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VALVED FITTING FOR REFRIGERATING APPARATUS

Filed Jan. 31, 1927

Fig. 1

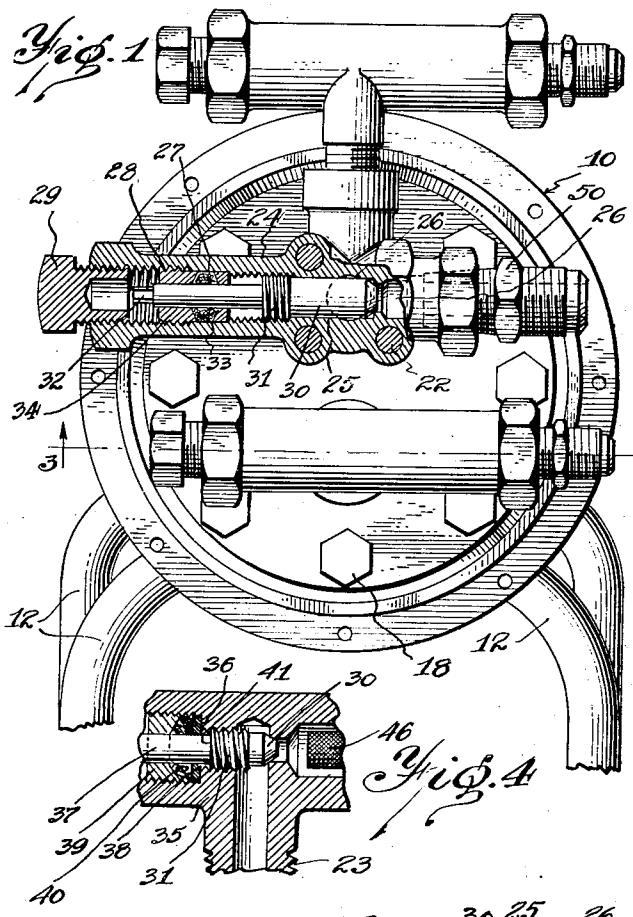


Fig. 2

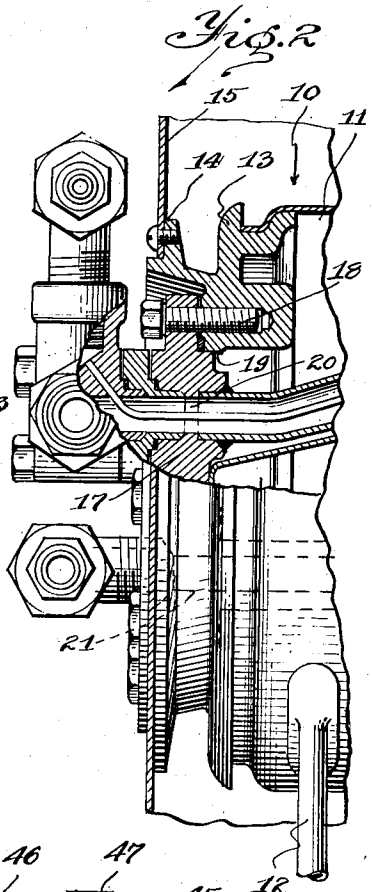
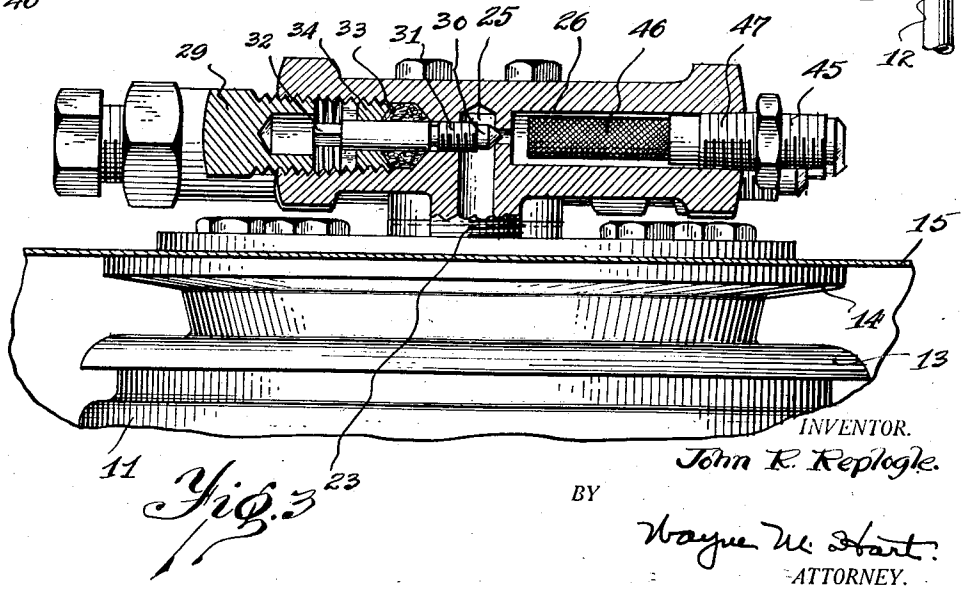


Fig. 4

Fig. 3



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VALVED FITTING FOR REFRIGERATING APPARATUS.

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This invention relates to valved fittings for refrigerating apparatus and particularly pertains to fittings providing connections between the refrigerant lines and the evaporator.

An object of this invention is to provide fittings intermediate refrigerant lines and an evaporator in a refrigerating apparatus which can be readily associated with and removed from such elements thereby facilitating manufacture and serviceing.

Another object of the invention is to provide a fitting, for connecting the refrigerant lines with an evaporator in a refrigerating apparatus, which is constructed and arranged to permit a valve structure to be enclosed entirely therein to eliminate leakage of refrigerant therefrom.

Another object of the invention is to provide a fitting, for connecting a refrigerant line with an evaporator of a refrigerating apparatus, which is provided interiorly with a removable strainer serving to filter the refrigerant prior to its admittance into the evaporator and capable of enduring extensive use without cleaning.

These and other objects will be apparent as the description progresses, the accompanying drawing illustrating a preferred embodiment of the invention.

In the drawings:

Fig. 1 is a front elevational view of an evaporator showing the valved fittings assembled therewith, a part of one of the fittings broken away to show the interior structure.

Fig. 2 is side elevation thereof partly broken away to show some of the interior structure.

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1.

Fig. 4 is a detail sectional view showing a modified form of valve structure.

The purpose of this invention is to provide a fitting for connecting an evaporator 10 with the refrigerant lines of the refrigerating apparatus. The illustration shows an evaporator used in conjunction with the flooded type of refrigerating apparatus. This evaporator consists of a header 11 and depending pipe loops 12. A ringlike end member 13 is secured to the end of the header and is provided with the flange 14 which is bolted or otherwise secured to the wall of the brine tank 15. The closure plate 17 is secured to the ringlike end plate 13 by means of the bolts 18 for closing the opening 19 in the plate 13, said opening being large enough to permit the insertion and removal of the valve mechanism (not shown) which maintains the level of the refrigerant in the evaporator constant. This plate 17 is provided with the refrigerant outlet port 20 and the refrigerant inlet port 21.

The refrigerant feed line must be connected to the inlet port 21 and the return suction line connected to the outlet port 20. It is very important that these connections should not leak, and to prevent any chance of leakage I provide fittings, which are secured to the plate 17 in any suitable manner. These fittings are preferably secured to the plate 17 by the bolts 22, or they may be externally threaded, as at 23, (Figs. 3 and 4) and screwed directly into the plate.

These fittings are substantially identical for each connection, and a description of one of the fittings will be sufficient for a clear understanding of the invention. Each fitting comprises a valve casing 24 provided with a valve chamber 25 and with a passageway 26, the passageway of one of the fittings serving as an inlet and the passageway of the other serving as an outlet, said passageway communicating with the valve chamber 25. In line with the passageway, the casing is provided with a bore which communicates with the valve chamber, opening into said valve chamber directly opposite from the mouth of the passageway in line therewith. Adjacent the valve chamber the bore is internally threaded, and beyond, the bore is enlarged, as at 27, and internally threaded, as at 28. This bore is open to the outside of the casing, and is closed by a screw threaded plug 29. The valve structure comprises the valve 30 which is beveled and shaped to seat on the mouth of said passageway for closing the same, and is externally threaded at an intermediate point, as at 31, this threaded portion of the valve structure being arranged to engage the first mentioned threaded portion of the bore. The opposite end of the valve structure from the valve 30 is provided with an angular wrench grip 32, this portion of the valve structure being projected within the enlarged bore 27 of the valve casing so that when the plug 29 is removed a wrench or other suitable tool may be inserted and ap-

plied to the wrench grip for manually adjusting the valve with respect to its seat. The packing 33 and a packing nut 34 are assembled within the enlarged bore for preventing leakage of the refrigerant longitudinally along the valve stem. The assembly of this valve structure within the valve casing may be readily made, as the valve may be inserted and removed through this bore, and when properly adjusted the plug 29 is screwed in thus sealing the valve structure within the casing and entirely enclosing the same. The mouth of the outlet passageway is shown closed in Fig. 1, and the mouth of the inlet passageway is shown closed in Fig. 3.

In Fig. 4 there is shown a modified form of valve assembly in which the casing 35 is provided with the abrupt shoulder 36. The valve stem is of slightly different structure, and comprises a portion 37 reduced in diameter and extending within the enlarged bore. A washer 38 is inserted within this bore and abuts the abrupt shoulder 36, the central hole through the washer being of less diameter than the externally threaded portion of the valve stem, but of sufficient size to permit the reduced stem portion of the valve to slide therethrough. This washer is backed up by the packing nut 39 and packing 40, and serves to limit the opening movement of the valve as the shoulder 41 formed by the reduced stem portion will strike this washer and prevent any further movement of the valve.

In Fig. 3 the fitting is shown as adapted to connect the refrigerant feed line (not shown) with the evaporator, by means of the union 45. Secured to the inner end of this union is a cup-shaped screen 46 which is enclosed within the passageway 26 which in this case serves as an inlet passageway. The refrigerant must therefore pass through this screen before entering the valve chamber 25, and consequently the refrigerant will be filtered, thus removing any foreign particles from the refrigerant before the same enters the evaporator. This union 45 is externally threaded, as at 47, and is screwed into the end of the fitting. Such a connection permits the ready removal of the screen for the purpose of replacing or cleaning the same. The relatively large area of screen effective for filtering the refrigerant requires less frequent removal and cleaning of the screen. With the valve structure as above described, the same may be manually turned down to close the opening between the inlet passageway and the valve chamber before disconnecting the refrigerant feed line when removing the screen. Similarly, the connection of the fitting to the return suction line may be removed after turning the valve down on its seat. Fig. 1 shows the construction of the valve which is used as a connection between the evaporator and the return suction line, and with such a fitting it is not necessary to have a screen. In this case the union 50, which connects the fitting with the return suction line, is not provided with a screen.

This improved fitting, as described above, may be readily secured to the evaporator, the refrigerant lines being connected directly to the fittings. Whenever any of the refrigerant lines are disconnected the valve must be closed so as to trap the refrigerant within the evaporator to prevent any escape of the refrigerant. The construction and assembly of the valve within the fitting is such that ready access may be had thereto for the purpose of making adjustments or for removing the valve if necessary.

What I claim is:

1. A fitting for connecting an evaporator into the refrigerant circuit of a refrigerating system, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways communicating with said valve chamber, and a valve structure entirely enclosed within said valve casing for opening or closing one of said passageways.

2. A fitting for connecting an evaporator into the refrigerant circuit of a refrigerating system, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways communicating with said valve chamber, and a manually adjustable valve structure entirely enclosed within said valve casing for opening or closing one of said passageways.

3. A fitting for connecting an evaporator into the refrigerant circuit of a refrigerating system, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways communicating with said valve chamber, an adjustable valve structure in said chamber entirely enclosed by said casing for opening and closing one of said passageways, said casing being provided with an opening in the wall thereof through which said valve may be inserted and removed, and a closure member for said opening and which is removably secured to said casing.

4. A fitting for connecting an evaporator into the refrigerant circuit of a refrigerating system, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways communicating with said valve chamber, a valve structure supported within said chamber and entirely enclosed by said valve casing, said valve structure having a screw threaded engagement with said valve casing to permit the manual adjustment of said valve, said casing provided with an opening in the wall thereof through which said valve may be inserted and removed and through which access may be had to said valve for adjust-

ing the same, and a closure member for said opening removably secured to said casing.

5. A fitting for connecting the refrigerant lines to an evaporator of a refrigerating apparatus, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways communicating with said said valve chamber, a valve supported within said chamber and enclosed by said valve casing, said valve having a screw threaded engagement with said valve casing to permit the manual adjustment of said valve, and means for limiting the opening movement of said valve.

6. A fitting for connecting the refrigerant lines to an evaporator of a refrigerating apparatus, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways communicating with said valve chamber, said casing provided with a bore communicating with said valve chamber, the inner portion of said bore being internally threaded and the outer portion being enlarged and internally threaded, a plug screwed into the enlarged threaded portion to close the outer end of the bore, a valve structure including a valve stem being externally threaded to engage the inner threaded portion of the bore, the outer end portion of said stem being reduced in diameter and projected within the enlarged portion of the bore, a washer fitted within the enlarged bore and abutting the shoulder formed at the base of the enlarged bore, a packing nut and packing member bearing against said washer, the end of said valve stem extending beyond said packing nut being adapted to be engaged for adjustment, the shoulder formed by the reduced outer portion of the stem being arranged to engage said washer to limit the outward movement of said valve, said plug being removable to permit access to the end of said valve stem for manual adjustment.

7. A fitting for connecting the refrigerant lines to an evaporator of a refrigerating apparatus, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways communicating with said valve chamber, a valve within said casing for opening or closing one of said passageways, and a cup-shaped filtering element having a relative large area of filtering surface and removably secured within said casing for filtering the refrigerant prior to its entrance into the evaporator.

8. A fitting for connecting the refrigerant lines to an evaporator of a refrigerating apparatus, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways communicating with said valve chamber, a valve within said casing for opening or closing one of said passageways, and a cup-shaped filtering screen having a relatively large area of filtering surface and removably supported within said inlet passageway.

9. A fitting for connecting the refrigerant lines to an evaporator of a refrigerating apparatus, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways, and a valve structure enclosed within said valve casing for opening or closing one of said passageways, said casing being constructed to permit the securing of connections thereto communicating with said inlet and outlet passageways, one of said connections being arranged to be secured to the evaporator and the other connection being arranged to be secured to one of the refrigerant lines.

10. A fitting for connecting the refrigerant lines to an evaporator of a refrigerating apparatus, comprising a valve casing provided with a valve chamber and with inlet and outlet passageways communicating with said valve chamber, a valve within said casing for opening or closing one of said passageways, a union secured to said casing at the mouth of one of said passageways to which one of the refrigerant lines may be attached, and a filtering screen associated with the inner end of said union, said screen and union being removable from the casing.

In testimony whereof, I hereunto affix my signature.

JOHN R. REPLOGLE.