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S. RUPPRICHT

2,096,065

REFRIGERATING SYSTEM

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2 Sheets-Sheet 1

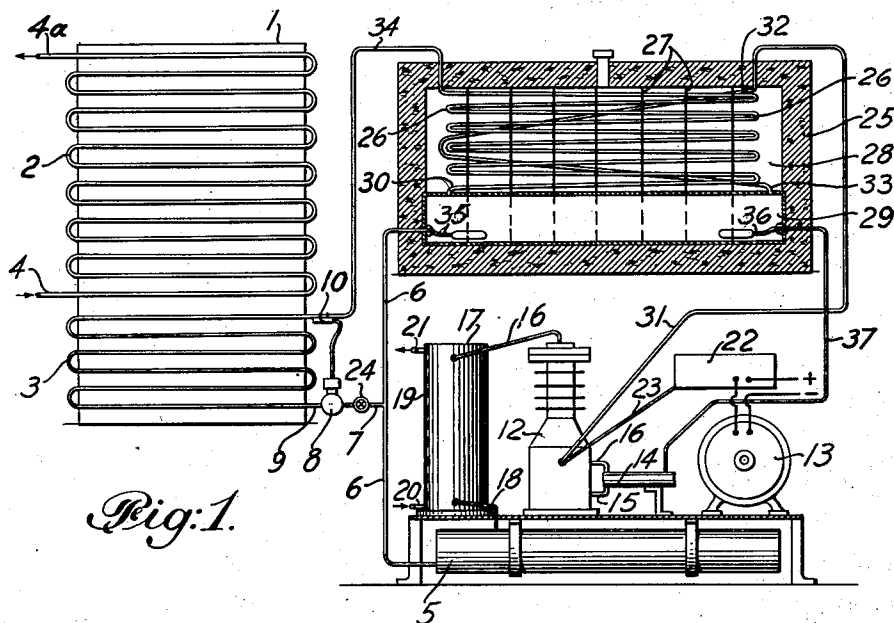
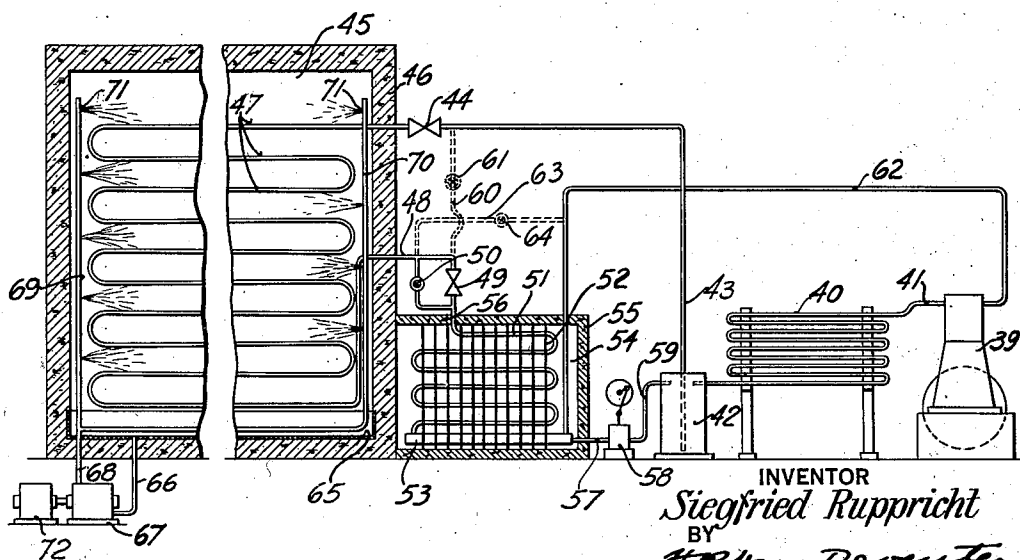


Fig. 1.

Fig. 2.



INVENTOR
Siegfried Ruppricht
BY
A. R. Van Deventer
ATTORNEY

Oct. 19, 1937.

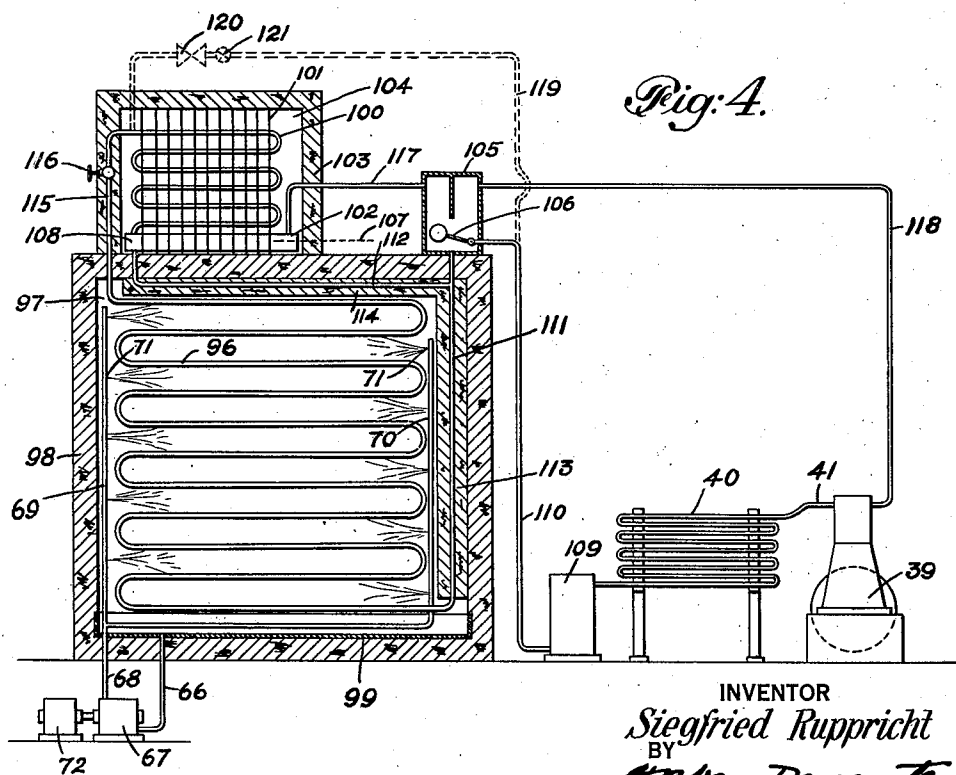
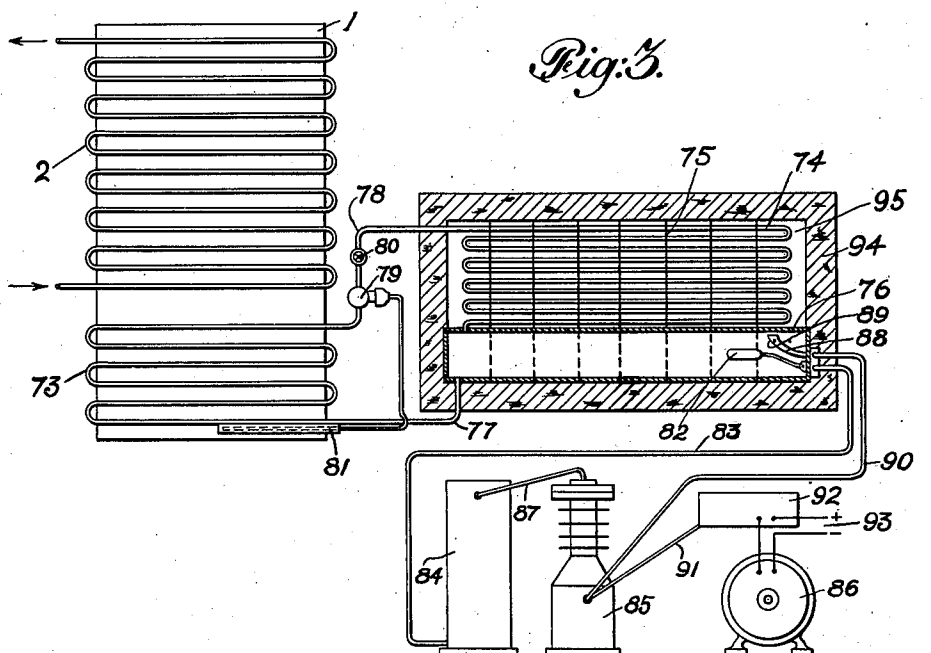
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REFRIGERATING SYSTEM

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2 Sheets-Sheet 2



INVENTOR
Siegfried Ruppricht
BY
H. R. Van Deventer
ATTORNEY

UNITED STATES PATENT OFFICE

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REFRIGERATING SYSTEM

Siegfried Ruppricht, New York, N. Y.

Application March 22, 1933, Serial No. 662,115
In Germany March 23, 1932

19 Claims. (Cl. 62-115)

This invention relates to improvements in refrigerating systems and has for an object the provision in a refrigerating system of apparatus for storing up refrigeration to take care of sudden or peak load demands exceeding the capacity of the compressor used for operating the refrigerating system.

A further object of the invention is the provision in a refrigerating system of a main receiver connected to the condenser of the system, and an auxiliary condenser and receiver positioned between the evaporator and the suction of the compressor and including means in the auxiliary receiver for by-passing liquid refrigerant thereto from the main receiver.

Another object of the invention is the provision in a refrigerating system for the storage of heat in a medium of different character than the medium which carries heat from one part of the system to another.

This is accomplished by providing the high side of the system with an abnormally large receiver and providing an auxiliary condenser and receiver between the evaporator and the suction connection to the compressor. Automatic means is provided in the auxiliary receiver for by-passing liquid refrigerant from the main receiver to supply sufficient refrigeration therein to offset the heat leakage through the insulating walls surrounding the auxiliary condenser and receiver. The system also includes an automatic device for returning oil from the auxiliary receiver to the crank case of the compressor.

For describing and illustrating the invention, one embodiment is shown in connection with a milk cooler and another embodiment is shown in connection with a quick freezing system.

Figure 1 is a diagrammatic sketch showing an embodiment of the invention as applied to a milk cooler;

Figure 2 is a diagrammatic sketch showing a further modification of the invention used in connection with a quick freezing system.

Figure 3 is a diagrammatic sketch of a modification of the system shown in Figure 1 in which the evaporator is of the flooded type; and

Figure 4 is a diagrammatic sketch of a quick freezing system in which the evaporator is flooded and the pump shown in Figure 2 is eliminated.

Referring to Figure 1, an aerator 1 is provided with an upper series of pipes 2 and a lower series of pipes 3. Water enters the series 2 at the lower end 4 and is discharged therefrom at the upper end 4a. The lower series of pipes 3 form the evaporator for a refrigerating system

and the description thereof will be directed to a direct expansion system.

Liquid refrigerant from a receiver 5 passes via the pipe 6 and the branch pipe 7 to a thermostatic expansion valve 8, which is connected to the lower end 9 of the evaporator 3. A thermobulb 10 for controlling the expansion valve 8 is mounted in heat exchange relation to the evaporator 3 at a convenient point.

A compressor 12, driven by a motor 13 by means of a belt and pulley (not shown) is provided with an oil vessel 14 connected to the lower part of the crank case by a conduit 15 and to the upper part of the crank case by a conduit 16 forming an oil reservoir and thereby preventing sudden changes of the oil level in the crank case. The discharge pipe 16 of the compressor is led into a condenser 17 and a pipe 18 from the condenser leads liquid refrigerant into the receiver 5.

The condenser 17 is provided with a jacket wall 19 having a water inlet 20 at the bottom and a water outlet 21 at the top.

The receiver 5 is substantially larger than the usual receiver required for an ordinary system of a given capacity. The compressor 12 is also equipped with a pressure control 22 which is connected to the low side by a pipe 23 and wires connected to the switch thereof lead to the motor and to a source of current. A shutoff valve 24 is provided in the branch pipe 7 ahead of the expansion valve 8.

An insulated container 25 contains an auxiliary condenser 26. This condenser is provided with fins 27 and is immersed in a eutectic fluid 28. An auxiliary receiver 29 is provided in the lower part of the insulated container 25 and the auxiliary condenser is connected to this receiver at the point indicated by the numeral 30. A suction pipe 31 of the compressor is connected to a coil of pipe 32 which is also immersed in the fluid 28 and which is connected to the receiver at the point indicated by the numeral 33. The evaporator 3 is connected to the condenser 26 by a pipe 34.

The receiver 29 is provided with a float valve 35 which is connected to the liquid line 6.

The float valve 35 admits refrigerant to the receiver 29 from the receiver 5 for compensating the heat leakage through the insulation of the container 25.

The receiver 29 is also provided with a float valve 36 which may be positioned higher than the float valve 35 if sulphur dioxide is used or lower than the float valve 35 if refrigerants which

are lighter than oil are used. Assuming that sulphur dioxide is used, the oil floats on top of the refrigerant and the valve 36 placed at a higher level than the valve 35 will allow oil to pass from the receiver 29 via the pipe 37 to the oil reservoir 14, which as explained before communicates with the crank case of the compressor 12.

The milk cooler operates as follows: When current is supplied to the motor and the machine starts up, liquid refrigerant passes from the receiver 5 through the pipe 6 and via the valve 35 to the auxiliary receiver 29, where it evaporates and absorbs heat from its surroundings until most of the heat contained in the insulated container 25 is removed and the eutectic mixture 28 is congealed. The fins 27 extend from the auxiliary receiver 29 throughout the mixture 28 and in contact with the condenser 26 and are provided both for expediting the process just explained and for pre-condensing gaseous refrigerant during the process of cooling the milk.

The container 25 having been reduced in temperature and the eutectic fluid 28 congealed, the pressure in the receiver 14 is greatly reduced and the control 22 acts and stops the motor from operating.

The system is then ready for the milk cooler to operate.

Cold water is passed via the bottom inlet 4 through the coil 2 and out via the outlet 4a. The valve 24 in the liquid line 7 is opened so that the thermostatically controlled expansion valve 1 may operate under control of its thermo-bulb 10.

Milk is allowed to trickle over the pipes of the coil 2 where the temperature is reduced by the cold water flowing therethrough. After leaving the coil 2 the milk trickles over the coil 3 which is the evaporator of the system.

As soon as the valve 24 is opened, as previously described, liquid refrigerant evaporating in the coils 3 reduces the temperature thereof until the thermo-bulb 10 closes the automatic expansion valve 8. When the milk which is warm reaches these coils they are warmed up thereby, and the thermo-bulb allows more refrigerant to pass through into the coil, thereby cooling the milk.

Gaseous refrigerant from the evaporator 3, in seeking the coldest place, passes via the pipe 34 into the auxiliary condenser 26 which with its fins is surrounded by the frozen eutectic fluid 28, as above described. The heat from these gases is given up to the fluid 28 and the refrigerant condenses and passes down via the inlet 30 into the auxiliary receiver 29.

The control 22 is so set that when heat enters the insulated compartment 25 the motor starts and driving the compressor, pulls refrigerant from the auxiliary receiver via the connection 33, the suction coil 32 and the pipe 31, to the inlet of the compressor, and compressed refrigerant leaving the compressor via the pipe 16 enters the condenser 17 where it is liquified and liquid refrigerant passes therefrom via the pipe 13 to the receiver 5.

The system is so proportioned that when the auxiliary condenser has its temperature reduced and the eutectic fluid 28 frozen, practically all of the refrigerant is in the main receiver 5, and when the predetermined quantity of milk has been cooled the majority of the liquid refrigerant is in the auxiliary receiver 29, and only a small quantity in the main receiver 5.

In the quick freezing system, as shown in Fig-

ure 2, a compressor 39, which may be driven by any suitable source of power, is connected to a main condenser 40 by the pipe 41. The condenser 40 is connected to a main receiver 42 which is of sufficient capacity to hold substantially all of the liquid refrigerant in the system.

A liquid line 43 extends from a point near the bottom of the receiver 42 to an expansion valve 44. A quick freezing chamber 45, having insulated walls 46 is provided with an evaporator 47. The upper end of the evaporator 47 is connected to the expansion valve 44 and the lower end is connected by pipe 48 to an expansion valve 49 which is adapted to be by-passed by a valve 50. An auxiliary condenser 51, having a plurality of fins, one of which is designated by the numeral 52, has its lower coil terminating in an auxiliary receiver 53.

The condenser 51, with its fins 52 and the auxiliary receiver 53, is enclosed in a tank containing a eutectic fluid 54 and surrounded by a suitable insulated casing 55. A pipe 56 connects the auxiliary condenser 51 to the expansion valve 49 and to the by-pass valve 50. The outlet 57 of the auxiliary receiver 53 is connected to a liquid pump 58 and the outlet pipe 59 of this pump is led into the main receiver 42. In some installations it may be desirable to connect the expansion valve 49 to the liquid line 43. Such connection is shown dotted at 60, and includes a shut-off valve 61. It may also be desirable to have the suction line 62 connected directly to the evaporator 47, thereby by-passing the auxiliary condenser 51. Such a connection is shown dotted at 63 and includes a shut-off valve 64.

The quick freezing room 45 may be equipped with shelves upon which goods to be frozen may be placed. The floor of the room 45 may consist of a shallow open tank 65 adapted to hold a quantity of brine. This brine is passed via the pipe 66 to the inlet of a pump 67 and the outlet 68 of the pump supplies this brine under pressure to the pipes 69 and 70. These last-named pipes are provided with a plurality of orifices one of which is designated by the numeral 71, through which the brine under pressure is sprayed or atomized into the air in the chamber 45. This fine spray or mist of brine is cooled by the evaporator 47 and comes into contact with the goods on the shelves, absorbing heat therefrom and freezing the same.

Before starting the quick freezing action, the compressor is operated and liquid refrigerant from the receiver 42 via the liquid line 43 and the expansion valve 44 passes into the evaporator 47 and via the pipe 48, and the expansion valve 49 this refrigerant passes into the auxiliary condenser 51, reducing the temperatures of both the fast freezing room 45 and the eutectic fluid 54 surrounding the auxiliary condenser 51. Gaseous refrigerant leaving the auxiliary receiver 53 passes via the suction pipe 62 to the compressor, where it is compressed and passes via the pipe 41 into the condenser, and upon becoming liquefied therein passes into the main receiver 42. This process is continued until the eutectic fluid 54 has become congealed, whereupon the system is ready for the fast freezing process.

The motor 72 is started up and the pump 67 connected thereto begins to pump the brine and spray the same through the orifices 71 in the pipes 69 and 70. The sprayed brine is cooled by the evaporator 47 and the refrigerant therein begins to evaporate. This refrigerant, seeking the coldest place in the system, passes via the pipe 48 and the expansion valve 49 into the auxiliary 75

condenser 51, where it gives its heat up to the eutectic medium 54, liquefies, and flows into the auxiliary receiver 53. The refrigerant compressor 39 is started up and removes from the auxiliary condenser as much gaseous refrigerant as it (the compressor 39) can handle. The remainder of this gaseous refrigerant is condensed in the auxiliary condenser upon giving its heat up to the eutectic fluid. At the same time, the brine pump 67 and the compressor 39 were started the liquid pump 58 was also put into operation and by means of this pump liquid refrigerant is removed from the auxiliary receiver and pumped into the main receiver 42.

After the eutectic fluid 54 has all become melted and its temperature raised, the refrigerant effect of the system is of such capacity as the compressor 39 will normally handle. Therefore, the process of freezing the eutectic fluid 54 in contact with the auxiliary condenser 51 enables the system to take care of extra capacities or peak loads at periodic intervals.

In the milk cooling system shown in Figure 3, the evaporator is operated flooded, instead of dry, as shown in Figure 1. Therefore, the main receiver is not necessary as the auxiliary receiver may be made to serve a double purpose.

The aerator 1 is provided with an upper series of pipes 2 and a lower series of pipes 73, the latter comprising a flooded evaporator. An auxiliary condenser 74 is provided with a plurality of fins, one of which is designated by the numeral 75, and an auxiliary receiver 76. The auxiliary receiver is connected via pipe 77 to the lower coil of the evaporator 73. The upper coil of the evaporator 73 is connected via the pipe 78 to the auxiliary condenser 74, and is provided with a regulating valve 79 and a hand shut-off valve 80. The regulating valve 79 is controlled by a thermo-bulb 81, preferably in contact with the cooled milk. The auxiliary condenser is provided with a float valve 82 and a pipe 83 leading therefrom is connected to the bottom of the condenser 84. The compressor 85, driven by the motor 86, through suitable belting and pulleys (not shown) discharges compressed refrigerant via the pipe 87 into the condenser 84.

The auxiliary receiver is also provided with a curve-shaped pipe 88 extending to a point near the upper inner surface thereof. This pipe is connected via the pipe 89 to the intake of the compressor 85, and a small hole 89 in the curved pipe 88 is provided to allow oil to return from the auxiliary receiver to the crank case of the compressor 85.

A suitable control 92 is connected to the suction side of the system via a pipe 91 and a suitable switch in said control connects or disconnects the motor from a source of current 93.

The auxiliary condenser and receiver are enclosed in an insulated tank 94 and the interior of this tank is filled with a eutectic fluid 95.

With the valve 80 closed, the compressor is operated and the temperature in the auxiliary condenser and the fluid 95 is reduced until the fluid is congealed, gaseous refrigerant passing via the curved pipe 88 and suction line 90 to the compressor and the discharged refrigerant passing via the pipe 87 into the condenser 84. Liquid refrigerant passes from the condenser via the pipe 83 and the float valve 82 when the liquid level in the auxiliary receiver allows the float valve 82 to open.

Due to the fact that the valve 80 is closed, liquid refrigerant in the flooded evaporator 73

does not boil while this congealing process is going on.

As soon as the temperature of the auxiliary condenser and the contents of the tank 94 have been reduced to the point where the fluid 95 has congealed, the control 92 stops the motor and the system is ready to be used for cooling milk.

When the valve 80 is opened, liquid refrigerant rises in the evaporator 73 to the level of that in the auxiliary receiver and gaseous refrigerant seeking the coldest place in the system passes via the regulating valve 79 into the auxiliary condenser 74, where it gives up heat to the eutectic medium 95, is condensed, and passes into the auxiliary receiver.

As soon as any heat enters the auxiliary condenser the pressure therein changes and the control 92 operates and sets the motor and compressor going again. The compressor 85 removes from the auxiliary receiver as much gaseous refrigerant as it can handle and the remainder is liquefied by the frozen fluid 95. When the level of liquid refrigerant in the auxiliary condenser falls sufficiently to open the float valve 82, liquefied refrigerant from the condenser 84 passes via the pipe 83 and the valve 82 into the receiver 76. The same liquid level is maintained in the receiver 76 and the evaporator 73, due to the fact that the open pipe 77 connects the two together.

The system is so proportioned that when its capacity of milk has been cooled, the temperature of the contents of the insulated tank 94 and the temperature of the evaporator 73 are at substantially the same temperature level.

The system shown in Figure 4 is a modification of that in Figure 2, in which the evaporator 96 is operated completely flooded. The evaporator is placed in a quick freezing room 97, which is provided with suitable insulating walls 98, and an open brine tank 99 is provided for catching and retaining the brine in the system. The auxiliary condenser 100 is positioned above the evaporator 96 and is provided with fins 101 and an auxiliary receiver 102, and surrounded by an insulating tank 103 filled with a eutectic fluid 104. A float chamber 105 has a float valve 106 positioned therein and adapted to maintain a liquid level in the system, indicated by the dotted line 107, which is substantially on the center line of the auxiliary receiver 102.

A compressor 39 is connected by a pipe 41 to a condenser 40 and the discharge from the condenser is led into a receiver 109. A liquid line 110 leads liquid refrigerant from the receiver 109 to the float valve 106 in the float chamber 105. Liquid refrigerant passes from the float chamber 105 via the pipe 111 to the bottom coil of the evaporator 96. A branch pipe 112, connected to the pipe 111, is in turn connected to the bottom of the auxiliary receiver 102. The pipe 111 is covered with insulation 113 and the pipe 112 is covered with insulation 114 to insulate the same from the atomized brine which will presently be described.

The evaporator 96 is connected via the pipe 115 to the auxiliary condenser 100 and a shut-off valve 116 is provided therebetween. A pipe 117 leads from the upper surface of the auxiliary receiver to the float chamber 105, and a suction pipe 118 leads from the float chamber 105 to the compressor 39. A motor 72 drives a brine pump 67 and a pipe 66 is provided for leading brine from the tank 99 to the suction of the pump 67. The discharge pipe 68 of the brine pump 67 is

connected to the spray pipes 69 and 70 and these pipes are provided with a plurality of spray nozzles 71, by means of which brine is sprayed or atomized throughout the entire chamber 97.

5 In some cases it may be desired to lead liquid refrigerant directly into the auxiliary condenser, in which case a pipe 119 may extend from the liquid line 110 to the top of the auxiliary condenser 100, and an expansion valve 120 and a hand shut-off valve 121 may be provided. This pipe and these valves are shown dotted in the drawings.

Before operating the system as a quick freezer, the valve 116 may be closed and the compressor 15 39 operated. The gaseous refrigerant passes from the auxiliary receiver via the pipe 117, the float chamber 105, and the suction pipe 118, to the compressor, thence to the condenser, where it is liquefied and it passes on into the receiver 20 109. This process is continued until the entire contents of the insulated tank 103 are so reduced in temperature that the eutectic fluid 104 therein is congealed. During the process, as the refrigerant level goes down, the float valve 106 25 allows liquid refrigerant to pass from the receiver 109 to the float chamber 105, and this liquid, seeking its level, passes via the pipe 112 into the auxiliary receiver 108.

After the eutectic fluid 104 has become congealed the system is ready to operate as a quick freezing system, the valve 116 is opened and gaseous refrigerant, seeking the coldest place, passes into the auxiliary condenser. The compressor 39 removes from the auxiliary receiver as 35 much gaseous refrigerant as it can handle, and the remainder of the refrigerant is condensed by the fluid 104 and passes into the auxiliary receiver 108. As the process continues, the auxiliary condenser condenses less and less of the refrigerant, until the temperature of the evaporator 40 96 and that of the auxiliary condenser 100 is practically the same temperature level. Therefore, by the use of this system, sudden or peak loads of refrigeration may be taken care of, even 45 though they are far beyond the normal capacity of the high side of the system.

What is claimed is:

1. In a refrigerating system in combination a compressor, a condenser, a receiver, an evaporator, an auxiliary condenser coil and an auxiliary receiver arranged in series and connected between said compressor and said evaporator, a series of metallic fins in contact with the coils of said auxiliary condenser and said auxiliary receiver, an expansion valve between the receiver and the evaporator, a second expansion valve between the evaporator and the auxiliary condenser, an insulating casing containing a eutectic fluid surrounding the auxiliary condenser, the auxiliary receiver and said fins, and a suction line in heat exchange relation with and extending from said auxiliary receiver to said compressor, whereby all of the gaseous refrigerant leaving the evaporator is passed through the 65 auxiliary condenser and the auxiliary receiver including that part of said gases which is not intended to be condensed in said auxiliary condenser in order to increase the velocity of and to maintain a turbulent flow of said gaseous refrigerant with a resultant high rate of heat transfer.

2. In a refrigerating system in combination, a compressor, a condenser, a main receiver, an evaporator, an auxiliary condenser and an auxiliary receiver, a series of fins in metallic contact 75 with said auxiliary condenser and said auxiliary

receiver, an insulating casing containing a eutectic medium surrounding the auxiliary condenser and receiver, a float valve in the auxiliary receiver adapted to maintain a constant level of liquid refrigerant therein, a conduit between the auxiliary receiver and the evaporator for allowing said liquid to seek its level in said evaporator, a conduit connecting said evaporator to said auxiliary condenser and containing a regulating valve, and means for storing cold in said medium for liquefying some gaseous refrigerant in the auxiliary condenser thereby effectively increasing the capacity of said system periodically, said auxiliary receiver serving to deliver liquid refrigerant from both the main and the auxiliary condensers 15 to said evaporator.

3. In a refrigerating system in combination, a compressor, a condenser connected thereto, a receiver associated with said condenser, an evaporator, a float chamber positioned above the bottom line of said evaporator and communicating therewith, a liquid refrigerant line leading from said receiver to the float valve for supplying the evaporator with said liquid, an auxiliary condenser positioned above said evaporator, an auxiliary receiver associated with said auxiliary condenser so positioned that it is normally partially filled with liquid, connections between the bottom of the auxiliary receiver, the bottom of the float chamber and the bottom of the evaporator, a pipe leading from the top of the evaporator to the top of the auxiliary condenser, a pipe leading from the top of the auxiliary receiver to the top of the float chamber, a suction line leading from the top of the float chamber to the intake of said compressor, a series of fins in metallic contact with said auxiliary condenser and said auxiliary receiver, and an insulated container containing a eutectic medium surrounding said auxiliary condenser and receiver whereby cold may be stored therein for periodically increasing the effective capacity of the system by enabling the auxiliary condenser to liquefy at least a portion of the refrigerant and deliver the same to the evaporator without allowing it to leave the low side of the system.

4. In a refrigerating system, a compressor, a condenser, and an evaporator, an auxiliary condenser positioned between said evaporator and said compressor, a medium within said casing for storing up cold, said medium being adapted to receive heat only from articles cooled by the evaporator and via a refrigerating medium circulating in said system, a by-pass between said auxiliary condenser and said compressor, and means within said auxiliary condenser to deliver lubricant to said compressor via said by-pass.

5. In a refrigerating system, a compressor and means for driving the same, a condenser, an evaporator having a B. t. u. capacity substantially greater than that of said compressor, an auxiliary condenser, a suction coil, and a receiver therebetween and a eutectic fluid in thermal relation to said receiver and adapted to periodically store up cold, said auxiliary condenser and receiver being connected between said evaporator and said compressor, forming a circuit through which gaseous refrigerant must pass at high velocity to effect efficient heat transfer with said fluid and thereby effectively increasing the refrigerating capacity of the system during a comparatively short period of time.

6. In a refrigerating system, a compressor, a condenser, a main receiver, an evaporator, an auxiliary condenser including a coiled conduit, 75

an auxiliary receiver, a series of metallic fins in thermal contact with said conduit and said auxiliary receiver, a storage medium in contact with said conduit, said auxiliary receiver, and said fins; said auxiliary condenser and said auxiliary receiver being connected in series and associated with the suction end of the evaporator and with the intake of said compressor so that all gaseous refrigerant leaving the evaporator will pass through said auxiliary condenser and said auxiliary receiver with sufficient velocity and turbulence to effect a high rate of heat transfer between said refrigerant and said medium.

7. In a refrigerating system, a compressor, a condenser, a main receiver, an evaporator, an auxiliary condenser including a coiled conduit, an auxiliary receiver, a suction coil; a series of metallic fins in thermal contact with said conduit, said suction coil, and said auxiliary receiver; a storage medium in contact with said conduit, said auxiliary receiver, said suction coil, and said fins; said auxiliary condenser, said suction coil, and said auxiliary receiver being connected in series and associated with the suction end of the evaporator and with the intake of said compressor so that all gaseous refrigerant leaving the evaporator will pass through said auxiliary condenser and said auxiliary receiver with sufficient velocity and turbulence to effect a high rate of heat transfer between said refrigerant and said medium.

8. In a system of the character described, including an evaporator, a condenser, a main receiver, and a compressor; an auxiliary condenser positioned between the evaporator and the intake of said compressor comprising a coil, an auxiliary receiver, a series of fins in thermal contact with said coil and with said auxiliary receiver; a storage medium embracing said coil, said auxiliary receiver and said fins; and an insulating casing surrounding said medium; said coil and said auxiliary receiver being connected in series whereby all gaseous refrigerant from the evaporator may pass therethrough at a high velocity to effect a high rate of heat exchange between said refrigerant and said medium.

9. In a system of the character described, including an evaporator, a condenser, a main receiver, and a compressor; an auxiliary condenser positioned between the evaporator and the intake of said compressor comprising an auxiliary condensing coil, an auxiliary receiver, a suction coil, a series of fins in thermal contact with said coils and with said auxiliary receiver; a storage medium embracing said coils, said auxiliary receiver and said fins; and an insulating casing surrounding said medium; said auxiliary condensing coil and said auxiliary receiver and said suction coil being connected in series whereby all gaseous refrigerant from the evaporator may pass therethrough at a high velocity to effect a high rate of heat exchange between said refrigerant and said medium.

10. In a refrigerating system, a cooling unit, a compressor, a condenser, a receiver associated with one end of said cooling unit, and an auxiliary condenser and auxiliary receiver connected in series between the other end of said cooling unit and the intake of said compressor, a eutectic fluid surrounding said auxiliary condenser and said auxiliary receiver and adapted to store cold to take care of peak loads on said system, said auxiliary condenser being adapted to refrigerate said unit during a portion of the time, and said compressor and said auxiliary condenser being

adapted conjointly to refrigerate said unit during other portions of the time.

11. In a refrigerating system, a cooling unit, a compressor, a condenser, a receiver associated with one end of said cooling unit, and an auxiliary condenser and auxiliary receiver connected in series between the other end of said cooling unit and the intake of said compressor, a eutectic fluid surrounding said auxiliary condenser and said auxiliary receiver and adapted to store cold to take care of peak loads on said system, a liquid line leading from said receiver to said auxiliary receiver, and a liquid line leading from said auxiliary receiver to said evaporator, said auxiliary condenser being adapted to refrigerate said unit during a portion of the time, and said compressor and said auxiliary condenser being adapted conjointly to refrigerate said unit during other portions of the time.

12. In a refrigerating system, a cooling unit, a compressor, a condenser, a receiver associated with one end of said cooling unit, and an auxiliary condenser and auxiliary receiver connected in series between the other end of said cooling unit and the intake of said compressor, a eutectic fluid surrounding said auxiliary condenser and said auxiliary receiver and adapted to store cold to take care of peak loads on said system, said auxiliary condenser being adapted to refrigerate said unit during a portion of the time, and said compressor and said auxiliary condenser being adapted conjointly to refrigerate said unit during other portions of the time, the liquid from said receiver being reduced to a low temperature in said auxiliary receiver before it reaches said evaporator thereby increasing the efficiency of the system.

13. In a refrigerating system, a cooling unit, a compressor, a condenser, a receiver associated with one end of said cooling unit, and an auxiliary condenser and auxiliary receiver connected in series between the other end of said cooling unit and the intake of said compressor, a eutectic fluid surrounding said auxiliary condenser and said auxiliary receiver and adapted to store cold to take care of peak loads on said system, said auxiliary condenser being adapted to refrigerate said unit during a portion of the time, and said compressor and said auxiliary condenser being adapted conjointly to refrigerate said unit during other portions of the time, said auxiliary receiver serving to precool liquid refrigerant delivered to the evaporator, the flash gas being separated in the auxiliary receiver, thereby providing a highly efficient system.

14. In a refrigerating system in combination with a compressor, a condenser, a receiver, an evaporator, a float chamber communicating with one end of said evaporator, an auxiliary condenser and an auxiliary receiver metallically connected together by heat conductive radiating plates, and surrounded by an insulating casing containing a storage medium, connections between one end of said auxiliary condenser and the other end of said evaporator, the other end of said auxiliary condenser being connected to said auxiliary receiver, a connection between the auxiliary receiver and said float chamber, a connection between the intake of said compressor and said float chamber, a connection between said receiver and said float chamber including a float valve in said chamber for controlling the admission of liquid refrigerant thereto from said receiver, a connection between said auxiliary receiver and said first end of said evaporator

whereby liquid refrigerant condensed due to heat exchange with said medium may return to said evaporator without reaching said compressor.

15 In a refrigerating system in combination
5 with a compressor, a condenser, a receiver, an
evaporator, a float chamber communicating with
one end of said evaporator, an auxiliary con-
10 denser and an auxiliary receiver metallica-
lly connected together by radiating plates, and sur-
rounded by an insulating casing containing a
storage medium, connections between one end of
said auxiliary condenser and the other end of said
15 evaporator, the other end of said auxiliary con-
denser being connected to said auxiliary re-
ceiver, a connection between the auxiliary re-
ceiver and said float chamber, a connection be-
tween the intake of said compressor and said float
20 chamber, a connection between said receiver and
said float chamber including a float valve in said
chamber for controlling the admission of liquid
refrigerant thereto from said receiver, a connec-
tion between said auxiliary receiver and said first
25 end of said evaporator whereby liquid refrigerant
condensed due to heat exchange with said
medium may return to said evaporator without
reaching said compressor, and means for spray-
ing brine about said evaporator.

16. The invention according to claim 15, in
30 which shut-off means is included in the connec-
tions between said end of the auxiliary condenser
and said other end of the evaporator, and in
which an expansion valve is provided for deliver-
ing refrigerant from the high side to said auxiliary
condenser.

35 17. In a refrigerating system, a high side, an
expansion valve, a plurality of evaporators each

having one end connected to said valve to re-
ceive liquid refrigerant therefrom in parallel and
having their other ends interconnected to form a
gaseous refrigerant path through said evapora-
5 tors in series and leading to the intake of said
high side.

18. In a refrigerating system including a high
side, an evaporator, an auxiliary condenser con-
nected to said evaporator and forming a portion
of the low side in said system, said auxiliary con-
10 denser being comprised of a continuous coiled
conduit and an auxiliary receiver positioned ad-
jacent thereto and interconnected therewith by
means of a series of heat conductive fins, and an
insulating casing surrounding said auxiliary con-
15 denser and receiver, and containing a eutectic
fluid in thermal-contact with the entire surface
of said conduit, said receiver and said fins.

19. In a refrigerating system including a high
side, an evaporator, an auxiliary condenser con-
20 nected to said evaporator and forming a portion
of the low side in said system, said auxiliary con-
denser being comprised of a continuous coiled
conduit and an auxiliary receiver positioned ad-
jacent thereto and connected to one end thereof,
25 a suction coil positioned adjacent to said conduit
and having one end thereof connected to said
auxiliary receiver, a series of heat conductive fins
in metallic contact with said conduit, said
auxiliary receiver and said suction coil and an
30 insulating casing surrounding said auxiliary con-
denser, said receiver, and said coil, and contain-
ing a eutectic fluid in thermal-contact with the
entire surface of said conduit, said receiver, said
fins, and said suction coil.

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