

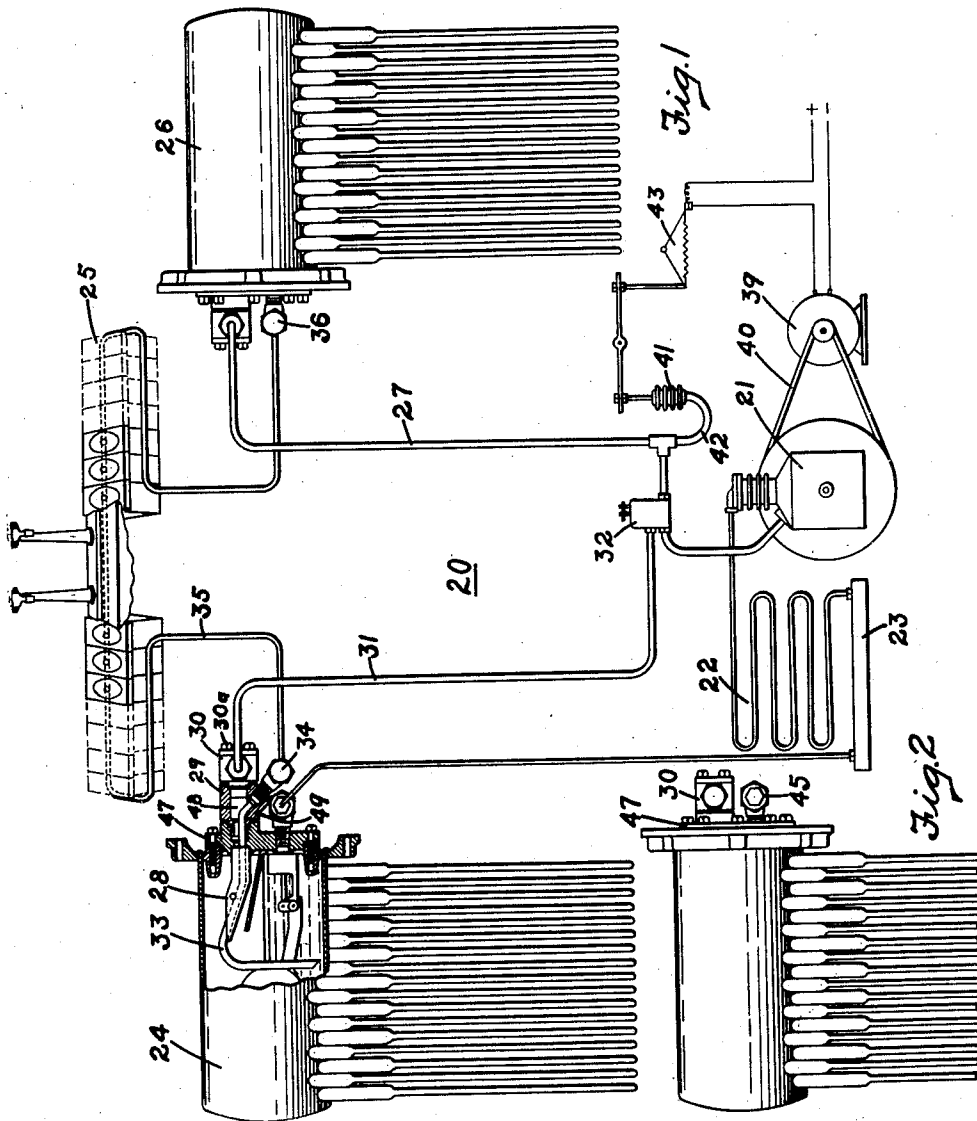
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REFRIGERATING APPARATUS

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UNITED STATES PATENT OFFICE

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REFRIGERATING APPARATUS

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This invention relates to refrigerating apparatus and more particularly to an apparatus for installation in what is commonly called an ice cream counter.

5 An object of this invention is to provide a fitting for adapting a standard evaporator so that it may be used in a system where several temperatures are to be obtained.

10 Another object of this invention is to provide an evaporator or cooling unit with a fitting adapting it to be used with systems for furnishing several different temperatures, for instance, in an ice cream cabinet.

15 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.

20 In the drawings:

Fig. 1 is a view partly in elevation, partly in section and partly diagrammatic of a refrigerating system embodying my invention, and

25 Fig. 2 is a view in elevation of one type of standard evaporator adapted to be changed for use in said system.

A refrigerating system embodying features of my invention is generally designated as 20. It may comprise a refrigerant liquefying unit which, in this embodiment, may comprise a compressor 21 delivering compressed refrigerant to a condenser 22. The refrigerant condensed in the condenser 22 is stored in the receiver 23 from which it is delivered as required to an evaporator generally designated as 24. The evaporator 24 is adapted to feed chilled liquid refrigerant to a body to be cooled, in this case shown as a sirup rail 25, from whence liquid refrigerant is delivered to a second evaporator 26. Refrigerant evaporated in evaporator 26 is returned thru the pipe 27 to the compressor 21, for instance, thru the crankcase. A portion of the refrigerant delivered to the evaporator 24 is evaporated therein, and this evaporated refrigerant leaves the evaporator thru the pipe 28, fitting 29, valve 30, pipe 31, and automatic valve 32
50 back to the compressor 21. The valve 32

is an automatic valve adapted to maintain a pressure in evaporator 24 somewhat higher than the pressure in evaporator 26. Thus the evaporator 24 is maintained at a higher temperature and may be used to cool the 55 supplies requiring relatively higher temperatures, such as the water, while the evaporator 26 may be used for the coldest temperatures required, for instance, to cool the brine for maintaining the ice cream in 60 a frozen condition.

The evaporation of the refrigerant in evaporator 24 chills the liquid refrigerant in said evaporator. A part of the chilled liquid refrigerant may be taken thru the 65 pipe 33 and thru the branch 34 to the pipe 35 which may be used to cool the sirup in the various containers of the sirup rail 25. The refrigerant thence passes to the inlet 36 of the evaporator 26 provided with a float 70 controlled valve, not shown, in evaporator 26. The difference in pressure maintained between evaporator 24 and the evaporator 26 by means of the valve 32 causes the flow of liquid refrigerant thru the pipe 35. Thus 75 it is seen that several different temperatures may be maintained in the cabinet, as for instance, the zone cooled by the evaporator 24, the zone cooled by pipe 35 and the zone cooled by the evaporator 26. 80

Means for rendering the operation of the refrigerant liquefying apparatus automatic may be provided. For this purpose a motor 39 may drive the compressor 21 thru some medium such as the belt 40. An expansible 85 bellows 41 may be connected to the pipe 27 by means of the pipe 42. The expansible bellows 41 is adapted to operate a snap switch 43 which controls the starting and stopping of the electric motor 39. In this 90 particular embodiment, the bellows 41 is actuated by the pressure prevailing in the evaporator 26. Since the evaporator 26 is to be maintained at the lowest pressure, the remainder of the system is automatically 95 maintained at its proper pressure because the flow of the refrigerant is in the direction of the lowest pressure, which, in this case, is in the evaporator 26 and the return line 27. 100

In order that a standard evaporator may be used for making this type of installation the fitting 29 is adapted to be placed in the usual evaporated refrigerant outlet of a standard evaporator. In Fig. 2 is shown a type of standard evaporator which may be changed by my improved fitting in order to adapt it to the system herein described. As shown, this evaporator is similar to evaporator 26. It may be provided with a float controlled inlet 45 and an evaporated refrigerant outlet needle valve fitting 30. The inlet and the outlet fittings are adapted to be mounted on a plate 47, which is adapted to receive the inlet and the outlet fittings in the proper openings. In order to adapt this evaporator for the system heretofore described it is only necessary to unscrew the fitting 30 from the plate 47. The fitting 29 may then be placed in the opening left by the fitting 30 and thereafter the regular fitting 30 may be inserted in the fitting 29.

The fitting 29 may be made by providing a passage 48 for the evaporated refrigerant. The fitting may have a shouldered reduced end for insertion into the plate and a shouldered enlarged opening for receiving the fitting 30. The fittings 29 and 30 may be secured to the plate 47 by means of bolts 30^a passing thru both fittings. A branch 49 may be made in said fitting 29. This branch 49 may have a tube 33 soldered thereto so that no evaporated refrigerant may pass out of the branch 49. In placing the fitting 29 on the plate 47, the tube 33 may be first inserted thru the tube 28 and may be bent into the position shown in Fig. 1 after the fitting 29 has been bolted in place as herein before described. Thereafter, the plate 47 may be attached to the evaporator. The end of the tube 33 may be cut at a 45° angle, as shown, in order to insure that the end of the pipe is not closed by the walls of the evaporator. The branch 49 may then have the fitting 34, which may be of the needle valve variety, screwed thereto to which the pipe 35 may be connected.

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. A cooling unit comprising a float chamber, a refrigerant inlet, a float controlled valve in said inlet, an evaporated refrigerant outlet having its terminal above the normal liquid level in said unit, a fitting in said outlet provided with a tube extending below said normal liquid level and with a branch for delivering liquid refrigerant from said tube.

2. A cooling unit comprising a liquid re-

frigerant chamber, an automatically controlled refrigerant inlet in said chamber, an evaporated refrigerant outlet having its terminal above the normal liquid level in said unit, a fitting in said outlet provided with a tube extending below said normal liquid level and with a branch for delivering liquid refrigerant from said tube.

3. A cooling unit comprising a float chamber, a refrigerant inlet, a float controlled valve in said inlet, an evaporated refrigerant outlet having its terminal above the normal liquid level in said unit, a fitting in said outlet provided with an extension below said normal liquid level and with a branch for delivering liquid refrigerant from said extension.

4. A fitting to be placed in the regulation evaporated refrigerant outlet of an evaporator, said fitting being provided with an extension adapted to extend below the normal liquid refrigerant level in said evaporator and being provided with a branch for delivering liquid refrigerant from said extension and with a branch for delivering evaporated refrigerant from said evaporator.

5. A plate for making refrigerant conduit connections with an evaporator said plate being provided with a liquid refrigerant, automatically controlled inlet, an evaporated refrigerant outlet and a fitting adapted to be placed in said evaporated refrigerant outlet, said fitting being provided with an extension passing thru said outlet and adapted to extend below the normal liquid level in said evaporator, and with branches for evaporated refrigerant and chilled liquid refrigerant respectively.

In testimony whereof I hereto affix my signature.

JESSE G. KING.