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REFRIGERATING APPARATUS

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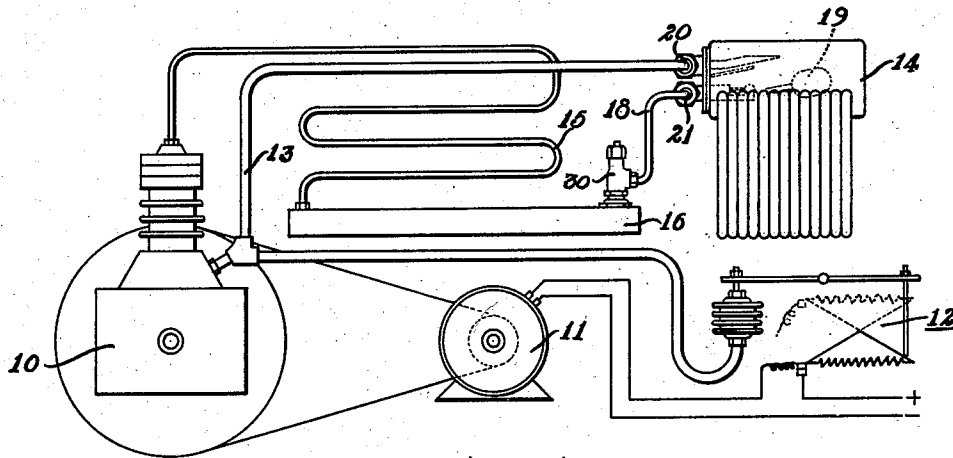


Fig. 1.

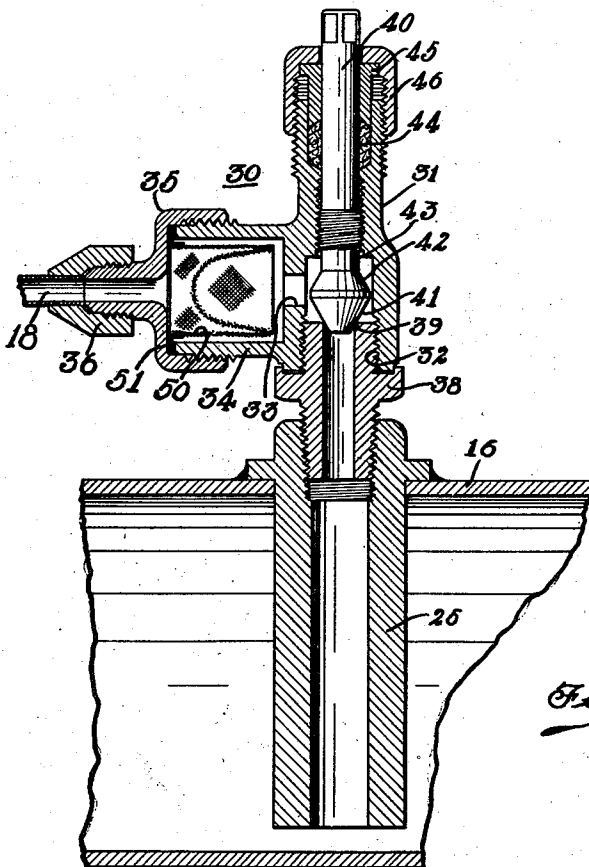


Fig. 2.

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REFRIGERATING APPARATUS

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This invention relates to refrigerating apparatus and particularly to reservoirs or receivers for storing liquid refrigerants in refrigerating systems.

One of the objects of the invention is to provide an improved receiver having a simple and economical fitting for conducting liquid to the rest of the apparatus and for closing communication between different parts of the system.

Another object of the invention is to provide an improved means for filtering refrigerant passing through the system.

Still another object is to provide a filtering fitting in which the filtering element is readily removable for cleaning with a minimum disturbance of the rest of the apparatus.

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 drawings:

Fig. 1 is a diagrammatic representation of a refrigerating system in which my invention is used, and

Fig. 2 is a vertical section of a portion of the receiver.

The refrigerating system illustrated in the drawings comprises a compressor 10 actuated in response to refrigerating demand by a motor 11 under the control of a switch 12 for withdrawing gaseous refrigerant through a conduit 13 from a refrigerating element 14, compressing the refrigerant and delivering it to a condenser 15 where it is liquefied and from which it flows to a tank or receiver 16. Liquid refrigerant under pressure flows to the refrigerating element 14 through a conduit 18 under the control of any suitable means such as a float valve 19 in the refrigerating element. The conduits 13 and 18 are connected to the refrigerating element 14 by shut off valves 20 and 21.

The receiver includes a tube 25, extending nearly to its bottom, through which liquid refrigerant flows under the influence of the pressure maintained within the receiver.

The liquid conduit 18 is connected to the tube 25 through the fitting 30.

The fitting 30 includes a valve housing or casing 31 provided with an inlet opening 32 and an outlet opening 33. Surrounding the outlet opening and formed integral with the casing 31 is a filtering chamber 34, threaded on its exterior surface to receive a connection 35 which in turn receives a flare nut, other suitable device 36 for attaching the end of the conduit 18 to the valve casing. The inlet opening 32 is threaded to receive a nipple 38, which is preferably soldered or sweated to the casing 31. The nipple is threaded at its outer end for attachment to the tube 25 and at its inner end is formed with a valve seat 39. A valve stem 40 is threaded in the valve casing, and carries a valve 41 adapted to engage the seat 39 to close communication between the receiver and conduit 18. The valve stem also carries a valve 42 for engaging a seat 43 when the valve 41 is open, to prevent leakage around the stem 40. The stem is also packed with suitable lubricating or impregnated packing 44, held in place by a gland 45 and a nut or cap 46. A filtering element within the filtering chamber includes a sleeve 50, which may be either cylindrical or frusto-conical, and which may, if desired, be of filtering material such as wire cloth. The sleeve is held in place by a flange 51, integral with or secured to the sleeve, the flange being clamped between the connection 35 and the end of the wall of the filtering chamber. The end of the sleeve near the outlet opening 33 is closed by a cup-shaped screen 53, such as wire cloth, supported by and within the sleeve, as by soldering the edges of the cup and sleeve together, with its open end toward the outlet 33.

It is to be understood that liquid under comparatively high pressure within the receiver flows upwardly through tube 25 and out through opening 33. The cup-shaped filtering element is supported with its open end toward the outlet opening so that it is placed in tension by the pressure of liquid flowing through the filtering chamber. Thus as the screen collects deposits of solid matter,

there is no tendency to crush the cup element, due to the pressure of the liquid being filtered. This arrangement provides a very efficient and sturdy filtering element which can be readily removed for cleaning or replacement from the exterior of the fitting, simply by removing the connection 35. It will be understood that when the filtering element is removed, the valve 41 and the shut off valve 21 are closed, thus isolating the conduit 18 and preventing the loss of refrigerant from the system or the admission of air to the system.

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 that follow.

What is claimed is as follows:

1. In a refrigerating apparatus having a refrigerant conduit and a reservoir for liquid refrigerant, a fitting for connecting the reservoir to the conduit comprising the combination of a valve casing having inlet and outlet openings, a filtering chamber formed integral with the casing on the discharge side of the outlet opening, a valve within the casing for closing communication between the openings, a connection threaded on the wall of the chamber for attaching the refrigerant conduit, and a filtering element in the chamber including a sleeve having a flange clamped between the connection and the wall of the chamber and a cup-shaped screen supported by and within the sleeve with its open end toward said outlet opening.

2. In a refrigerating apparatus having a refrigerant conduit and a reservoir for liquid refrigerant, a fitting for connecting the reservoir to the conduit comprising the combination of a valve casing having inlet and outlet openings, a filtering chamber formed integral with the casing on the discharge side of the outlet opening, a valve within the casing for closing communication between the openings, a connection threaded on the wall of the chamber for attaching the refrigerant conduit, and a filtering element in the chamber including a cylindrical screen having a flange clamped between the connection and the wall of the chamber, and a cup-shaped screen supported by and within the cylindrical screen with its open end toward the outlet opening.

3. In a refrigerating apparatus having a refrigerant conduit and a reservoir for liquid refrigerant, a fitting for connecting the reservoir to the conduit comprising in combination a casing including a valve chamber, a cylindrical boss integrally formed with the casing and including a filtering chamber, said casing having a passage between said chambers, a valve stem in said member having an enlarged head disposed within the valve chamber, a conduit connection threaded to said member and projecting into said valve cham-

ber, a valve seat formed on said connection and adapted to cooperate with said head, a second conduit connection having a flange threaded to the outside of the wall of the filtering chamber, and a filtering element within said chamber including a cylindrical screen having a flange clamped between said second conduit connection and the wall of the filtering chamber and a cup-shaped screen supported by and within the cylindrical screen with its open end toward said passage.

4. In a refrigerating apparatus having a refrigerant conduit and a reservoir for liquid refrigerant, a fitting for connecting the reservoir to the conduit comprising the combination of a valve casing having inlet and outlet openings, a filtering chamber secured to the casing on the discharge side of the outlet opening, a valve within the casing for closing communication between the openings, a connection threaded on the wall of the chamber for attaching the refrigerant conduit, and a filtering element in the chamber including a sleeve having a flange clamped between the connection and the wall of the chamber and a cup-shaped screen supported by and within the sleeve with its open end toward said outlet opening.

In testimony whereof I hereunto affix my signature.

OTTO M. SUMMERS.