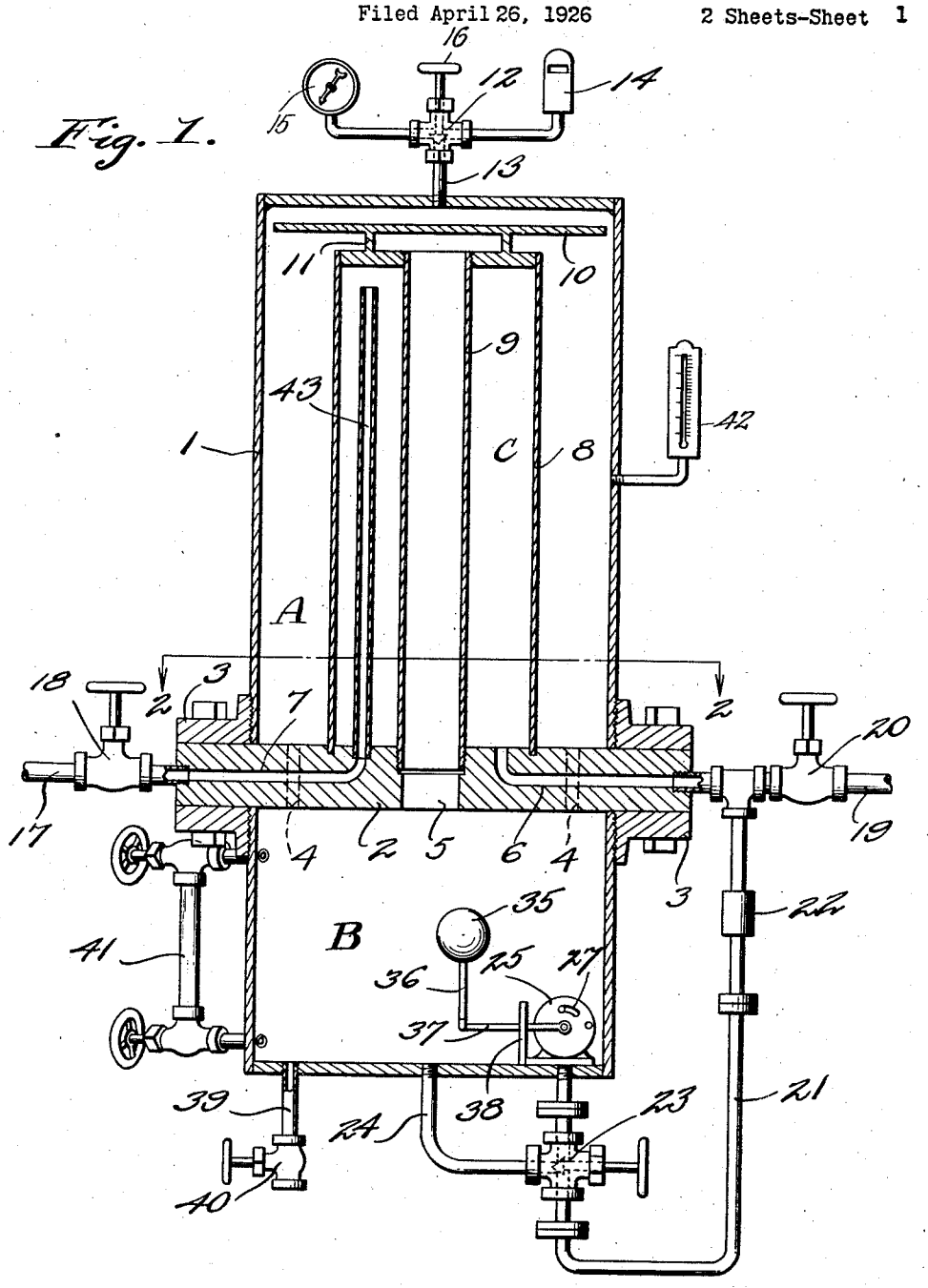
Oct. 16, 1928. 1,687,597

D. C. SPRINGER

AIR AND FOUL GAS EJECTOR FOR GAS SYSTEMS

Filed April 26, 1926 2 Sheets-Sheet 1

Fig. 1.



Daniel C. Springer
INVENTOR

BY Victor J. Evans
ATTORNEY

WITNESS:

Oct. 16, 1928.

1,687,597

D. C. SPRINGER

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Fig. 2.

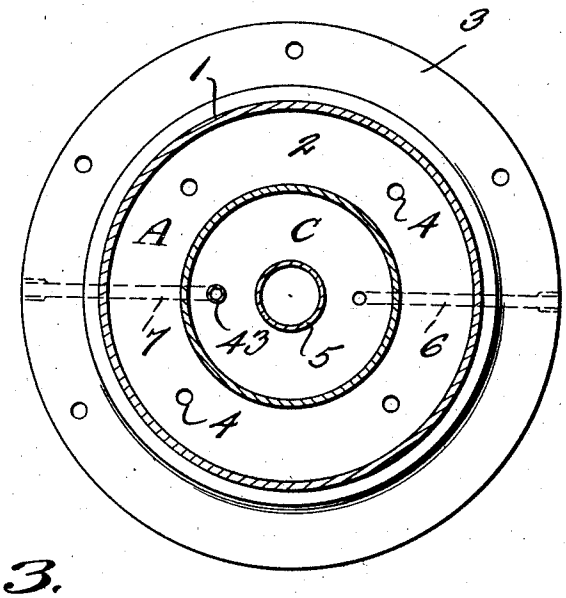


Fig. 3.

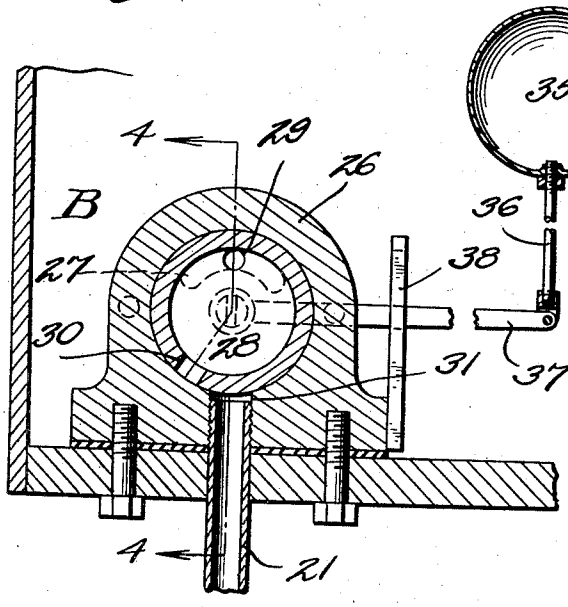
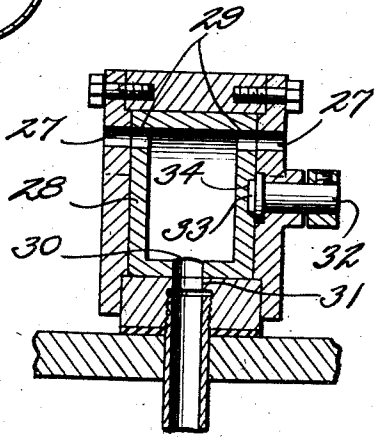


Fig. 4.



Daniel C. Springer
INVENTOR

BY Victor J. Evans
ATTORNEY

R. E. Wise
WITNESS:

Patented Oct. 16, 1928. 1,687,597

UNITED STATES PATENT OFFICE.

DANIEL C. SPRINGER, OF DONORA, PENNSYLVANIA.

AIR AND FOUL-GAS EJECTOR FOR GAS SYSTEMS.

Application filed April 26, 1926. Serial No. 104,860.

This invention relates to means for separating air and non-condensible gases from gas systems of refrigerating plants using ammonia or carbon dioxide, the general object of the invention being to provide means whereby the condensible gases will be condensed in a chamber which is provided with a poppet valve for permitting the air and non-condensible gases to escape, with means for returning the condensed liquid to the system.

Another object of the invention is to provide a rotary valve which is float operated for controlling the flow of the liquid from the condenser chamber to the system.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing my invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a longitudinal sectional view through the invention.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a sectional view through the rotary valve, its float and a portion of the casing.

Figure 4 is a section on line 4—4 of Figure 3.

In these views, 1 indicates a casing which is divided by a partition 2 into a chamber A and a chamber B, the partition being of greater diameter than the casing and the two parts of the casing having flanges 3 which are bolted to the projecting part of the partition, as shown in Figure 1. The partition is provided with the perforations 4 for connecting the two chambers together and with a central opening 5, and it is also provided with a passage 6 and a passage 7 which pass from the top face of the partition through the side edge thereof. A cylinder 8 is mounted on the partition and forms therewith a chamber C. A pipe 9, threaded in the hole 5, passes through the top of the cylinder 8 and connects the chamber B with the top of chamber A. A baffle plate 10 is supported by the posts 11 from the top of the cylinder 8 and is spaced from the top of the chamber A. A valve casing 12 is connected with the top of the chamber A by a pipe 13 and a poppet valve 14 is connected with one side of the valve casing and a gauge 15 is connected with the opposite side, the stem and handle of the valve in casing 12 being shown at 16. This valve controls the flow of fluid to the poppet valve 14 and the gauge 15. The passage 7 is connected by a pipe 17 with the suction line of a compressor of a refrigerating apparatus and this pipe contains a valve 18. A pipe 19 connects the passage 6 with the receiver of the machine, this pipe containing a valve 20 and a pipe line 21 connects the bottom of the chamber B with the pipe 19. This line 21 contains a check valve 22 and a valve 23, said valve 23 controlling a branch 24 which is provided to drain the chamber B. The check valve prevents fluid above the valve from returning to the chamber B through the pipe 21. A rotary valve 25 has its outlet connected with the line 21 and is arranged in the chamber B. This valve comprises a casing 26 which has an arc-shaped port 27 in each side thereof and a cylindrical valve member 28 rotatably mounted in the casing. This member 28 has the ports 29 therein for registering with the ports 27 and the port 30 for registering with the port 31 in the bottom of the casing and which is connected with the line 21. The stem 32 is rotatably mounted in the casing and has a flat projection 33 thereon engaging a slot 34 formed in one end of the valve member 28 and the float 35 has its stem 36 fastened to an arm 37 which is connected with the stem so that the movement of the float will be communicated to the stem and the projection 33, engaging the slot 34, will cause the member 28 to move with the stem. A guide 38 is provided for the arm 37.

An air and gas line 39, having a valve 40 therein, connects the bottom of the chamber B with the tops of the receivers and condensers of the refrigerating apparatus. A sight gauge 41 is provided for the chamber B and a thermometer 42 is connected with the interior of the chamber A.

The valves of the sight gauge and valves 12 and 18 are open, valve 23 adjusted to close the branch 24 and valve 20 is opened to a slight extent to let some of the liquid from the receiver expand into the cooler or chamber C, thereby bringing the temperature of the chamber A to a low degree. Then valve 40 is opened to a slight extent so as to admit air and gas from the condensers or receivers

into the chamber B. This air and gas will pass up through the perforations in the partition and through the pipe 9 into the chamber A and due to the low temperature of this chamber, the condensible gases in the mixture will be condensed and fall to the bottom of the chamber A and through the perforations 4 into the chamber B. The air and non-condensible gases will pass to the top of the chamber A and flow around the baffle plate 10 and pass out through the poppet valve 14 which is adjustable so that the valve can be set to open when the pressure in the chamber A reaches the desired point or degree. When the liquid in the chamber B reaches a level where it will raise the float 35, the valve member 28 will be turned so that its ports will be in register with the ports of the casing and thus the liquid will flow through the valve into the line 21 through which it will be drawn through passage 6 into chamber C where the liquid is vaporized and this vapor will pass from this chamber through the pipe 43 into the suction line 17. Thus the air and foul or non-condensible gases will be ejected from the system and the action will be automatic after the valves have been set.

It is thought from the foregoing description that the advantages and novel features of my invention will be readily apparent.

I desire it to be understood that I may make changes in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claim.

What I claim is:—

An air and gas ejector for a gas system of a refrigerating apparatus using ammonia or carbon dioxide comprising a casing, a partition therein dividing the same into upper and lower chambers, a cylinder supported on the partition and arranged in the upper chamber, means for introducing a cooling medium into the cylinder, means for connecting the interior of the cylinder with the compressor of the refrigerating apparatus, a poppet valve connected with the upper chamber, means for introducing a mixture of non-condensible gas and vaporized refrigerant into the lower chamber, means permitting the mixture to pass into the upper chamber, a float controlled rotary valve in the lower chamber for controlling the discharge of the liquids of condensation and means for connecting the discharge of the valve with the interior of the cylinder.

In testimony whereof I affix my signature.

DANIEL C. SPRINGER.