a generally improved, simplified, efficient and inexpensive method for removing the foul gases or other objectionable fluids without throttling or reducing the desired high pressure in the system.

Another object is to return the liquid from the purging chamber through a path other than the path of gas entry into the chamber. Another object is the provision of an apparatus for removing foul or other objectionable fluids with a minimum of refrigerant loss. Another object is the provision of an improved counter-current cooling effect within the purging apparatus, and a more uniform distribution of the foul or objectionable gases about the cooling coils within the purging chamber. Another object is the provision of a trapping effect upon the foul gases within the purging chamber and a further object is the provision of an improved foul gas discharge regulator for removing the foul or other objectionable fluids automatically and without manual attention as well as without loss of an appreciable amount of the refrigerant.

Other objects and advantages of the present invention will more fully appear from the following detailed description taken in connection with the accompanying drawings which illustrate one embodiment of the invention and in which;

Fig. 1 is a view illustrating a more or less diagrammatic embodiment of the present invention with the purging chamber and cooling coil therefor in section;

Fig. 2 is a vertical sectional view through the automatic foul gas discharge regulator taken on the line 2—2 of Fig. 1; and

Fig. 3 is a fragmentary detail section taken on the line 3—3 of Fig. 2.

Referring to the drawings, the particular apparatus selected for illustration comprises a chamber 10. A pipe 11 leading from the receiver of the refrigerating system or from any other source which might have foul or other objectionable gases or fluids which it is desired to remove enters the chamber 10 preferably at the top thereof as shown. Foul gases are commonly trapped or collected in the top of the receiver and in that case the pipe 11 will preferably be connected with and lead from the top of the receiver. It is to be understood, however, that this is merely illustrative. Sometimes these gases are trapped in the condenser and in such case the pipe 11 would lead from the condenser, it being understood that the pipe 11 will have connection with the particular part of the system from which it is desired to remove the foul gases or fluids. Ordinarily the liquid in pipe 11 will be under full condenser or receiver pressure.

The details of the refrigerating system per se form no part of the present invention and may vary widely. The apparatus of the present invention may be quickly and easily installed with any existing or suitable refrigerating system, and where necessary the details of the apparatus of the present invention may be varied to accommodate it to different systems as desired.

So far as the details of the refrigerating system per se are concerned, suffice it to say that the liquid ammonia or other desired refrigerant, which may vary, is usually supplied under pressure to a suitable receiver from the condenser (not shown) to which the ammonia or other refrigerant is usually supplied in vapor form from the usual com-

pressor (not shown). The liquid refrigerant is supplied from the receiver to the usual refrigerating room or ice making tanks or coils (not shown) and in operation the ammonia, gas or other refrigerant is usually supplied from the compressor to the condenser where it is reduced in temperature sufficiently to render it liquid, after which it is usually conducted into the receiver usually with the pressure maintained. From the receiver the refrigerant is usually led to the refrigerating room or ice making tank or coils where it is allowed to expand and thereby cools the room or coils, and from the refrigerating room the refrigerant is drawn into the inlet side of the compressor and the cycle is repeated.

The foregoing is merely illustrative of refrigerating systems now in use and being a matter of common knowledge, that knowledge is incorporated herein by reference and disclosure in the drawings is believed unnecessary.

In a refrigerating system there are numerous sources of non-condensible gas accumulations. So far as a refrigerating system is concerned, atmospheric air is considered as a non-condensible gas and it, and the other gases which will be referred to, are intended to come within the general term "foul gas" or "foul fluid" as used herein. It is practically impossible to expel all of the air from the entire system even in starting up a new system, and after operation the air enters through leaky connections and the like. Decomposition of ammonia is another source of non-condensible gas. There are others but these are illustrative and will suffice. The line 11 is preferably provided with a globe, angle or other control valve 13 and also preferably with a release valve 14 for automatically relieving or venting excessive pressures in this line as is well understood in the art.

The top of the chamber 10 is closed by a top member 15 and the bottom is closed by a bottom member 16. The top and bottom members 15 and 16 may be spot welded in place as shown at 17 in Fig. 1, or otherwise secured suitably in place. The outlet or liquid spill pipe 18 leads from the bottom of the chamber 10 and is connected, for example, to the suction line of the compressor, or with any other part of the system to which it is desired to spill or return the liquid. The pipe line 18 is preferably provided with a globe, angle or other suitable control valve 19.

The pipe 18 is preferably provided within the chamber 10 with an upstanding end terminating at a suitable height above the bottom of the chamber in an open end 20 through which liquid in the chamber 10 above said open end 20 may enter the pipe 18.

To prevent access of the gases within the chamber 10 to the top of the pipe 18 when the liquid level within the chamber 10 is relatively low, the upper end of the pipe 18 is preferably surrounded by a cup-like member 22, preferably of circular section as is the chamber 10, although this may vary. The top of this cup-like member is closed at 23 and the lower end of the surrounding side wall is welded or otherwise suitably secured at 24 to the bottom member 16. Ports 25 through the side walls of the cup-like member 22 permit entry of the liquid from the bottom of the chamber 10 into the cup-like member 22 and to the upper end of the pipe 18. These ports 25 are preferably disposed down adjacent the bottom member 16 to be liquid sealed, even with only a relatively slight liquid level within the chamber 10.

A baffle 28, which may also be of circular section, although this may vary, is disposed preferably concentrically within the chamber 10 with its lower end open and concentrically surrounding the cup-like member 22 and terminating short of and preferably spaced above the bottom member 16 of the chamber 10.

The upper end of the baffle sleeve 28 preferably extends to the top member 15 and is welded or otherwise suitably secured thereto at 29. The baffle 28 is provided with a plurality of ports 30 arranged circularly around the baffle and preferably disposed at a level slightly above the upper open end 20 of the pipe 18 to be constantly uncovered due to the lower level liquid outlet. These ports 30 are for the entry of the non-condensible gases or at least the gases not condensed within the annular condensing space 32 between the baffle 28 and the wall of the chamber 10 through the ports 30 into the interior space 34 enclosed by the baffle 28. The non-condensed gases thus delivered to the space 34 are discharged into a foul gas outlet 36 leading from the top of the space 34 through the top member 15.

It will be apparent that flow of gases from the condenser or receiver through pipe 11 and valve 13 provides for a slight expansion of these gases and consequent cooling, since the gases, which are under condenser pressure, are discharged into the chamber 32, which chamber is provided with cooling coils which condense a portion of these gases and cool the remainder. This condensing and cooling action will necessarily result in a reduction of pressure of the gas, in accordance with established laws of thermodynamics. Consequently there will be a small drop in pressure from the pipe 11 to the chamber 32, which will result in a cooling effect, due to the expansion of the gases entering the chamber 32. However, the pressure in chambers 32 and

34, because of the restricted valved outlet, will still be considerably above atmospheric pressure, and the foul gases will be forced out through outlet 36 to the discharge valve. The pressure within the chambers 32 and 34 remains substantially constant, since any loss of pressure through the outlet 36 is compensated for by the fluid entering through pipe 11, and a substantially balanced pressure will be maintained during normal operation of the system.

Within the annular space 32 and the space 34 is preferably arranged an expansion or cooling coil 40, one end of which may be connected through a pipe 41 and valve 42 with the suction side of the compressor and the other end of which may be connected through an expansion valve 43 and pipe 44 with any suitable source of ammonia liquid or other refrigerant. The pipe 44 provides the inlet to the coil 40 from the bottom of the receiver or other refrigerant source and the pipe 41 provides the outlet from the coil 40 to the inlet side of the compressor.

The foul gas outlet 36 leads through a globe, angle or other valve 48 and pipe 49 to an automatic foul gas discharge regulator designated in its entirety at 50. This discharge regulator 50 comprises a body part 52 having a reduced threaded stem 53 extending upwardly therefrom for receiving a head member 54 which may be screwed thereon as shown. The head member 54 is enlarged at 55 and is clamped as by means of screws 56 to the lower similarly enlarged end 57 of a complementary head part 58. The head part 58 has an upwardly domed portion 59 and disposed substantially concentrically within this upwardly domed portion 59 is a similarly domed metallic shell 60, flanged at 61 and secured at 62 to the inner edge of an annular diaphragm member 63, the outer edge of which diaphragm member 63 is tightly clamped at 64 between the enlarged parts 55 and 57 of the complementary head members. The head member 58 with the diaphragm 63 and the domed shell 60 which is preferably relatively thin and of good conducting metal completely enclose a space 64' which is filled or substantially filled with an expansible fluid such as ammonia or ammonia in combination with some other fluid, although other fluids may be employed. The diaphragm 63 is preferably of rubber or leather which is not subject to corrosion and at the same time provides a sensitive and readily yieldable connection between the shell 60 and the head of the discharge regulator.

The upper enlarged part 55 of the head member 54 defines a space 68 which is in communication at 69 with interior 70 of the shell 60. A vent port 72 opens from the space 68 out at 73 from the head member 54 for discharging the non-condensible or other foul or undesirable gases. Internally the body part 52 has a passage 75 which is adapted to communicate through a reduced co-axial passage 76 with the interior 70 of the shell 60. Internally the body part is tapered at the entry of the passage 75 to the reduced passage 76 providing a tapered seat 78 against which a tapered shoulder 79 on the valve stem is adapted to seat and to close off communication from the passage 75 to the space 70. Beneath the tapered seating shoulder 79 the stem 80 is flanged at 81, this flange 81 fitting relatively snugly but having free sliding fit in the passage 75. The lower end of the passage 75 is internally threaded at 82 to receive the reduced threaded stem 83 of a cap member 84 which is threaded into and closes off the lower end of the passage 75. The body part 52 and the cap 84 may have external polygonal surfaces 85 and 86 respectively for engagement by a wrench or other suitable tool. A coiled spring 88 surrounds the stem 80 and is confined between the cap 86 and the flange 81 and normally urges the valve shoulder seat upward toward the cooperating valve seat 78.

The pipe 49 may be threaded into the body part 52 and the gases or other fluids discharged through the pipe 49 enter the passage way 75 through the passage way 90 shown disposed substantially normal thereto and constituting the inlet into the automatic foul gas discharge regulator.

The upper end of the valve stem 80 is reduced at 92 and this reduced upper end 92 preferably has a relatively close sliding fit in the passage 76. The periphery of that portion of the stem part 92 which operates in the passage 76 is provided with a plurality of longitudinal grooves 93 which are proportioned to provide communication between the enlarged passage 75 and the space 70 when the tapered valve shoulder 79 is unseated from the cooperating tapered seat 78 and the upper end of the stem 92 is preferably rounded at 94 and is held in contact with the upper rounded end of the shell 60 by the spring 88. The lower end of the stem 80 is reduced at 95 and is movable in an axial recess 96 in the cap member 86. The slotting of the valve stem part 92 at 93 provides the desired communication between the passage 75 and the space 70 for venting the foul gases from the space 70 through the space 69 and into the space 68 from whence said gases are discharged, for example, to the atmosphere through the ports 72.

In starting the system the foul gas discharge valve 79 is closed by backing off the hood 58 sufficiently to allow the spring 88 to seat the valve shoulder 79 upon the seat 78.

The valves 13 and 19 are opened and the expansion valve 43 is opened to permit a flow of refrigerant from the receiver or other source through the coil 40 and back to the suction side of the compressor. The expansion of the ammonia or other refrigerant in the coil 40 reduces the temperature in the chamber 10 sufficiently that any ammonia or refrigerant vapor carried off with the foul or contaminating gases through the pipe 11 and into the top of the chamber 10 as indicated by the arrow 98 in Fig. 1 is condensed. The refrigerating or cooling action in the coil 40 is preferably such as to cool the liquid or fluid down to the lowest possible temperature depending upon the suction pressure of the system. This condensation of a portion of the gases and cooling of the remainder will result in a consequent lowering of the pressure, the reduction in pressure of a gas being directly proportional to a reduction in temperature. To permit backing off the hood 58 without releasing the liquid seal between this hood and the diaphragm 63 the diaphragm may be secured marginally to the hood 58, if desired.

The opening of the valve 13 permits any foul, contaminating or other gases and any vaporized ammonia or vaporized refrigerant contained within the top of the receiver where the pipe 11 leads from the top of the receiver or contained within any other part with which the pipe 11 has communication to rise into the top of the chamber 10.

Any ammonia or refrigerant vapor is condensed and drops to the bottom of the chamber 10 as indicated at 99 in Fig. 1 and when the level of the liquid condensate rises sufficiently to enter the top of the stand pipe 20, it is returned or spilled through the pipe 18 from the bottom of the chamber 10 back to the receiver or to any other desired or suitable part of the system.

Any gases not condensed within the annular space 32 pass around the lower end of the annular baffle 28 or where the liquid has risen above the lower end of this baffle, as shown, pass through the ports 30 and into the space 34. It should be noted that the flow of refrigerant through the coil 40 is counter to the passage of gases or other fluids through the baffled chamber 10. The lesser cooling action provided at the top of the space 32 by the coil 40 condenses out the more readily condensible vapors or gases and the increased cooling action provided by the coil 40 downwardly through the space 32 and upwardly through the inner space 34 provides an increasing cooling action, serving to provide a more complete condensing out of the condensible vapors or gases in their passage through the chamber 10 and space 34. This counter-current effect is an important aspect of the invention. It should also be noted that the liquid is returned or spilled back through the pipe 18 and not through the same passage through which the gases are admitted to the chamber 10. This is another important aspect of the invention.

The non-condensible gases or at least the gases not condensed out by the time they reach the top of the space 34 and which I refer to herein as the foul gases, are discharged through the pipe 36, valve 48 and pipe 49 into the passage 75 of the discharge regulator through the passage 90. After starting, the hood 58 of the discharge regulator is screwed down enough to back off the valve shoulder 79 from the seat 78 just sufficiently to take off the foul gases, say, as formed, and without appreciable loss of ammonia gas. The foul gases entering the space 75 pass along the upper reduced end of the valve 92 through the grooves 93 and into the space 70 from where they are permitted to escape through the annular space 69, space 68, and through the ports 72 to atmosphere. If appreciable ammonia or other refrigerant enters the discharge regulator it will pass with the foul gases up into the space 70 and by an expansion effect or otherwise will reduce the temperature within the space 70. It is to be understood that the foul gases entering the chamber 32 and passing up through the chamber 34 will increase in temperature after leaving the chamber 34 and will not materially affect the temperature of the liquid 64′ in the expandible chamber. However, if a large percentage of vaporized liquid ammonia enters the chamber 32 from the pipe 11, its expansion upon entering the chamber after being released from the pressure that it has been subjected to in the pipe 11 will produce a marked cooling effect. The pressure existing in the chambers 32 and 34 is above atmospheric pressure, and this cooled gas, passing through valve 79 into chamber 70, which is at atmospheric pressure, due to the outlet 72 to atmosphere, will expand further, producing a still further decrease in temperature. As is apparent, a double expansion of the refrigerant gas takes place, with a resulting cooling effect, whereas with no refrigerant gas present, the tendency is for the temperature of the foul gases to increase after leaving chamber 34. This reduction in temperature, when refrigerant gases are present, will contract the liquid within the space 64′ and this contraction of this liquid will permit the valve 79 to rise under the action of the spring 88 and to seat upon the valve seat 78 and thereby automatically close the foul gas discharge regulator. For example, should the receiver fill with liquid and the condenser or drum fill with liquid ammonia or other refrigerant escap-

ing through the automatic valve, this refrigerant will contract the expansible liquid 64′ and close the valve automatically against loss of the refrigerant.

The apparatus may therefore be made wholly automatic for automatically opening the discharge regulator and for closing the same automatically depending upon the percentage of refrigerant discharge with the foul or objectionable gases. This is an important aspect of the invention. As the percentage of foul or non-condensible gases again increases the rise in the temperature within the space 70 will expand the expandible liquid in the space 64′ unseating the valve 79 for the automatic discharge of these foul gases to atmosphere through the ports 72.

A steady and continuous discharge of foul gases will take place in accordance with the percentage of non-condensible gases admitted into chambers 32 and 34 by pipe 11. If, due to lack of sufficient cooling within the chamber, uncondensed refrigerant gases pass through the outlet 36, the discharge valve will be automatically closed to prevent loss of refrigerant, this closing being effected by the cooling occasioned by the second expansion of the refrigerant gases as they pass from chamber 34 into the chamber 68, the valve 79 seating upon the valve seat 78, due to the contraction of liquid in the dome 59 of the valve.

Ordinarily, however, the reduction in pressure between pipe 11 and chamber 32 is small, and the cooling coils 40 will suffice, together with the cooling effected by the expansion of the gases upon the reduction in pressure occasioned by condensation and cooling, to condense all the refrigerant gases, and only a restricted discharge of the foul gases will continue to take place.

The reduced stem part 92 is reduced below the grooves 93 as by means of an annular slot 100 (Fig. 2) which provides for obtaining closer regulation. The foul gas openings 30 through the lower ends of the annular baffle 28 provide restrictions which produce a more even distribution of the gases about the coil 40, particularly within the annular space 32.

I do not intend to be limited to the precise details shown or described.

I claim:

1. The combination with a refrigerating system of a receptacle, a gas line connected to said receptacle for admitting condensable and non-condensable gases into the interior of the receptacle, an outlet for the discharge of non-condensable gas from said receptacle, means within the receptable for cooling the gases admitted therein so as to condense the condensable gas, baffle means disposed within the receptacle between said gas inlet and said non-condensable gas outlet and a condensate outlet leading from the bottom of the receptacle.

2. The combination with a refrigerating system of a receptacle, a gas line connected to said receptacle for admitting condensable and non-condensable gases into the interior of the receptacle, an outlet for the discharge of non-condensable gas from said receptacle, means within the receptacle for cooling the gases admitted therein so as to condense the condensable gas, baffle means disposed within the receptacle between said gas inlet and said non-condensable gas outlet, a condensate outlet leading from the bottom of the receptacle, means for trapping some of the condensate within the receptacle and means within the receptacle and adapted to be sealed by the condensate trapped in the receptacle for preventing entry into said condensate outlet of non-condensable gas admitted into the receptacle.

3. The combination with a refrigerating system, of a purging receptacle, a generally annular baffle forming a generally annular space within said receptacle, said baffle being closed at the top and open at the bottom to said generally annular space, a gas inlet line connected with the top of said generally annular space, a foul fluid outlet adjacent the top of the space within said generally annular baffle and a liquid outlet from the bottom of said receptacle.

4. The combination with a refrigerating system, of a purging receptacle, a generally annular baffle forming a generally annular space within said receptacle, said baffle being closed at the top and open at the bottom to said generally annular space, a gas inlet line connected with the top of said generally annular space, a foul fluid outlet adjacent the top of the space within said generally annular baffle, a liquid outlet from the bottom of said receptacle, said liquid outlet extending up into the bottom of the receptacle and forming a liquid trap and a hood surrounding said upwardly extending liquid outlet, said hood being closed at the top and having port means opening at the bottom from said generally annular space into said hood.

5. The combination with a refrigerating system, of a purging receptacle, a generally annular baffle forming a generally annular space within said receptacle, said baffle being closed at the top and open at the bottom to said generally annular space, a gas inlet line connected with the top of said generally annular space, a foul fluid outlet adjacent the top of the space within said generally annular baffle, a liquid outlet from the bottom of said receptacle, said liquid outlet extending up into the bottom of the receptacle and forming a liquid trap and a hood surrounding said upwardly extending liquid outlet, said hood being closed at the top

and port means opening through said baffle above the top of said upwardly extending liquid outlet.

6. The combination with a refrigerating system, of a purging receptacle, a generally annular baffle forming a generally annular space within said receptacle, said baffle being closed at the top and open at the bottom to said generally annular space, a gas inlet line connected with the top of said generally annular space, a foul fluid outlet adjacent the top of the space within said generally annular baffle and a cooling coil convoluted through said generally annular space and through the space within said baffle, said coil having an inlet at the top of the space within the baffle and an outlet at the top of the generally annular space.

7. The combination with a refrigerating system, of a purging receptacle, a generally annular baffle forming a generally annular space within said receptacle, said baffle being closed at the top and open at the bottom to said generally annular space, a gas inlet line connected with the top of said generally annular space, a foul fluid outlet adjacent the top of the space within said generally annular baffle, a liquid outlet extending up into the bottom of the chamber and forming a liquid trap and a hood surrounding said upwardly extending liquid outlet, said hood being closed at the top and a cooling coil convoluted through said generally annular space and through the space within said baffle, said coil having an inlet at the top of the space within the baffle and an outlet at the top of the generally annular space.

8. The combination with a refrigerating system of a receptacle, baffle means extending downwardly from the top of the interior of the receptacle and dividing the interior of the receptacle vertically into an inlet chamber and an outlet chamber, said baffle means separating the inlet chamber from the outlet chamber at the top and being open for communication between the inlet and outlet chambers adjacent the bottom, a gas line connected with the top of the inlet chamber for admitting condensable and non-condensable gases into said chamber, an outlet for the non-condensable gas at the top of the outlet chamber, means within the receptacle for cooling the gases admitted therein so as to condense the condensable gas and a condensate outlet leading from the bottom of the receptacle.

9. A foul fluid discharge regulator for refrigerating systems having an inlet and an outlet, said regulator comprising a body part having a passage therethrough, a valve controlling said passage and slidable therein, a hood forming with said body part an enclosed chamber, a flexible diaphragm clamped between said hood and said body part and dividing said chamber, a shell secured to said diaphragm and disposed within said hood to form an expandible fluid chamber between the shell and the hood and in communication with the chamber on one side of said diaphragm, the interior of said shell being adapted for communication with the valved passage through the body and having communication with the chamber on the other side of said diaphragm and a foul fluid outlet from said last side of said diaphragm chamber.

10. A foul fluid discharge regulator for refrigerating systems having an inlet and an outlet, said regulator comprising a body part having a passage therethrough, a valve controlling said passage and slidable therein, a hood forming with said body part an enclosed chamber, a flexible diaphragm clamped between said hood and said body part and dividing said chamber, a shell secured to said diaphragm and disposed within said hood to form an expandible fluid chamber between the shell and the hood and in communication with the chamber on one side of said diaphragm, the interior of said shell being adapted for communication with the valved passage through the body and having communication with the chamber on the other side of said diaphragm, a cap member closing the one end of the passage through the body part and a spring confined by said cap member and urging said valve member toward its seat and into cooperation with said shell.

11. The combination with a refrigerating system of a purging receptacle therefor, a line leading from the system to the interior of said purging receptacle for discharging foul fluids from said system to the interior of said receptacle, cooling means for the interior of the receptacle, and a liquid return line for spilling liquid from the purging receptacle independently of the path of delivery of the foul fluids to said receptacle and independently of the cooling means for the receptacle and the connections for said cooling means.

12. A foul fluid discharge regulator for refrigerating systems having an inlet and an outlet, a valve for said regulator, means forming a chamber expandible and contractible with temperature variations for automatically controlling said valve, the means forming said chamber including a flexible leather diaphragm disposed in the path of flow of the foul gases from the refrigerating system and through said regulator.

13. The combination with a refrigerating system of a receptacle having a purging chamber, a gas line connected to said chamber, means within said chamber for cooling the gases admitted therein so as to condense the entrained condensable gas, a condensate outlet at the bottom of the purging

chamber, means for trapping some of the condensate within said chamber, means adapted to be sealed by the condensate trapped within the chamber for preventing entry into said condensate outlet of noncondensable gas admitted to the chamber and an outlet for the noncondensable gas.

14. The combination with a refrigerating system of a receptacle having a purging chamber, means within said chamber for cooling the gases admitted therein so as to condense the entrained condensable gas, a condensate outlet at the bottom of the purging chamber, means for trapping some of the condensate within said chamber, means adapted to be sealed by the condensate trapped within the chamber for preventing entry into said condensate outlet of noncondensable gas admitted to the chamber, a hood over the condensate outlet and having port means below the level of the liquid adapted to trapped within said chamber and an outlet from the top of the chamber for non-condensable gas admitted to the chamber.

In witness whereof, I hereunto subscribe my name this 8th day of April 1929.

SWAN A. PEARSON.

CERTIFICATE OF CORRECTION.

Patent No. 1,911,464. May 30, 1933.

SWAN A. PEARSON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 7, line 10, claim 14, before "means" insert the words "a gas line connected to said chamber,"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of August, A. D. 1933.

M. J. Moore.

(Seal) Acting Commissioner of Patents.

chamber, means for trapping some of the condensate within said chamber, means adapted to be sealed by the condensate trapped within the chamber for preventing entry into said condensate outlet of noncondensable gas admitted to the chamber and an outlet for the noncondensable gas.

14. The combination with a refrigerating system of a receptacle having a purging chamber, means within said chamber for cooling the gases admitted therein so as to condense the entrained condensable gas, a condensate outlet at the bottom of the purging chamber, means for trapping some of the condensate within said chamber, means adapted to be sealed by the condensate trapped within the chamber for preventing entry into said condensate outlet of noncondensable gas admitted to the chamber, a hood over the condensate outlet and having port means below the level of the liquid adapted to trapped within said chamber and an outlet from the top of the chamber for non-condensable gas admitted to the chamber.

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