

June 6, 1967

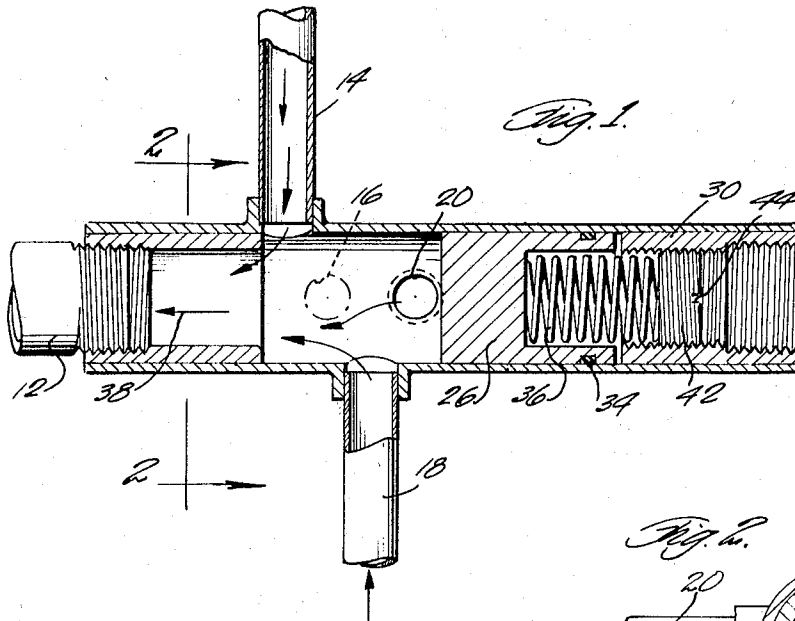
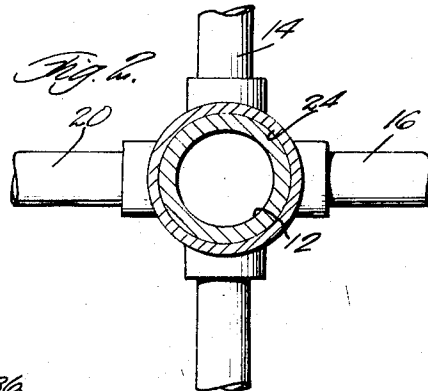
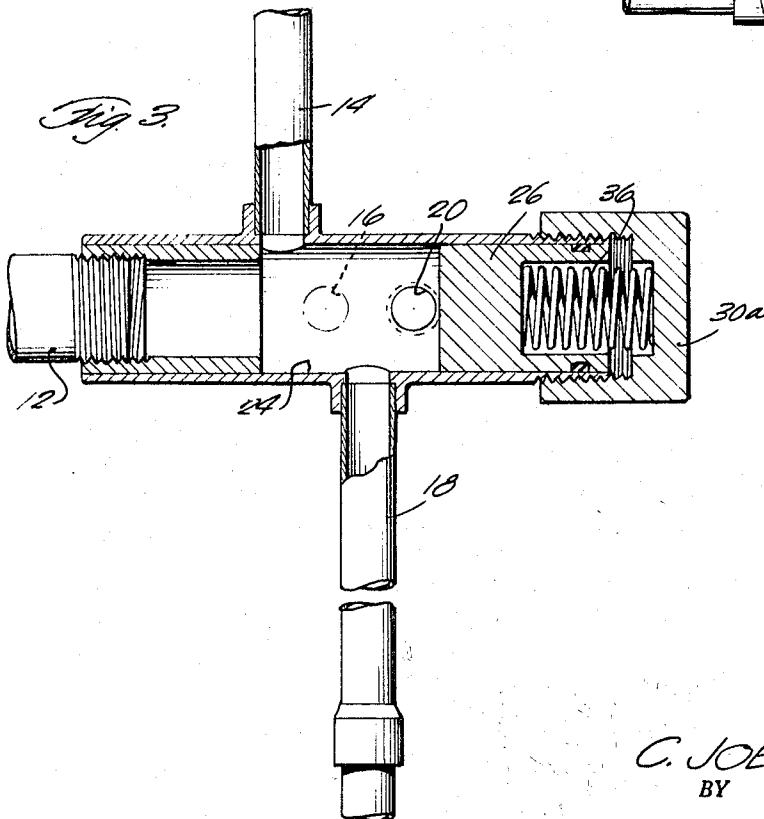
C. J. FISHER

3,323,318

LOW AMBIENT HEAD PRESSURE STABILIZER SYSTEM

Filed March 24, 1965

2 Sheets-Sheet 1



INVENTOR.
C. JOE FISHER
BY

*Victor J. ...
Attorneys*

June 6, 1967

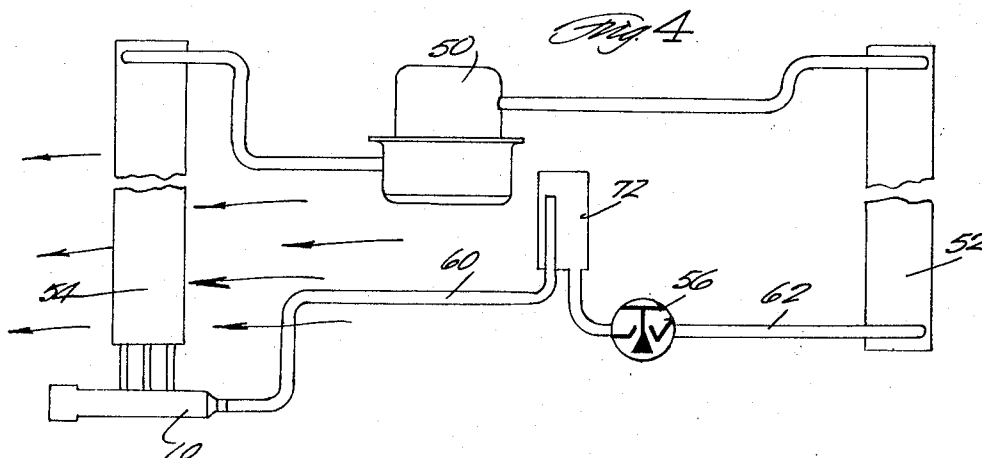
C. J. FISHER

3,323,318

LOW AMBIENT HEAD PRESSURE STABILIZER SYSTEM

Filed March 24, 1965

2 Sheets-Sheet 2



INVENTOR.

C. JOE FISHER

BY

Victor J. Evans & Co.
Attorneys

1

3,323,318

LOW AMBIENT HEAD PRESSURE STABILIZER SYSTEM

C. Joe Fisher, 505 E. Hadley St.,
Aurora, Mo. 65605

Filed Mar. 24, 1965, Ser. No. 442,422
2 Claims. (Cl. 62-196)

The present invention relates to a low ambient head pressure stabilizer system for use in conventional air conditioners and refrigeration systems and the like, and more particularly in this respect has reference to a pressure stabilizer means for effecting more efficient operation by means of providing a pressure sensitive means so that upon increased pressure of the internal vapor of the system, auxiliary and additional cooling paths are provided that pass through the condenser for shunting off the excessive pressure of the vapor and provide stabilization of the system under significant load conditions.

An object of the invention, therefore, is to provide a new and improved head pressure stabilizer means in a conventional air conditioner or refrigeration system for the purpose of maintaining close-to-normal head pressures during low outdoor ambient temperature conditions. Since during cool weather conditions, air conditioners or refrigeration systems have a decrease in head pressures, even to the point where the expansion valve metering device loses some of its efficiency, the present invention provides a means of reducing the shunt paths on the condensing area and thereby maintains a near-to-normal head pressure within the range wherein the expansion valve functions most efficiently.

A further object of the invention is to provide a stabilizer means that may be field adjustable to compensate for subnormal conditions or refrigerants of different pressure characteristics. The stabilizer means may have a number of outlets for providing in series additional or a reduction in the number of shunt paths in the condenser as the plunger or cylinder piston of the stabilizer means is axially displaced along the stabilizer as a result of the changes in pressure.

The above and other objects and advantages of the invention will become apparent upon full consideration of the following detailed description and accompanying drawings wherein:

FIGURE 1 is a cross-sectional view of a stabilizer means including a permanently open inlet and outlet port and a plurality of inlet ports selectively closed and opened in series by means of a pressure responsive plunger, for use in air conditioner and refrigeration systems, and which is the preferred embodiment of the invention. This device is field adjustable to permit its use with refrigerants having different pressure characteristics.

FIGURE 2 shows a cross-section taken along lines 2-2 of FIGURE 1;

FIGURE 3 shows a modification in which the stabilizer means is shown as being pre-set and of a non-adjustable type; and

FIGURE 4 shows a system using the stabilizer means of the present invention on the output side of a condenser.

Referring now to the drawings, there is shown a stabilizer means 10 which includes an outlet port 12, and a series of axially disposed inlet ports 14, 16, 18 and 20, with the inlet port 14 being permanently open into a piston chamber 24, and a piston 26 is disposed to slide along the length of the piston chamber 24, but the normal position of the piston 26 is at the closed end 30 of the piston chamber 24. The piston 26 is shown being provided with an O-ring 34 to provide a sealing effect between the piston 26 and the piston chamber 24. A spring 36 is disposed be-

2

tween the end 30 and the piston 26 for providing positive spring bias therebetween, and the piston is displaced depending upon the amount of pressure or a fluid applied to inlet port 14, as shown by the arrow 38 in schematic fashion.

The position of the piston 26 and the end 30 may be adjusted by means of adjusting means 42. Adjusting means 42 includes a slot 44 that provides for turning by means of applying a screw driver thereto.

FIGURE 2 shows outlet ports that are connected to the piston chamber 24. FIGURE 3 shows that the stabilizing means may be constructed so that the end means 30a is not readily disposed for adjustment as is available by means of the structural embodiment of FIGURE 1.

The stabilizer means may be installed in the refrigeration or heat exchange systems shown in FIGURE 4.

FIGURE 4 shows the stabilizer unit 10 connected on the outlet end of the condenser coil and apparatus 54. Therefore, the stabilizer unit or means 10 is shown connected in circuit between the outlet of the condenser coil and apparatus 54 and line 60, which line also includes a receiver 72.

When the atmospheric temperature drops, the pressure within the inlet port 14 will also drop and its effect against the piston 26 in chamber 24 will be reduced permitting the piston to recede in the chamber and cut off substantially any or all of inlet ports 16, 18, 20 etc. In this case, one circuit only, the one leading to inlet port 14, will provide the liquid refrigerant to the outlet port 12 and the receiver and head pressure will remain somewhat steady. On a rise in ambient temperature, the reverse will take place in that an increase in pressure within chamber 24 will exert additional effort against piston 26 causing it to move toward the spring end of the unit and open additional inlets 16, 18, and 20 as is required to maintain the desired pressure.

The stabilizer unit 10 may include a bleeder tube from spring area to low side for providing and preventing any possibility of hydraulic counter-action on the spring end of the piston.

Additional embodiments of the invention in this specification will occur to others and therefore it is intended that the scope of the invention be limited only by the appended claims and not by the embodiments described hereinabove. Accordingly, reference should be made to the following claims in determining the full scope of the invention.

What is claimed is:

1. A low ambient head pressure stabilizer means for air conditioning systems and refrigeration systems and the like, comprising a compressor for receiving gas at low pressure and producing gas under high pressure, a condenser having shunt paths therein for receiving gas under pressure from a compressor and discharging refrigerant produced from said gas when cooled through said stabilizer means connected to outlet ends of the condenser paths and including a piston in a cylinder chamber and a spring for biasing said piston from one of the ends thereof, an outlet port at the other end thereof and common to the outlet area of the cylinder and an inlet port permanently open for receiving said high pressure liquid and for displacing said piston upon excessive pressures to provide additional available ports for the flow of said refrigerant liquid from the shunted paths or circuits of the condenser and on to the receiver, the expansion valve and the evaporator of said system.

2. A low ambient head pressure stabilizer means for heat exchange systems comprising a compressor for receiving a refrigerant vapor at low pressure and producing a refrigerant vapor under high pressure, a condenser for receiving said high pressure refrigerant and discharging

3

a liquid therefrom, a receiver for retaining the surplus refrigerant liquid under normal temperature conditions, an expansion valve controlling the refrigerant flow, an evaporator for receiving said liquid refrigerant and producing a gas upon a heat exchange effect thereof, and a pressure stabilizer means included in said system between the outlet circuits of the condenser and the evaporator in which said pressure stabilizer means includes a chamber, a piston and a spring bias means for displacing the piston from the closed end thereof, an inlet port for receiving said refrigerant under said pressure for displacing the piston against said spring bias means for pro-

5

10

4

viding discharge of said refrigerant through additional ports selected upon the amount of displacement of said piston as a result of the high pressure refrigerant acting thereupon.

References Cited

UNITED STATES PATENTS

2,564,310	8/1951	Nussbaum	62—196
3,110,162	11/1963	Gerties	62—196
3,153,913	10/1964	Brody.	

MEYER PERLIN, *Primary Examiner.*