Feb. 14, 1939. J. KARMAZIN 2,146,823

REFRIGERATING APPARATUS AND METHOD OF MAKING SAME

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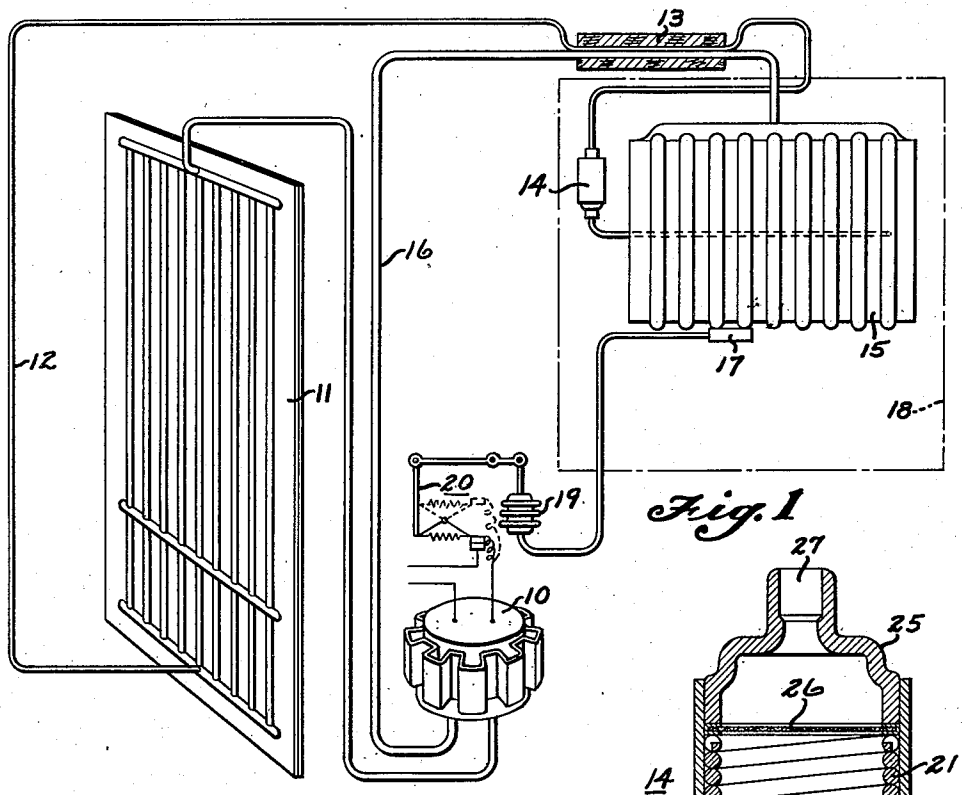

Fig. 1

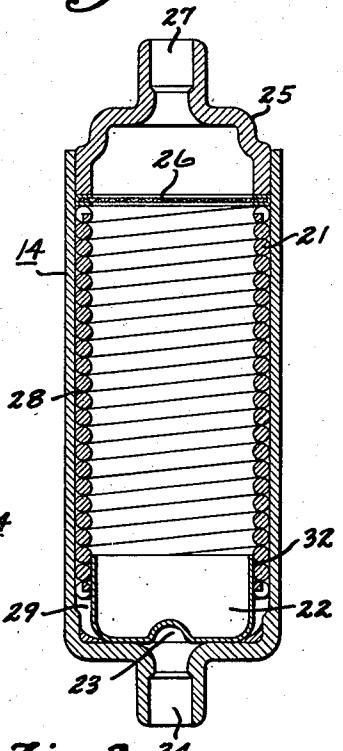

Fig. 2

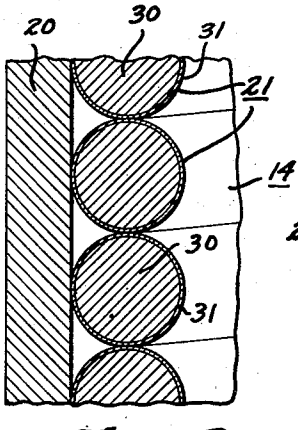

Fig. 3

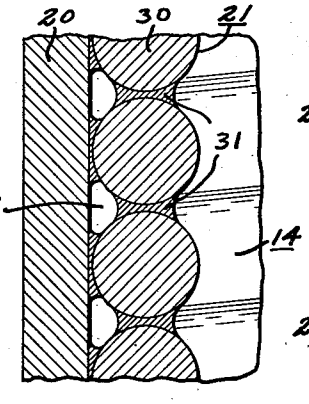

Fig. 4

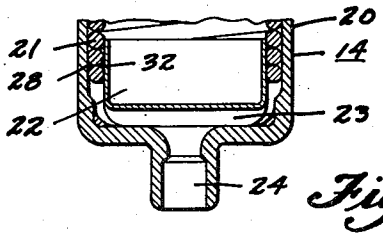

Fig. 5

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REFRIGERATING APPARATUS AND METHOD OF MAKING SAME

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Application April 30, 1936, Serial No. 77,246

9 Claims. (Cl. 113—112)

This invention relates to refrigeration.

An object of this invention is to provide an improved restrictor for refrigerating apparatus or the like and method of manufacturing same.

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

In the drawing:

Fig. 1 is a diagrammatic representation of a refrigerating apparatus embodying my invention;

Fig. 2 is a cross-section of the restrictor;

Fig. 3 is an enlarged cross-section of a portion of the restrictor during the process of manufacture;

Fig. 4 is an enlarged cross-section of a portion of the restrictor in finished form; and

Fig. 5 is a cross-section of a portion of Fig. 2, taken transversely thereto.

A refrigerating apparatus embodying features of my invention may include, in general, a sealed motor compressor unit 10 discharging compressed refrigerant to a condenser 11, from whence liquid refrigerant may flow through the line 12 and interchanger 13 to the restrictor 14. Here the refrigerant is expanded and is delivered to an evaporator 15 from whence the expanded refrigerant flows through the interchanger 13 and line 16 to the motor compressor unit 10. The electric motor of the compressor unit 10 may be controlled in accordance with refrigerating conditions, such as by a thermostat having a bulb 17 in the space 18 to be refrigerated which actuates a bellows 19 and snap switch 20 which opens and closes the circuit to the motor of the unit 10.

The restrictor 14 may be constructed as indicated in Figs. 2 to 5 inclusive. The restrictor includes an outer cylindrical shell or cup 20 within which a wire is helically coiled. An inner cup or obstruction 22 is placed inside of the wire 21 at any point along the wire. For example, it may be placed at the lower end and may be provided with one or more radial passages 23 leading to the outlet 24 in the bottom of the cup 20. The other end or mouth of the cup 20 may be closed by a cap 25 to which is attached a screen or filter 26. The cap 25 is provided with a refrigerant inlet 27. The wire 21 is hermetically secured to the inner surface of the cylinder 20, and the individual coils of the wire 21 are hermetically sealed to each other, to provide a continuous restricted passageway 28, so that the liquid refrigerant entering through the inlet 27 and passing the filter 26 enters the upper end of the passageway 28 and is discharged into the cavity 29 which is connected with the passageway 23 and outlet 24 from whence the refrigerant is delivered to the evaporator.

The restrictor may be manufactured very economically. The cylindrical shell 20 may be made of steel and the wire 21 may have a steel core 30 and may be coated with bonding material, such as copper 31. The wire is wound inside the shell 20 so that the wire touches the shell 20 all along the circumference, and the individual coils of the spiral touch each other. A small amount of bonding material, such as copper, may also be provided where the cap 25 touches the cylinder 20. The restrictor then is passed through a brazing zone in a reducing atmosphere, such as hydrogen, at a sufficiently high temperature to cause the copper 31 to braze the individual coils of the wire to each other and to the casing 20 as indicated in Fig. 4. At the same time the rim of the cup 22 is sealed to the wire 21, so that refrigerant cannot by-pass the passage 28 along the rim of the cup. This can be conveniently accomplished by providing the rim of the cup 22 with a spiral thread at 32 so that the cup can be threaded into the structure, and the brazing at this point forms a complete seal. It is to be understood that the cup 22 need not be placed at the bottom of the structure but may be stopped anywhere along the wire, so long as it seals the inlet of the passageway 28 from its outlet.

The spacing of the loops of the steel core 30 may be varied, depending on the thickness of the copper coating. I now prefer to make the copper relatively thin so that the loops of the core 30 may be as close to each other as possible.

While the form of embodiment of the 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. A restrictor for a refrigerating system or the like comprising an outer shell having an inlet and an outlet, a looped wire inside said shell having its periphery sealed to the inside of the shell and its individual loops sealed to each other to form a restrictor passageway between said shell and wire, and means for preventing the by-passing of refrigerant around said passageway.

2. A restrictor for a refrigerating system or the like comprising a cylindrical shell having an inlet and an outlet, a wire helically wound inside said shell and having its individual loops sealed to the inner surface of said cylindrical

shell and said loops to each other, and means for preventing by-passing of refrigerant.

3. The method of manufacturing a restrictor which comprises placing a steel wire in looped form inside of a steel shell, and bonding said wire to the inner surface of said shell and the individual loops of said wire to each other with a relatively small amount of copper in a reducing atmosphere to cause the formation of a spiral passageway between the looped wire and the inside of said shell.

4. A restrictor for a refrigerating system or the like comprising an outer shell having an inlet and an outlet, a looped wire inside said shell having its periphery sealed to the inside of the shell and its individual loops sealed to each other to form a restrictor passageway between said shell and wire, and an obstruction to prevent by-passing of refrigerant around said passageway.

5. The method of manufacturing a restrictor which comprises placing a steel wire in looped form adjacent a cylindrical surface of a cylindrical steel shell, and bonding said wire to the surface of said shell and the individual loops of said wire to each other with a relatively small amount of copper in a reducing atmosphere to cause the formation of a spiral passageway between the looped wire and the surface of said shell.

6. The method of manufacturing a restrictor which comprises placing a copper coated steel wire in looped form adjacent a cylindrical surface of a steel cylindrical shell, and placing said restrictor in a brazing zone having a reducing atmosphere and a temperature sufficiently high to braze said wire to said shell and the loops of said wire to each other and to cause the formation of a spiral passageway between said wire and shell.

7. A restrictor comprising a cylindrical cup, a wire in looped form in said cup bonded to the interior of said cup and the loops of said wire bonded to each other, the bottom of said cup having a refrigerant passageway, and a cap on the mouth of said cup having a refrigerant passageway.

8. A restrictor comprising a cylindrical cup, a wire in looped form in said cup bonded to the interior of said cup and the loops of said wire bonded to each other, the bottom of said cup having a refrigerant passageway, an obstruction inside said looped wire, and a cap on the mouth of said cup having a refrigerant passageway.

9. A restrictor for a refrigerating system or the like comprising a cylindrical shell, a wire helically wound adjacent a cylindrical surface of said shell and having its individual loops sealed to said surface and said loops to each other, with a spiral passageway between said loops and said surface for the passage of fluid in restricted quantities, said passageway having an outlet and an inlet for the flow of said fluid.

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