Nov. 29, 1949 C. C. COONS 2,489,752

REFRIGERATION

Filed Nov. 13, 1944 3 Sheets-Sheet 1

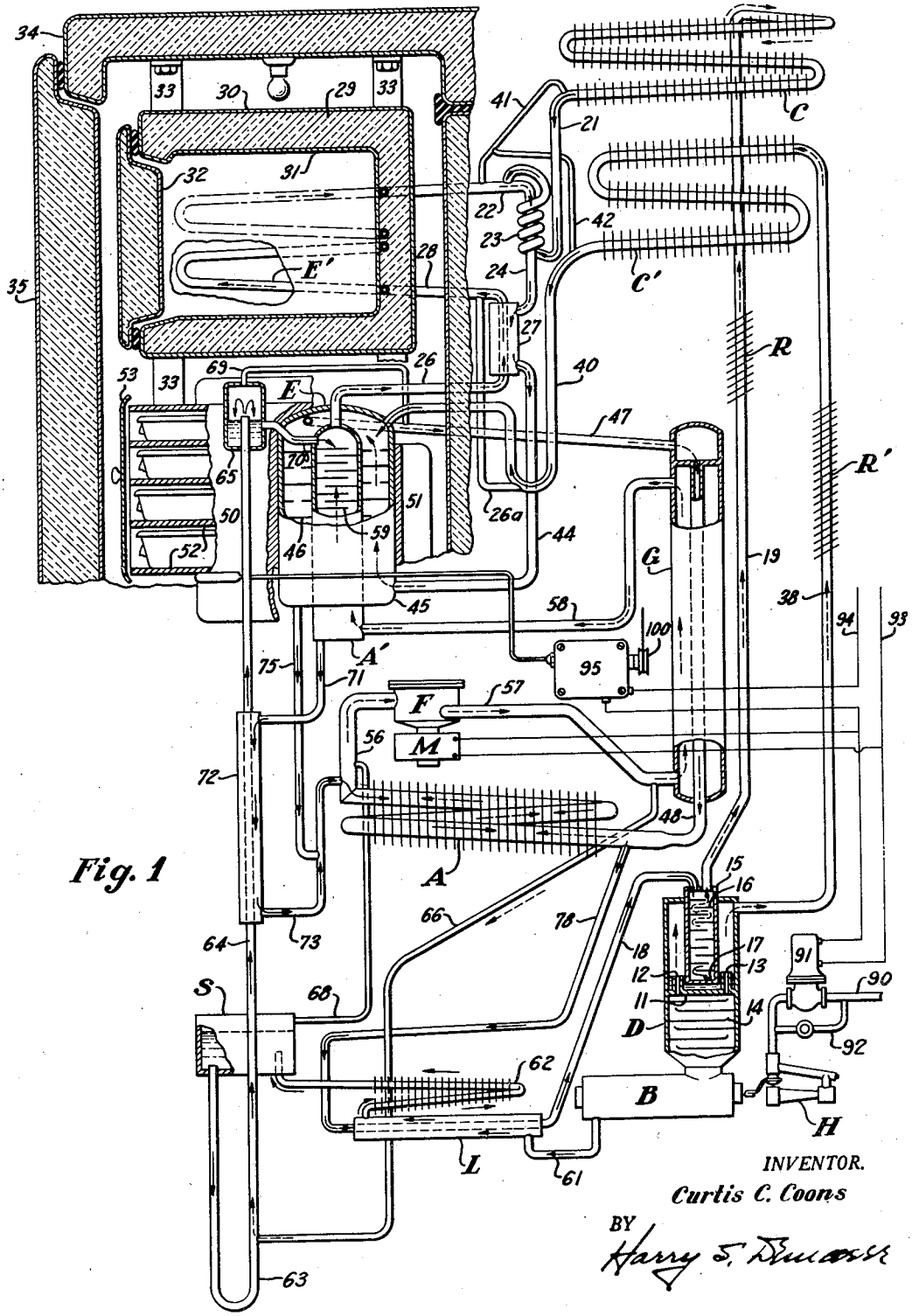


Fig. 1

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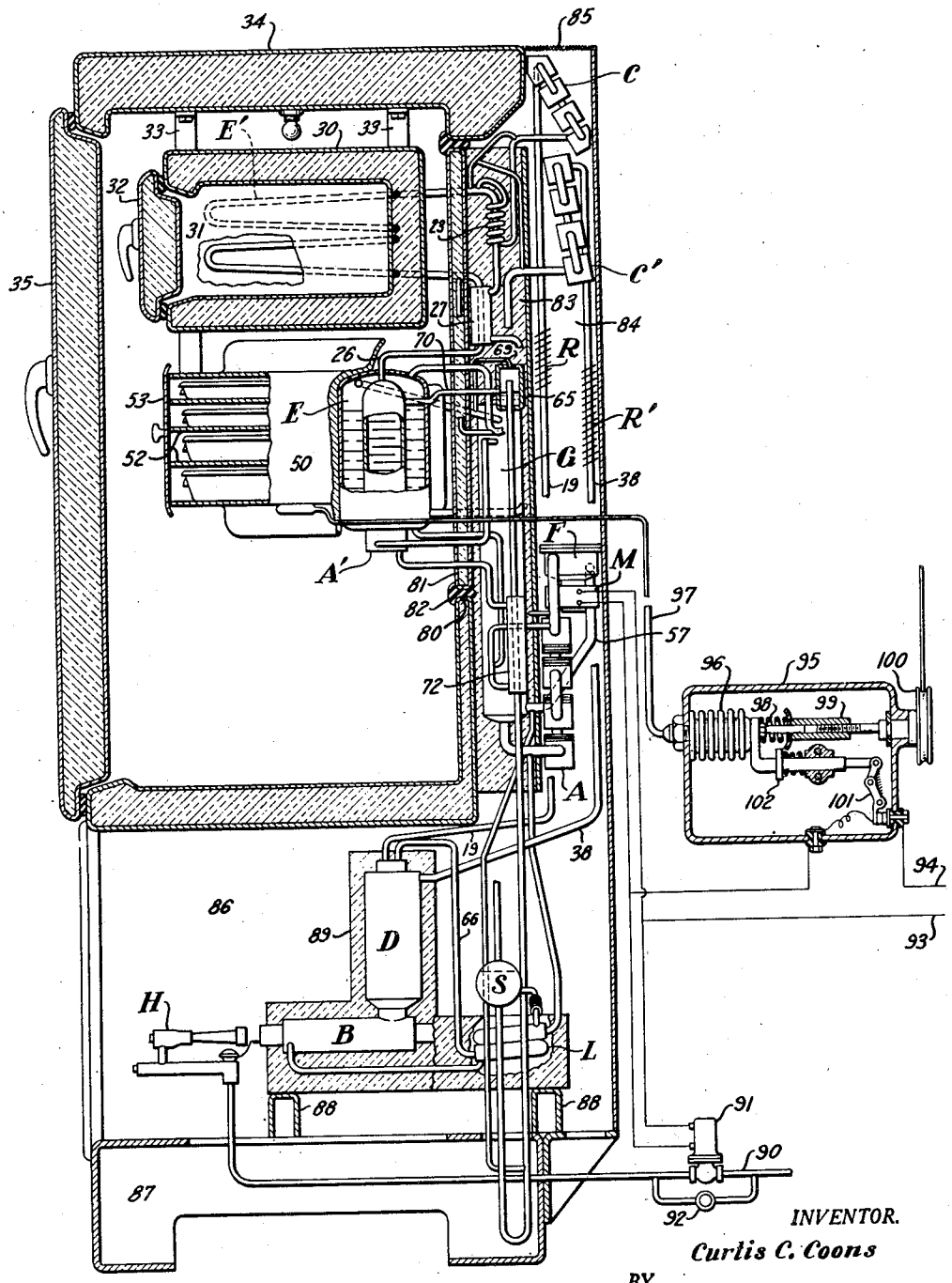


Fig. 2

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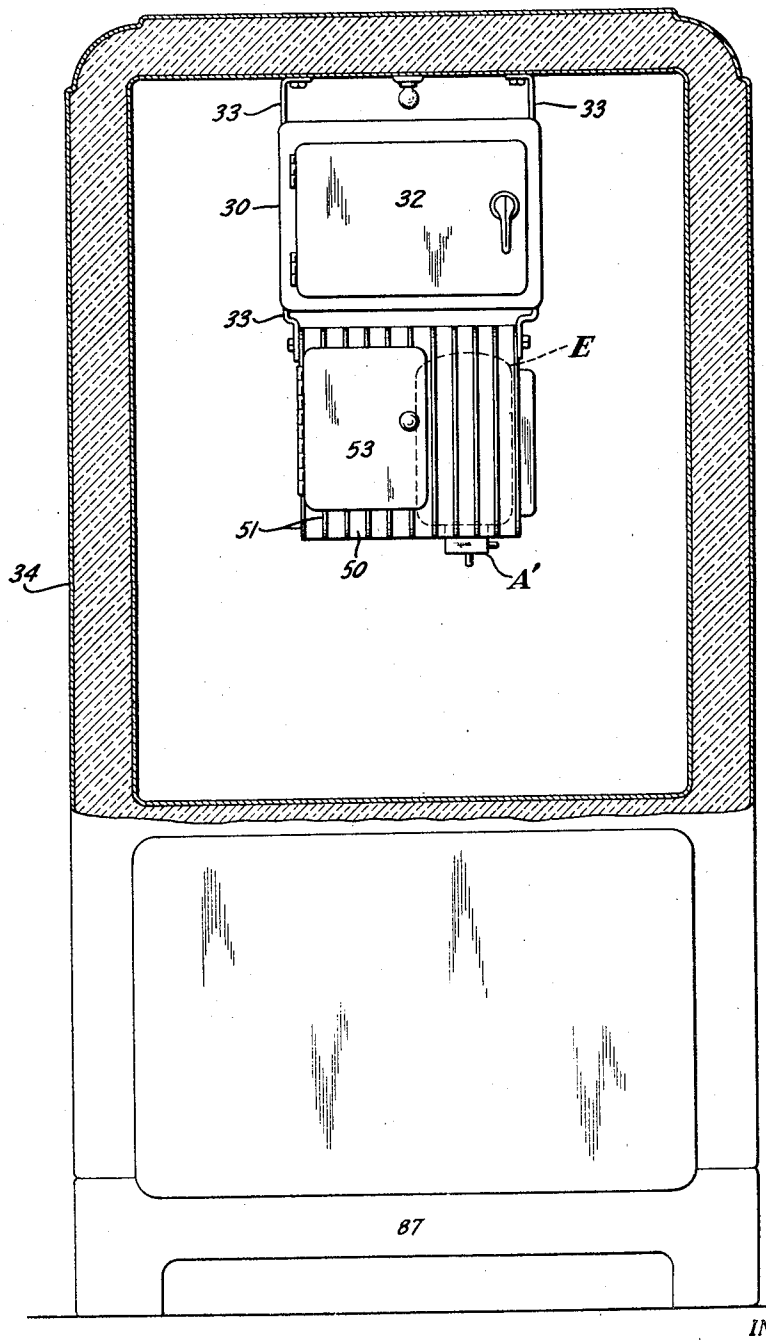


Fig. 3

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2,489,752

REFRIGERATION

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Application November 13, 1944, Serial No. 563,139

13 Claims. (Cl. 62—119.5)

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My invention relates to the art of refrigeration and more particularly to refrigerating systems of the absorption type utilizing an inert pressure equalizing medium particularly constructed and arranged to produce extremely low temperatures in the range of 0° F. and below for the purpose of preserving foodstuffs frozen at temperatures low enough to permit their preservation in the frozen state for long periods of time.

More particularly, it is an object of the present invention to provide an absorption refrigerating system of the pressure equalized type in which refrigerant liquid evaporates into inert pressure equalizing medium in a first concentration range which is extremely low whereby the refrigerant may evaporate thereinto at extremely low temperatures and a second concentration range higher than the first concentration range whereby the refrigerant will evaporate into the inert gas in this concentration range at higher temperatures to satisfy ice freezing and food preserving requirements.

It is a further object of the present invention to provide a refrigerating system of the three-fluid absorption type in which the inert gas traversing the extremely low temperature evaporator is separated from refrigerant vapor by being contacted with very lean solution in an absorbing zone maintained at a low temperature by the principal evaporator of the system.

It is a further object of the present invention to provide a pressure equalized absorption refrigerating system in which the absorbing solution deprived of refrigerant vapor in a heated zone is conveyed first into contact with inert gas in a cold absorbing zone whereby to reduce the refrigerant vapor content of the inert gas in said zone to low value and is then subsequently conveyed to a second absorbing zone which is cooled by air or water wherein the solution absorbs refrigerant vapor from inert gas discharged from a refrigerated zone which cools the first mentioned absorbing zone.

Other objects and advantages of the invention will become apparent as the description proceeds when taken in connection with the accompanying drawing in which:

Figure 1 is a partly broken and partly diagrammatic representation of one form of the invention and associated cabinet construction.

Figure 2 is a side elevational sectional view of the refrigerating apparatus of Figure 1 associated with a cabinet structure.

Figure 3 is a front elevational view partly in

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section illustrating the cabinet arrangement of the refrigerating system of Figures 1 and 2.

Throughout the drawing gas or vapor is indicated by dotted arrows and liquid is indicated by solid arrows.

Referring now to the drawing in detail, there is illustrated a three-fluid absorption refrigerating system of the pressure equalized type which is charged with a suitable absorbing medium, such as water, a refrigerant, such as ammonia, and a pressure equalizing medium which is inert to the refrigerant and absorbent, preferably a dense inert gas like nitrogen.

The refrigerating system consists of a generator or boiler B arranged to be heated by any suitable means, such as the combustible fuel burner H. Positioned above the boiler is a multiple analyzer structure generally designated as D in open communication with the boiler B. The analyzer D is internally divided by a horizontal partition 11 which is pierced by an overflow conduit 12 and a vapor discharge conduit 13 of greater height than conduit 12. Below the partition 11 the analyzer D is also provided with a plurality of plates 14 to produce an extended vapor and liquid contact path. Above the partition 11 there is mounted a second analyzing vessel 15 provided interiorly thereof with a plurality of plates 16 similar to the plates 14 previously mentioned. An opening 17 is provided in the bottom wall of the analyzer 15 below the level of the upper portion of overflow conduit 12 whereby the opening 17 will be below the level of solution maintained on top of partition 11 by conduit 12.

Rich solution is supplied to vessel 15 through conduit 18 from a source to be more fully developed hereinafter. The rich solution flows downwardly through vessel 15 over plates 16 and is heated by hot vapor from the boiler B discharged into the space around vessel 15 by the vapor conduit 13. This action serves to liberate some refrigerant vapor from the strong solution in vessel 15 and to condense absorption solution from the vapor surrounding the vessel 15.

The partially weakened absorption solution produced in vessel 15 passes through the opening 17 into the pool of solution maintained by the partition 11 and ultimately flows through conduit 12 and analyzer D into the boiler B.

The vapor produced in vessel 15 is conducted by conduit 19 and rectifier R to the upper portion of a tubular air-cooled condenser C wherein it is liquefied and the heat of condensation is rejected to the atmosphere flowing across the fins on condenser C.

Liquid refrigerant formed in condenser C is almost totally free of absorption solution because it was evolved from extremely rich absorbing solution in vessel 15 and it has further been purified in rectifier R. The condensate formed in condenser C is conducted from the bottom of the condenser through a U-shaped liquid sealing conduit 21 into the upper gas discharge portion 22 of an evaporator E'. The rising leg 23 of conduit 21 is coiled around a cold gas conduit 24 to precool the liquid refrigerant.

The liquid refrigerant supplied to the evaporator E' flows downwardly by gravity in counterflow relationship and in contact with a stream of very lean inert gas which flows from an absorber A' through conduit 26, gas heat exchanger 27 and conduit 28 into the lower portion of the evaporator E'.

The evaporator E' is embedded in the insulation 29 of a low temperature food preserving chamber 30 and is in thermal contact with the inner liner plate 31 of the chamber 30. The chamber 30 is provided with a suitable insulated closure member 32 to allow access to the interior thereof, and the whole chamber 30 is supported by brackets 33 from the top wall of and within an insulated cabinet construction generally indicated at 34 which is provided with the usual insulated closure 35.

The vapor in the upper part of the analyzer surrounding the chamber 15 is conducted to the condenser C' by a conduit 38 which includes a rectifier R' wherein absorbing solution condenses and flows backwardly into the analyzer structure. The refrigerant vapor supplied to condenser C' is liquefied therein by heat exchange with atmospheric air and the resulting liquid is conducted into a tubular tank type evaporator E by a conduit 40 including a U-shaped liquid seal trap portion. The condenser sides of traps 21 and 40 are vented to gas conduit 22 by vent conduits 41 and 42, respectively.

Evaporator E consists of a tank or vessel 45 which encloses the absorber A'. The annular chamber formed between the absorber A' and the outer wall of tank 45 is provided with a plurality of liquid and gas guiding baffle plates 46 to provide for gas and liquid contact. The liquid refrigerant discharged through conduit 40 flows downwardly over the baffles in counterflow relationship and in contact with an inert gas stream which comes from the upper evaporator E' by way of conduits 22 and 24, gas heat exchanger 27 and conduit 44. The inert gas flows upwardly through the evaporator from which it is removed by conduit 47 and conducted to the lower portion of a tubular air-cooled absorber A by way of the inner path of gas heat exchanger G and conduit 48.

The evaporator E is enclosed within and closely engaged by a casting 50 which is provided with air-cooling fins 51. A plurality of ice trays receiving shelves 52 extend forwardly of the tank 45 and are closed by an access closure 53. The evaporator E and its associated casting 50 is supported beneath the chamber 30 by extensions of brackets 33.

A drain conduit 26a is connected between the gas conduit 28 and the condensate conduit 40 to provide for flow of excess refrigerant and non-volatile material from evaporator E' to evaporator E. Conduit 26a connects to the lower part of conduit 40 to provide gas sealed liquid traps between the evaporators.

Rich inert gas entering the lower portion of

absorber A through conduit 48 flows upwardly therethrough in contact with and in counterflow relationship with absorbing solution supplied in a manner to be described hereinafter. The absorbing solution removes refrigerant vapor from the rich gas and the resulting heat of absorption is rejected to the atmospheric air flowing over the exterior walls and attached fins on the absorber conduit. The lean gas is then conducted from the upper portion of the absorber A to the suction side of a circulating fan F by means of a conduit 56. The fan F is driven by an electrical motor M and is of the hermetically sealed type such as that disclosed in U. S. Letters Patent 2,307,113, dated January 5, 1943. The gas placed under pressure by the fan F is conducted therefrom to the lower portion of absorber A' through conduit 57, the outer pass of gas heat exchanger G and conduit 58.

The lean gas flows upwardly through the absorber vessel A' in contact with the lean absorbing solution flowing downwardly therethrough over the baffle plates 59. Since the absorber A' is maintained at a very low temperature because it is completely encased within the evaporator E, the refrigerant vapor content of the lean inert gas is further reduced to an extremely low value in the absorber A' and the inert gas which is then conducted from the upper portion of absorber A' to the evaporator E' through conduit 26, heat exchanger 27 and conduit 28 has an extremely low refrigerant vapor concentration.

The lean absorbing solution formed in the generator B by the evolution of refrigerant vapor is conducted therefrom to a solution reservoir S through conduit 61, liquid heat exchanger L, and the tubular finned air-cooled liquid precooler 62. Absorbing solution is withdrawn from the vessel S through the U-shaped bottom portion 63 of a gas lift conduit 64 which discharges the solution into a gas separation chamber 65 positioned slightly above the upper portion of absorber A'. Pumping gas is supplied to the lower portion of the gas lift conduit 64 below the liquid level therein by a conduit 66 which conducts pumping gas from the rich gas discharge conduit 57 of the circulating fan F. The reservoir S is vented through a conduit 68 to the gas conduit 56 which connects directly to the suction side of the circulating fan F. Pumping gas discharging into chamber 65, is purged therefrom into the rich gas conduit 47 through conduit 69.

The lean solution discharged into chamber 65 flows through a conduit 70 into the upper portion of the absorber A' where it is brought into contact with the lean gas discharged from absorber A. Solution is withdrawn from the lower portion of absorber A' and conducted to the upper portion of the absorber A by conduit 71, liquid heat exchanger 72, which surrounds a portion of the gas lift pump 64, and conduit 73. The solution flows downwardly by gravity through the air cooled absorber A in contact with and in counterflow relation to the rich inert gas flowing upwardly through absorber A. The solution is enriched by the absorption of refrigerant vapor. Rich solution is then conducted from the bottom of the absorber A to the analyzing chamber 15 by conduit 78, liquid heat exchanger L and conduit 18, thus completing the solution circuit.

Excess refrigerant and non-volatile material drains from the evaporator E' to evaporator E through conduit 26a in the manner disclosed hereinbefore. These non-volatile materials to-

gether with those formed directly in evaporator E are returned to the solution circuit by conduit 75 which connects the bottom of evaporator E to conduit 73 sufficiently below the upper portion thereof to insure a liquid gas seal in the bottom part of conduit 75.

Referring now to Figure 2 the manner of assembly of the apparatus with the cabinet will be described. As before mentioned the bracket 33 supports the low temperature insulated freezing chamber 30 in superimposed relation to the finned ice freezing and air-cooling structure 50 which encloses the evaporator E and absorber A'. The insulation of the rear wall of the cabinet is provided with an opening as indicated at 80 which is closed by a removable insulated panel 81 mounted as part of a refrigerating system and is sealed by a suitable gasket 82. The heat exchangers G, 27, and 72, the gas separation chamber 65, the coiled heat exchange portion 23 of the conduit 21 and various connecting conduits are all embedded in a second insulated body of material 83 which is also securely attached to the refrigerating mechanism. The panel 81 is of sufficient size to permit the evaporator structures 30 and 50 to be inserted into the interior of the cabinet 34 through the opening 80. The insulating structure 83 is of greater length than the opening 80 and fits in a conforming recess in the rear wall insulation of the cabinet structure. The condensers C and C', rectifiers R and R', the motor fan assembly MF and the air-cooled absorber A are all positioned in a rear vertical flue 84 formed in the cabinet structure to permit cooling air to flow vertically over these members and to discharge through the screen 85 at the top of the flue, which is level with the top wall of the cabinet structure as a whole.

A mechanism compartment 86 is positioned under the food storage structure or insulated structure of the cabinet above the base frame 87 of the cabinet. The base frame allows free access of cooling and combustion air into the chamber 86 and flue 84.

The boiler-analyzer assembly BD and the liquid heat exchanger L are encased in a body of insulating material 89 which rests upon transverse channel elements 88 secured to the base frame 87. Various angle iron frame members, not shown, may be provided to support the upper portions of the refrigerating mechanism in the base frame.

As illustrated, fuel such as gas is supplied to the burner H through a conduit 90 which is controlled by a solenoid valve 91. A pilot bypass 92 is provided around this valve to maintain an ignition flame on the burner H. The electrical motor M for the circulating fan F and the solenoid valve 91 are energized from a suitable source of electrical supply 93 and 94. The electrical line 94 has a thermostatic switch mechanism 95 included therein to control the supply of fuel to the burner and the operation of the electrical motor.

The control mechanism 95 consists of a control bellows 96 which is responsive to the temperature of the chilling unit structure 50 through a capillary tube 97. The bellows acts against the bias of a spring 98, the tension of which is adjusted by a nut arrangement 99. The adjusting nut 99 is regulated by a suitable motion transfer mechanism diagrammatically illustrated as a belt and pulley at 100 which is actuated by a suitable dial, not shown, which may be placed either inside the cabinet or in any convenient wall

thereof. The bellows 96 actuates a snap-acting electrical switch 101 through an operating arm 102 to control the operation of the motor M and the solenoid valve 91.

In Figure 3 the arrangement of the evaporator structure in the cabinet is illustrated in front view from which it is apparent that the tubular evaporator E and its associated absorber A' are positioned to one side and at the rear of the casting 50 so that the ice receiving shelves 52, which are hidden by the door 53 in this view, may extend substantially the full depth of the insulated interior of the cabinet 34. If desired, absorber A' may be placed in the rear or bottom of the cabinet and insulated specially or be embedded in the cabinet insulation. In such cases the heat of absorption will be rejected to evaporator E by a suitable metal or circulating fluid heat transfer system.

In the operation of the invention the inert gas traverses a path in which its refrigerant vapor concentration is reduced at a first temperature level in the absorber A and is reduced still further to an extremely low level and at a lower temperature level in the absorber A'. The resulting extremely lean inert gas is then conducted to the evaporator E' as a consequence of which evaporation can occur in that evaporator at extremely low temperature levels to produce refrigerating temperatures suitable for the preservation of frozen foodstuffs, such as those now preserved by a quick freezing process. The inert gas has its refrigerant vapor concentration raised to some extent in the evaporator E'. The inert gas discharging from evaporator E' is relatively lean because the evaporator E' is heavily insulated, the whole freezing chamber is encased in a refrigerating chamber, and the load on such elements is not great as such foodstuffs will normally be frozen when placed within the chamber 30, all of which tend to restrict the evaporation of refrigerant in evaporator E' to a small quantity. The amounts of refrigeration required to maintain the desired very low temperatures in evaporator E' are not large and the inert gas initially has a very low refrigerant vapor content so the gas discharged to the principal evaporator E is lean enough to produce refrigerating temperatures sufficient to freeze ice and to maintain desirable food preservation temperatures in the food storage space of the cabinet. The gas enriched in the evaporator E returns to the initial absorber A. Briefly stated, the initially extremely lean inert gas is partially enriched at a first temperature level, further enriched at a second temperature level, partially relieved of its vapor content at a first temperature level and further relieved of its vapor content at a second temperature level.

The very lean absorbing solution formed in the boiler B is first partially enriched with refrigerant at a low temperature in the absorber A' and is then further enriched with refrigerant at a higher temperature in the absorber A. The very rich solution thus formed is partially relieved of its absorbed refrigerant under conditions very unfavorable to the evolution of vapor of the absorbent in the first analyzer heating chamber 15 and is further relieved of vapor in the second analyzer D and is stripped of its vapor in the boiler B. In the normal course of events the boiler B will be at a slightly higher temperature than the analyzer D and the analyzer D will be at a somewhat higher temperature than the interior of the heating chamber 15 so that the ex-

tremely low temperature evaporator E' receives pure liquid refrigerant uncontaminated by absorbing solution.

The hereindescribed invention provides a very satisfactory system for producing extremely low temperature refrigeration to preserve quick frozen foodstuffs in conjunction with a domestic refrigerator cabinet which is accomplished by a multi-step and multi-temperature level evaporation and absorption in a single refrigerating system.

While I have illustrated and described the invention in considerable detail, it is to be understood that various changes may be made in the arrangement, proportion and construction of parts without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. In an absorption refrigerating apparatus a plurality of evaporators, an absorber, a generator assembly including a boiler part, an analyzer part, a heat transfer chamber arranged to be heated by vapor discharged from said analyzer part and means arranged to allow passage of liquid from said heat transfer part to said boiler and analyzer parts and to prevent passage of vapor between said parts; means for conducting rich absorption solution from said absorber to said heat transfer part, means for condensing refrigerant vapor evolved in said heat transfer part and for supplying such condensed vapor to one of said evaporators, means for condensing refrigerant vapor produced in said boiler and analyzer parts and for supplying such condensed vapor to the other evaporator, and means including said absorber for absorbing refrigerant vapor produced in said evaporators in absorption solution withdrawn from said boiler part.

2. In a refrigerating apparatus a generator, an absorber, means for conducting strong absorption solution from said absorber to said generator in heat exchange relation with vapor produced in said generator, a first evaporator, a first condenser arranged to receive vapor evolved from strong solution in said heat exchange means and to supply refrigerant liquid to said first evaporator, a second evaporator, a condenser arranged to receive refrigerant vapor from said generator and to supply refrigerant liquid to said second evaporator, an auxiliary absorber arranged to be cooled by said second evaporator and to absorb refrigerant vapor from said first evaporator, and means for conducting refrigerant vapor from said second evapoator to said first mentioned absorber.

3. In a refrigerating apparatus, a cabinet structure including an insulated food storage chamber, an insulated low temperature chamber, a freezing chamber, a refrigerating apparatus of the absorption type associated with said cabinet structure including a first evaporator arranged to refrigerate said low temperature chamber, a second evaporator arranged to refrigerate said storage chamber and said freezing chamber, a first absorber arranged to be cooled by said second evaporator, a second absorber positioned exteriorly of said chambers, refrigerant vapor generating means, condensing means arranged to receive refrigerant vapor from said generating means and to supply refrigerant liquid to said evaporators, means for circulating absorbing solution between said generating means and said absorbers including means for conducting lean absorbing solution from said generating means to said first absorber, means for conducting inert gas in paths of flow including said absorbers and said evaporators so arranged that inert gas reduced in refrigerant vapor content in said first absorber flows to said first evaporator.

4. In a refrigerating apparatus, a cabinet structure including an insulated storage chamber, an insulated low temperature chamber positioned within said storage chamber, a freezing chamber and air-cooling structure within said storage chamber, a refrigerating apparatus of the absorption type associated with said cabinet structure including a first evaporator arranged to refrigerate said low temperature refrigerating chamber, a first absorber positioned within the confines of said freezing chamber and air-cooling structure, a second evaporator arranged to refrigerate said first absorber and said freezing chamber and air-cooling structure, a second absorber in said cabinet structure exteriorly of all of said chambers, refrigerant vapor generating means, condensing means arranged to receive refrigerant vapor from said generating means and to supply refrigerant liquid to said evaporators, means for circulating inert gas through said evaporators and said absorbers so constructed and arranged that said first evaporator receives inert gas which has been reduced in refrigerant vapor content by said first absorber, and means for circulating absorption solution in a path of flow including said generating means and said absorbers.

5. In a refrigerating apparatus, a cabinet structure including an insulated storage chamber, an insulated low temperature refrigerating chamber positioned within said storage chamber, a freezing chamber positioned within said storage chamber, a refrigerating apparatus of the absorption type associated with said cabinet structure including a first evaporator arranged to refrigerate said low temperature refrigerating chamber, a second evaporator arranged to refrigerate said storage chamber and said freezing chamber, a first absorber arranged to be cooled by said second evaporator, a second absorber in said cabinet structure exteriorly of all of said chambers, refrigerant vapor generating means, condensing means arranged to receive refrigerant vapor from said generating means and to supply refrigerant liquid to said evaporators, means for circulating inert gas through said evaporators and said absorbers so constructed and arranged that said first evaporator receives inert gas which has been reduced in refrigerant vapor content by said first absorber, and means for circulating absorption solution in a path of flow including said generating means and said absorbers.

6. In a refrigerating apparatus, a cabinet structure including an insulated food storage chamber, an insulated low temperature chamber, a freezing chamber, a refrigerating apparatus of the absorption type associated with said cabinet structure including a first evaporator arranged to refrigerate said low temperature chamber, a second evaporator arranged to refrigerate said storage chamber and said freezing chamber, a first absorber arranged to be cooled by said second evaporator, a second absorber positioned exteriorly of said chambers, refrigerant vapor generating means, condensing means arranged to receive refrigerant vapor from said generating means and to supply refrigerant liquid to said evaporators, means for

conducting absorption solution from said generating means to said first and second absorbers in that order and for conducting such solution from said second absorber to said generating means, means for conducting inert gas in paths of flow including said absorbers and said evaporators so arranged that inert gas reduced in refrigerant vapor content in said first absorber flows to said first evaporator.

7. In a refrigerating apparatus, a cabinet structure including an insulated food storage chamber, an insulated low temperature chamber, a freezing chamber, a refrigerating apparatus of the absorption type associated with said cabinet structure including a first evaporator arranged to refrigerate said low temperature chamber, a second evaporator arranged to refrigerate said storage chamber and said freezing chamber, a first absorber arranged to be cooled by said second evaporator, a second absorber positioned exteriorly of said chambers, refrigerant vapor generating means, condensing means arranged to receive refrigerant vapor from said generating means and to supply refrigerant liquid to said evaporators, means for circulating absorption solution between said generating means and said absorbers, means for conducting inert gas in paths of flow including said absorbers and said evaporators so arranged that inert gas reduced in refrigerant vapor content in said first absorber flows to said first evaporator.

8. In an absorption refrigerating apparatus, a pair of evaporators, an absorbing structure associated with said evaporators, a generator, means for conveying rich absorption solution from said absorbing structure to said generator including a heat exchange device arranged to be heated by vapor evolved in said generator, means for conducting vapor evolved in said generator to a first condenser including said heat exchange device in which said vapor heats rich solution flowing to said generator sufficiently to evolve refrigerant vapor from said solution, means for supplying condensate from said first condenser to a first one of said evaporators, means for condensing refrigerant vapor evolved from rich solution in said heat exchange device and for supplying condensate to the second one of said evaporators, said absorbing structure including an absorber element arranged to reject heat of absorption to said first evaporator, means for conducting highly stripped inert gas from said absorber element to said second evaporator, and means for conducting lean absorbing solution from said generator to said absorber element.

9. In a refrigerating apparatus, a cabinet structure including an insulated storage chamber, an insulated low temperature refrigerating chamber positioned within said storage chamber, a freezing chamber positioned within said storage chamber, means for cooling the air in said storage chamber, a refrigerating apparatus of the absorption type associated with said cabinet structure including a first evaporator arranged to refrigerate said low temperature refrigerating chamber, a second evaporator arranged to refrigerate said air-cooling means and said freezing chamber, a first absorber within the confines of said freezing chamber and air-cooling means arranged to be cooled by said second evaporator, a second absorber in said cabinet structure exteriorly of all of said chambers, refrigerant vapor generating means, condensing means arranged to receive refrigerant vapor from said generating means and to supply refrigerant liquid to said

evaporators, means for circulating inert gas through said evaporators and said absorbers so constructed and arranged that said first evaporator receives inert gas which has been reduced in refrigerant vapor content by said first absorber, and means for circulating absorption solution in a path of flow including said generating means and said absorbers.

10. In a refrigerator a cabinet structure having an insulated refrigerating chamber, an ice freezing compartment in said chamber, an insulated low temperature storage compartment in said chamber, a low temperature cooling unit arranged to refrigerate said low temperature compartment, a cooling unit arranged to refrigerate said ice freezing compartment and said chamber, means for supplying refrigerant liquid to said cooling units, means for supplying highly stripped inert gas to said low temperature cooling unit including an absorber arranged to reject heat of absorption to said ice freezing cooling unit, and an absorber cooled by a medium externally of said refrigerating chamber connected to receive inert gas from said ice freezing cooling unit.

11. In a refrigerator, a first evaporator adapted to refrigerate a low temperature food storage compartment, a second evaporator, freezing receptacle supporting means in heat exchange with said second evaporator, a first absorber in heat exchange with said second evaporator, a second absorber out of heat transfer relation with said evaporators and said first absorber, refrigerant vapor generating means, means for condensing refrigerant vapor liberated in said generating means and for supplying refrigerant liquid to said evaporators, means for circulating absorbing solution through said absorbers and said generating means, and means for flowing inert gas from said first absorber to said first evaporator and from said second evaporator to said second absorber.

12. In a refrigerator, a first evaporator adapted to refrigerate a low temperature food storage compartment, a second evaporator, freezing receptacle supporting means in heat exchange with said second evaporator, a first absorber in heat exchange with said second evaporator, a second absorber out of heat transfer relation with said evaporators and said first absorber, refrigerant vapor generating means, means for condensing refrigerant vapor liberated in said generating means and for supplying refrigerant liquid to said evaporators, means for circulating absorbing solution through said absorbers and said generating means, means for flowing inert gas from said first absorber to said first evaporator in heat exchange relation with inert gas flowing from said first evaporator, and means for flowing inert gas from said second evaporator to said second absorber.

13. In a refrigerator, a first evaporator adapted to refrigerate a low temperature food storage compartment, a second evaporator, freezing receptacle supporting means in heat exchange with said second evaporator, a first absorber in heat exchange with said second evaporator, a second absorber out of heat transfer relation with said evaporators and said first absorber, refrigerant vapor generating means, means for condensing refrigerant vapor liberated in said generating means and for supplying refrigerant liquid to said second evaporator and to said first evaporator in heat exchange relation with inert gas flowing out of said first evaporator, means for circulating absorbing solution through said absorbers and said

generating means, and means for flowing inert gas from said first absorber to said first evaporator and from said second evaporator to said second absorber.

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