

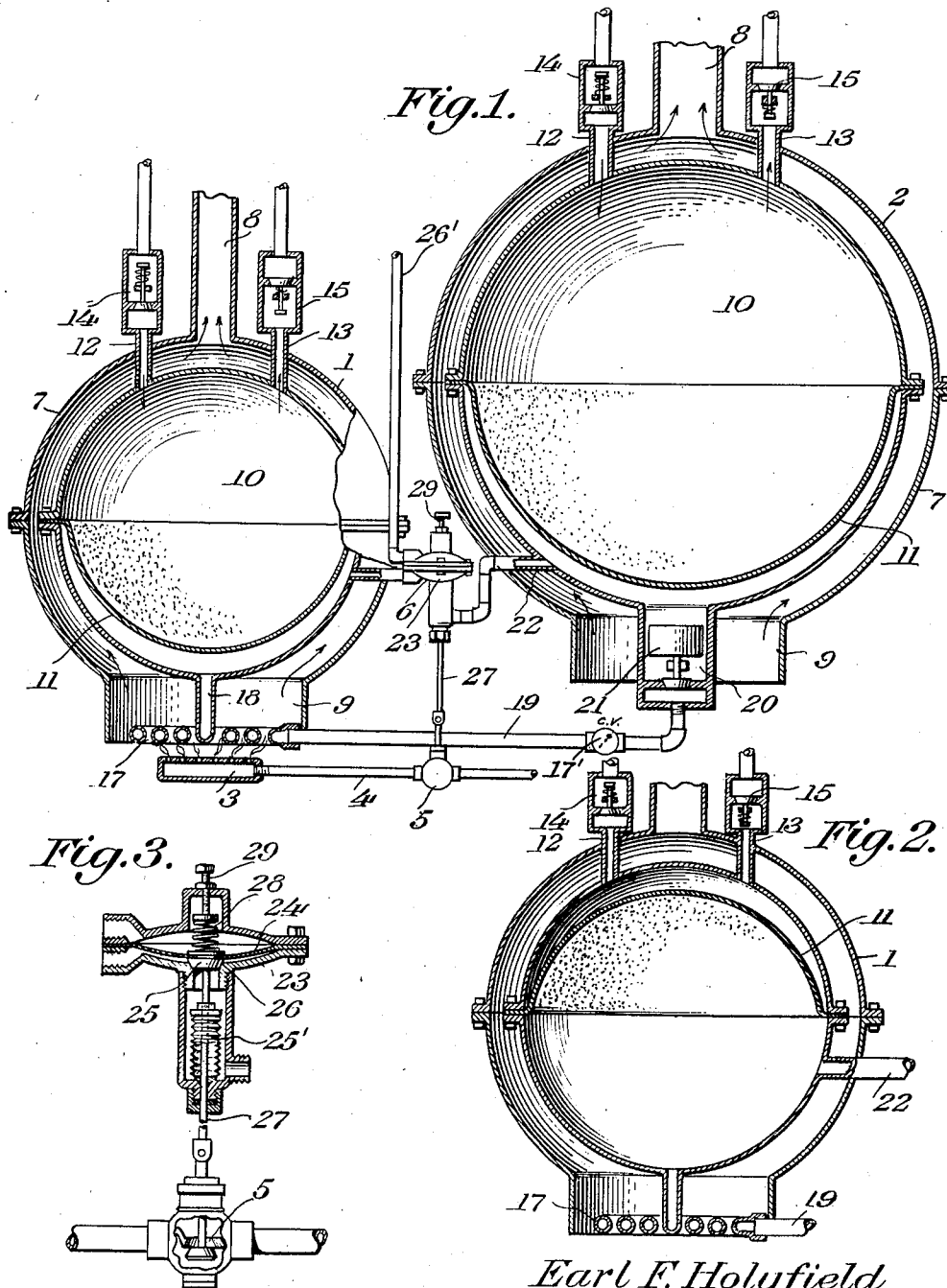
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E. F. HOLYFIELD

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REFRIGERATION COMPRESSOR

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Earl F. Holyfield

INVENTOR

BY Victor J. Evans & Co.

ATTORNEYS

WITNESS

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REFRIGERATION COMPRESSOR

Earl F. Holyfield, Stillwater, Okla.

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This invention relates to refrigeration systems and more particularly to compressors therefor, and has for the primary object the provision of a heat actuated compressor for acting on the refrigerant to transfer the latter from the evaporator to the condenser of the system under a desired pressure and which will be efficient in operation.

Another object of this invention is the provision of a system wherein multiple compressors are employed and so connected that the expansion and driving agent of one compressor may also act to operate the other compressor.

With these and other objects in view, this invention consists in certain novel features of construction, combination and arrangement of parts to be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawing, in which

Figure 1 is a fragmentary vertical sectional view showing compressors constructed in accordance with my invention, and connected to a refrigeration system.

Figure 2 is a fragmentary vertical sectional view illustrating one of the compressors.

Figure 3 is a fragmentary vertical sectional view illustrating a control mechanism between the compressors for regulating the fuel to the burner.

Referring in detail to the drawing, the numerals 1 and 2 indicate compressors connected to refrigeration systems for the purpose of transferring refrigerants from the evaporators to the condensers of said systems. The only difference between the systems and compressors is that the system having the compressor 1 employs a refrigerant of a higher condensing pressure than that employed in the system to which the compressor 2 is connected. The compressors 1 and 2 may be similarly constructed and by reference to Figure 1 it will be noted that the compressor 1 is associated with a heat source preferably in the form of a burner 3 supplied with a gaseous fuel by way of a pipe 4 having a control valve 5, the latter being opened and closed through a mechanism 6 which will be hereinafter more fully described.

Any type of ignition means, such as a pilot burner, may be provided for lighting the burner 3 and forms no part of the present invention.

The compressors 1 and 2 each include an outer shell or housing 7 of substantially spherical shape provided with a heat outlet pipe 8 at its upper side and its lower or opposite side is provided with a flame chamber 9. The chamber 9 of the

compressor 1 is disposed above and in close proximity to the burner 3.

Refrigerant chambers 10 of spherical shape are located in and spaced from the housings 7 of the compressors 1 and 2. The chambers 10 are of sectional formation and are divided by diaphragms 11 each of cup-shape capable of moving from the lower portions of the chambers to the upper portions. The chambers 10 of the compressors 1 and 2 have connected thereto pipes 12 and 13 which extend through the housings 7 and are connected to check valves 14 and 15, said valves 14 and 15 being connected to evaporators and condensers of refrigeration systems (not shown). The valves 14 operate in an opposite direction to the valves 15 and the pipes 12 and 13 communicate with the chambers at the upper or top walls thereof.

Located in the lower portions of the chambers 10 is a liquid capable of being vaporized to create pressure for driving the diaphragms from their lowermost position to their uppermost position in the chambers 10.

Located in the flame chamber 9 of the compressor 1 is a fluid coil 17 disposed directly above the burner 3 and is connected to the interior of the chamber 10, as shown at 18, and also connected to a pipe 19 communicative with a sump 20 forming a part of the chamber 10 of the compressor 2 and in communication with the lower portion of said last-named chamber. A check valve 17' is located in the pipe 19 and opens in the direction of the coil 17. A float control valve 21 operates in the sump for regulating the flow of liquid or fluid from the chamber 10 of the compressor 2 to the pipe 19. When the sump contains a certain amount of liquid the valve 21 opens admitting the liquid to the coil 17.

In communication with the lower portions of the chambers 10 of the compressors 1 and 2 are pipes 22 connected to the mechanism 6 which includes a housing 23 having therein a diaphragm 24 connected with a valve 25 operating in conjunction with a valve seat 26, the latter and the valve 25 acting to open and close the pipes 22 to one another. A stem 27 is connected to the valve 25 and to the valve 5. The diaphragm 24 works against the tension of a spring 28 in one direction and said spring may have its tension varied through the manipulation of an adjusting medium 29 carried by the housing 23.

In operation, the tension on the valve 25 is adjusted to withstand a predetermined pressure, which pressure is sufficient to move the dia-

phragm 11 of the compressor 1 from the lower portion of the chamber 10 to the upper portion of the chamber 10. The pressure is developed from the heat from the burning fuel of the burner 3, vaporizing the liquid in the lower portion of the chamber 10 of the compressor 1, the chamber 10 of the compressor 1 having been filled with refrigerant from the evaporator of its respective system so that the refrigerant will be forced to the condenser of said system during the movement of the diaphragm 11 from its lowermost position to its uppermost position. As the diaphragm of the condenser 1 reaches its uppermost position to expel substantially all of the refrigerant therefrom, the pressure is sufficient to unseat the valve 25 admitting said pressure to the lower portion of the chamber 10 of the compressor 2 acting to move the diaphragm thereof from its lowermost position to its uppermost position expelling the refrigerant therefrom to the condenser of the other refrigerant system. As the valve 25 unseats it closes the valve 5 discontinuing the supply of gaseous fuel to the burner 3, consequently relieving the compressor 1 of heat and which will permit the liquid to condense and return to the coil 17. The vaporized liquid in the compressor 2 also condenses and passes to the sump 20 and thence to the coil when sufficient liquid has accumulated in said sump to unseat the valve 21.

Connected to the stem 27 of the valve 25 is a thermostat 25' lying in the path of the vapor passing from the compressor 1 to the compressor 2, said vapor being substantially at steam temperature. The thermostat when expanded by the vapor holds the valve 25 disengaged from its seat to permit compressor 1 to exhaust the vapor therein to the compressor 2 before the valve 25 closes under the action of the spring 28. The diaphragm 24 besides being moved in one direction by the spring 28 to seat the valve 25, is also under condenser pressure of either of the refrigerating systems, the connection being made by the pipe 26' so that varying pressure of the condenser will be taken care of.

While I have specifically described companion compressors for operating companion refrigerant systems it is to be understood that the compressor

1 may be employed by itself or minus of the compressor 2, as shown in Figure 2.

Further, it is to be understood that only a single refrigerant system is used when the compressor 1 is employed by itself. Any suitable type of ignition means may be employed for igniting the fuel from the burner.

Having described the invention, I claim:

1. A refrigeration compressor comprising a housing, a refrigerant chamber arranged in said housing and forming therein a heat chamber, a controlled heating means for said heat chamber, a liquid in said chamber to be vaporized by heat, and means mounted in said chamber for separating the liquid from the refrigerant and movable to admit and expel the refrigerant from said chamber by the vaporization and condensing of said liquid.

2. A refrigeration compressor comprising a housing, a refrigerant chamber arranged in said housing and forming therein a heat chamber, a controlled heating means for said heat chamber, a liquid in said chamber to be vaporized by heat, a cup-shaped diaphragm mounted in the chamber to separate the liquid from the refrigerant and movable from one side of said chamber to an opposite side by the condensing and evaporation of the liquid to admit and expel the refrigerant from said chamber.

3. A device of the character set forth comprising multiple heat actuated compressors each including a housing, a refrigerant chamber in the housing, a diaphragm in the chamber, a heating means for one of said chambers, a control valve for said heating means, a coil connected to said chambers and located adjacent the heating means, liquid in the chambers and separated from the refrigerants in the chambers by the diaphragms and in said coil and adapted to be vaporized by heat to form pressure for effecting movement of the diaphragm to expel refrigerant from the chambers, pipes connected to the chambers, and a valve mechanism for exhausting the pressure from one chamber after the actuation of the diaphragm thereof to the other chamber for the actuation of the diaphragm of said last-named chamber and connected to the valve of the heating means.

EARL F. HOLYFIELD.