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COMPRESSOR FOR REFRIGERATING APPARATUS

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Fig. 3.

Fig. 4.

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To all whom it may concern:

Be it known that I, WILLIAM NUSS, a citizen of Germany, and a resident of Hoboken, in the county of Hudson and State of New Jersey, have invented a new and Improved Compressor for Refrigerating Apparatus, of which the following is a full, clear, and exact description.

This invention relates to a compressor for refrigerating systems, and has for an object the provision of a compressor which is simple and efficient in operation, economical to manufacture, and to a minimum extent liable to break down and require repairing.

The invention is illustrated in the drawings, of which—

Figure 1 is a vertical section taken on the line 1—1 of Fig. 2.

Fig. 2 is a horizontal section taken on the line 2—2 of Fig. 1.

Fig. 3 is a diagrammatic view of a refrigerating system showing the compressor.

Fig. 4 is a detail of the system relating to the evaporating chamber.

The form of the invention shown in the drawings is a preferred form, although it is understood that modifications in the construction and arrangement of the parts and in the character of the materials used may be adopted without departing from the spirit of the invention.

In the preferred form of the invention shown in the drawings, the compressor comprises a fixed bottom plate 1, preferably of metal, and a movable upper plate 2, also preferably of metal. Between these plates there is disposed a flexible, cylindrical shell 3 made of any suitable material which is sufficiently flexible, such as rubber, leather, or similar materials. These plates and the flexible shell form a collapsible casing. This shell is connected to the plates 1 and 2 by any suitable means, such as rings 4. The two plates are normally held apart by means of a plurality of springs, such as 5, disposed therebetween, along the edges and along the outside of the flexible shell 3. A spiral spring 6 is also wound around the shell 3 to reinforce it, especially when it is extended in the position shown in Fig. 1, because within this shell there is contained a body of liquid 7, preferably water. The upper plate 2 is depressed by the action of a plunger plate 8. This plunger plate is actuated by a suitable system of linkage, represented by the numeral 9, and driven through gearing 10 from a motor 11. This motor 11 is connected by suitable wires 12 and 13 leading to a source of power, in one of said wires, such as 13, switch contacts 14 and 15 are disposed. One of these contacts is mounted on a plunger 8 and the other on a movable plate 2, so that the circuit is closed when these two contacts are together but open when the contacts are separated.

Within the liquid chamber formed between the plates 1 and 2 and the shell 3, I dispose a refrigerant chamber. This is formed by plates 16 and 17, preferably corrugated and along their outer edges closed by a ring 18 riveted to the plates. On the end face of the lower plate 16 are openings 19 and 20, and to these openings pipes 21 and 22 are connected. In the pipe 21, which happens to be an inlet pipe, a valve 23 is disposed. In the pipe 22, which happens to be an outlet pipe, a valve 24 is disposed. This valve 24 is a discharge control valve. The pipes 21 and 22, respectively, inlet and outlet pipes, from the compressor or refrigerant chamber, are connected to a system of refrigeration. The pipe 23 leads through a condensing coil 25 and thence to an evaporating chamber 26. This chamber 26 is provided with a valve casing 27 in which a floating valve 28 is disposed. A passageway 29 connects the valve casing with the evaporating chamber 26, and as the condensing liquid or refrigerant escapes from pipe 22 into the chamber 26 through the passageway 29, it expands, and by reason of this expansion changes into gas. This expansion, absorption, heat forming and surrounding medium, which may be a liquid 30, such as a brine solution, is disposed in a tank 31 and circulates through a pipe system 32 connected in desired points and returning to the tank 31 in the usual manner. The flow of liquid from the pipe 22 is controlled by the position of the floating valve 28, which may be of any suitable type.

In the operation of the device, therefore, the expansion of the shell 3 will release pressure from the liquid or water 7 within the shell. A compression or movement of the plates 1 and 2 toward each other will create pressure on the liquid 7 and this will, in turn, exert a pressure on the plates 16 and 17 containing the refrigerant. This will be put under pressure and discharge through the valve 24 into the pipe 22. On
the opposite stroke, or expansion stroke, the refrigerant (in the pipe 21, which is the inlet pipe), since it is in the form of a gas, will readily flow in through the valve 23 between the plates 16 and 17. As the refrigerant is cooled more and more, a point will be reached when its pressure will be insufficient to cause the movement of the parts and permit the plate 2 naturally to expand the shell 3. But this lack of pressure at low temperatures is taken care of by the provision of the springs 5 which tend to restrict the upward movement of the plate 2 so that when the pressure of the refrigerant is below a certain value, the plate 2 and the plunger 8 are not normally in contact. However, as the expansive pressure increases, the shell expands not only against the atmospheric pressure but against the position of the springs 5 and forces the plate 2 against the plunger 8, closing the contacts 14 and 15 and permitting the motor to start again.

It will therefore be observed that this refrigerator is a simple, compact device composed of a very few parts capable of standing considerable wear before having to be replaced. The pressures and conditions under which the motor will be automatically cut off and then started again by the switch contacts 14 and 15, can be regulated by varying the tension of the springs 5, as will be apparent from a consideration of the operation above described.

What I claim is:—

1. A refrigerating compressor, which includes a liquid-containing casing having collapsible walls, a flexible walled casing within the first-mentioned casing, said flexible walled casing containing refrigerant, and means for collapsing the first casing to create a variation in pressure therewithin to affect the flexible walled casing.

2. A refrigerating compressor which comprises a pair of plates, a flexible shell between said plates forming a chamber, means for moving said plates relatively to each other, a liquid between said plates in which varying pressure is created by said relative movement, a flexible walled refrigerant chamber within the first-mentioned chamber, and inlet and exhaust connections to said refrigerant chamber.

3. A refrigerating device which includes a pair of spaced plates one of which is fixed, means for moving the other plate, a motor for actuating said means, a flexible shell disposed between said plates and connected thereto to form a chamber, a liquid within said chamber, a flexible walled refrigerant chamber within said first-mentioned chamber, inlet and outlet connections to said refrigerant chamber, springs disposed between said plates to hold them normally a definite distance apart, and circuit switch members mounted on the movable plate and on the means for actuating said plates, said circuit switch connections adapted to be connected when the plunger and the movable plates are brought together.

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