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REFRIGERATING APPARATUS

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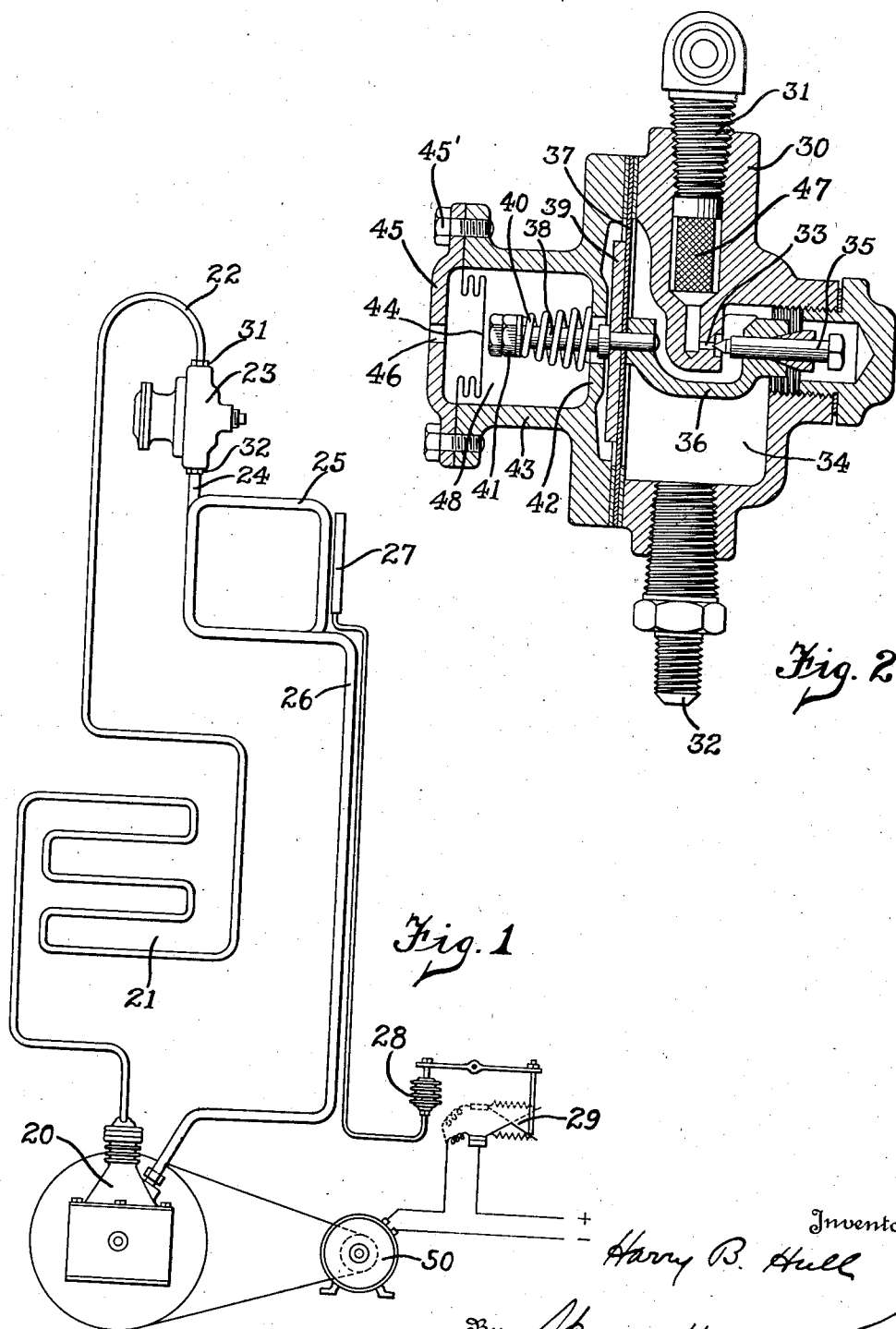


Fig. 1

Fig. 2

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REFRIGERATING APPARATUS

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This invention relates to a refrigerating system in which there is a refrigerating circuit having portions operating under different refrigerant pressures. A portion of the circuit is maintained at a definite pressure differential with respect to the atmosphere, and the other portions of the circuit may operate under a pressure determined by the operation of the pumping mechanism, which pressure may be different from the first-mentioned pressure.

The invention also relates to a method of operating a refrigerating system by means of atmospheric pressure without causing condensation of atmospheric humidity on certain parts of the system.

An object of this invention is to provide a refrigerating system of the character hereinbefore described having a pressure regulating means which is not affected by the humidity of the atmosphere, and on which the condensation of said humidity will not affect the operation of the device.

Another object of this invention is to provide a refrigerating system having an expansion controlling device which may be affected by the pressure of the atmosphere, and which is not affected by the humidity thereof.

Another object of this invention is to provide an expansion valve for a refrigerating system having pressure responsive actuating means affected by the pressure of the atmosphere but not by the humidity thereof.

Another object of this invention is to provide a method of operation of a refrigerating system by means of atmospheric pressure without causing condensation of atmospheric humidity on certain parts of the system.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of embodiment of the present invention is clearly shown.

In the drawings:

Fig. 1 shows diagrammatically a refrigerating system embodying my invention;

Fig. 2 is a cross sectional view of an expansion member embodying my invention.

A refrigerating system according to my

invention may comprise a compressor 20 discharging into a condenser 21 which feeds refrigerant thru a line 22 to an expansion device 23. The expanded refrigerant from the expansion device passes thru a pipe 24 to an evaporator 25 from which the evaporated refrigerant passes thru a pipe 26 back to the compressor 20. The operation of the compressor 20 may be controlled by thermostatic means, such as a thermostatic bulb 27 operating an expansible bellows 28, which operates snap switch 29 for starting and stopping motor 50 of the compressor 20. The expansion means 23 may comprise a casing 30 provided with inlet 31 and outlet 32 for the refrigerant. The inlet 31 may discharge thru an orifice 33 into a chamber 34 which in turn discharges into outlet 32. Orifice 33 may be governed by a needle valve 35 carried by yoke 36 which may be attached to a diaphragm 37 the yoke 36 having attached thereto a member 38 passing thru the diaphragm 37. A disc 39 may be interposed between said member 38 and the diaphragm 37 in order to prolong the life of the diaphragm. Member 38 may carry adjustably a coil spring 40 interposed between an adjusting means such as nuts 41 carried by member 38 and resting on wall 42 of the casing 30. Casing 30 may be provided with an extension 43. The extension 43 may carry a very flexible but impervious diaphragm 44 protected by a cap 45 secured by bolts 45' to the extension 43, said cap 45 having an orifice 46 open to the atmosphere. In order to augment the flexibility of the diaphragm 44, it may be made as a bellows.

It will be seen that refrigerant in inlet 31 and passing thru screen 47 is released in chamber 34 by means of the valve 35. The diaphragm 37 operates the valve 35 in accordance with the pressure difference between the chamber 34 and that of a chamber 48 formed by extension 43. The pressure in chamber 48 may be exactly or substantially that of the atmosphere since the diaphragm 44 is so flexible that the pressure in the chamber 48 is substantially atmospheric. While the diaphragm transmits atmospheric pressure to the chamber 48 it prevents the in-

roduction of the atmospheric humidity near the operating portion of the expansion device and thus prevents the frosting or moistening of the operated parts.

5 The diaphragm shown in the preferred embodiment may be made of various substances, such as rubber or bronze or any other suitable substance which will produce a flexible diaphragm.

10 While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. An expansion valve for a refrigerating system having an actuating member responsive to atmospheric pressure and to the pressure of expanded refrigerant, and means for transmitting atmospheric pressure to said actuating member and for preventing the condensation or frosting of atmospheric moisture on said actuating member.
2. A valve for a refrigerating system including a member operated by a diaphragm responsive to a pressure within the refrigerating system and to atmospheric pressure, and means for transmitting substantial atmospheric pressure to said diaphragm, said last named means preventing the circulation of the surrounding free atmospheric air to said diaphragm.
3. An expansion valve for refrigerating system operated by pressure-responsive means actuated by atmospheric pressure and a pressure within the refrigerating system, and a cover for said pressure responsive means for transmitting atmospheric pressure and for preventing condensation or frosting of atmospheric moisture on said pressure responsive means.
4. An expansion valve for refrigerating system including pressure responsive means actuated on one side by a pressure within the refrigerating system and by atmospheric pressure on the other side, adjusting means connected to said pressure responsive means on the atmospheric pressure side and a flexible cover for said adjusting means for transmitting atmospheric pressure to said pressure responsive means and for preventing the condensation or frosting of atmospheric moisture on said adjusting means.
5. An expansion valve for refrigerating system including a diaphragm, said diaphragm being actuated by pressure within the refrigerating system upon one side and being actuated by atmospheric pressure on the other side, adjusting means on said other side connected to said diaphragm, a housing enclosing said adjusting means and said diaphragm, said housing having an opening to provide access to the adjusting means; and a second flexible diaphragm closing said

opening for preventing the condensation of atmospheric moisture on said adjusting means and for transmitting atmospheric pressure to said first mentioned diaphragm.

In testimony whereof I hereto affix my signature.

HARRY B. HULL.