

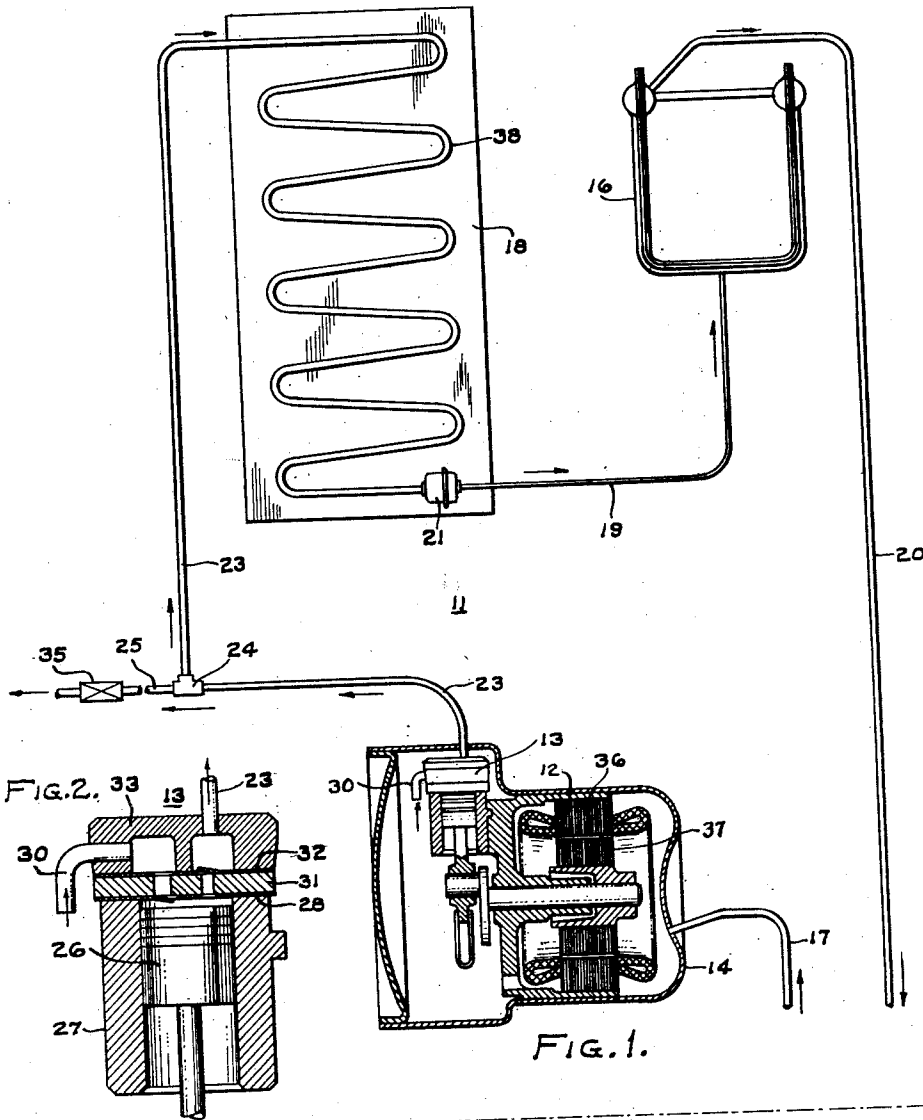
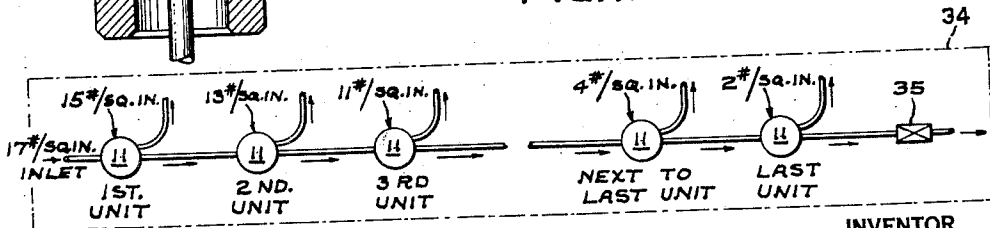
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METHOD OF MANUFACTURING REFRIGERATING SYSTEMS

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WITNESSES:

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FIG. 3.

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METHOD OF MANUFACTURING REFRIG- ERATING SYSTEMS

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8 Claims. (Cl. 62—170)

My invention relates to a method of manu-
facturing refrigerating systems and particularly
to a method of dehydrating refrigerating systems
prior to charging them with refrigerant.

It is a primary object of my invention to pro-
vide improved dehydration of refrigerating sys-
tems, on a large production basis.

It is a further object of my invention to in-
sure a flow of dry gas to all parts of a refriger-
ating system during dehydration, so that sub-
stantially all moisture is removed from every
part of the system.

It is another object of my invention to accu-
rately control the flow of dry gas through the
refrigerating system during dehydration and to
facilitate the testing of gas flow and ultimate
dryness in the system.

It is still another object of my invention to
provide a plurality of air flow paths through
each refrigerating system and furthermore to
provide for a flow of dry gas through a plurality
of systems in series.

These and other objects are effected by my
invention as will be apparent from the following
description and claims taken in connection with
the accompanying drawing forming a part of this
application, in which:

Fig. 1 is a diagrammatic view of a refriger-
ating system with conduit connections so ar-
ranged that the gas flows through the system
in accordance with the present invention;

Fig. 2 is a diagrammatic view of a compressor
showing the flow of gas therethrough; and,

Fig. 3 is a diagrammatic view of a plurality
of the refrigerating systems shown in Fig. 1
connected in series and disposed in an oven.

Referring specifically to the drawing for a
detailed description of my invention, a complete
refrigerating system is designated by the nu-
meral 11 and comprises a motor 12 which drives
a compressor 13. A hermetically-sealed casing
14 encloses the motor and compressor. A con-
duit 17 at the motor end of the sealed casing 14
is open to atmosphere. A conduit 20 connects
with an evaporator 16 and is connected to con-
duit 17 after dehydration to afford communica-
tion between the evaporator 16 and the interior
of the sealed casing 14. The evaporator 16 is
also connected to a condenser 18 through a cap-
illary tube flow-restricting device 19 and a
screen element 21, which are shown by way of
example. The condenser 18 is connected to the
discharge of the compressor 13 through a con-
duit 23, which conduit 23 is provided with a T-
fitting 24. An open conduit 25 extends into the

T-fitting 24 for a purpose hereinafter described.

The compressor 13 comprises a piston 26 which
is reciprocated in a cylinder 27. A suction valve
plate 28 is held in position between the cylinder
27 and a separator disk 31 and a discharge valve
plate 32 is retained in position between disk 31
and a cylinder head 33. The compressor is pro-
vided with a suction inlet conduit 30 which is
in open communication with the interior of the
sealed casing 14. During dehydration, the mo-
tor 12 and compressor 13 are inactive.

The system thus described is dehydrated in
the following manner: First the conduit 25 of
the first unit is connected to the conduit 17 of
the second unit, and so on until seven or eight
complete refrigerating systems are connected in
series, as shown in Fig. 3. The conduit 20 is
left open to atmosphere and at the end of the
series, a restricting valve 35 is provided on con-
duit 25 of the last refrigerating system for a
purpose hereinafter described. The series of
refrigerating systems are then placed in a de-
hydrating oven, shown diagrammatically at 34
in Fig. 3, which is maintained at a predeter-
mined elevated temperature around 125° C. Dry
gas, for example, air, at a predetermined pres-
sure is then supplied to the open conduit 17 of
the first refrigerating system. While it is pref-
erable to use dry gas at all times, this procedure
is not absolutely essential, as ordinary room air
may be used for several hours at the beginning
of dehydration to sweep out the steam atmos-
phere generated by oven heat, and dry gas used
only at the end of the dehydration period so
that the air or gas remaining is as dry as the
atmosphere in the individual units.

The gas then flows through each system in
the following paths. All the gas is conveyed
through the interior of the sealed casing 14,
first passing over the motor 12. The motor of
the refrigerating system comprises a stator 36
and a rotor 37. The stator 36 is usually formed
of a coil of wire which is covered, for example,
by cotton or enamel insulation and the stator is
the most difficult part of the system to dry.
Since all the gas is conveyed through the motor
12, proper drying thereof is insured.

After the gas leaves the motor 12, it enters the
suction inlet conduit 30 of the compressor. The
gas, naturally, is under positive pressure so that,
as shown in Fig. 2, it depresses the suction valve
28, flows into the cylinder 27, raises the discharge
valve 32, and is discharged through conduit 23
which leads to the condenser 18. Most of the
gas is conveyed through fitting 24 and conduit 25

to the next refrigerating system in the series, since conduit 25 of one system is connected to conduit 17 of the next system. However, an appreciable amount of the gas circulates through passages 38 of the condenser, through screen element 21, capillary tube 19, evaporator 16 and is discharged through the open conduit 20, thus dehydrating those parts of the system. The restricting valve 35 on the conduit 25 of the last refrigerating system in the series maintains a sufficient back pressure throughout the series of refrigeration systems to overcome the restriction of the capillary tubes 19 and to insure flow of gas therethrough. By maintaining the gas inlet pressure within predetermined limits, and the flow of gas at the outlet of the last unit at a predetermined value, a definite supply of gas to all the units in the series is insured. As shown in Fig. 3, the gas is at a pressure of, for example, 17 lbs. per square inch gauge at the conduit 17 of the first unit and drops approximately 2 lbs. per square inch as it passes through each unit, the pressure in the last unit being about 2 lbs. per square inch gauge.

Several distinct advantages are realized by utilizing the gas flow just described. First, as stated hereinbefore, an adequate supply of gas is insured for drying the motor 13, which is the most difficult part of the system to dehydrate. Secondly, a flow of gas is insured through the condenser 18, capillary tube 19 and evaporator 16, since it is possible for an attendant to place his finger over the end of the conduit 20 and determine if gas is flowing therethrough. If the capillary tube or some other part of the passage is clogged, it will be ascertained at once and corrected. Therefore, proper dehydration is insured and systems with clogged capillary tubes or the like are discovered before the expense of charging the system with refrigerant and lubricant is incurred. Furthermore, the moisture contained in the passages 38 of condenser 18, capillary tube 19, evaporator 16 and conduit 20 is exhausted through conduit 20 and does not enter the next system in the series. In addition, because of the positive gas flow through all parts of every refrigerating system, and the ease of determining gas flow, the method is cheaper than former methods, results in less wet systems after charging with refrigerant and provides a better quality product on a large production basis.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. The method of dehydrating refrigeration apparatus before it is charged with a refrigerant, which refrigeration apparatus includes a motor, a compressor, a condenser, an evaporator, a flow-restricting device disposed between the condenser and evaporator and passages connecting said parts and forming therewith a circuit for the flow of gas, which method comprises passing gas first through said motor, exhausting a portion of the gas which has passed through said motor exteriorly of said circuit before it enters the condenser or evaporator, passing another portion of said gas, which has passed through said motor, through the condenser, flow-restricting device 75

and evaporator and then exhausting said latter gas from said circuit.

2. The method of dehydrating refrigeration apparatus before it is charged with a refrigerant, which refrigeration apparatus includes a motor, a compressor, a condenser, an evaporator, a flow-restricting device disposed between the condenser and evaporator and passages connecting said parts and forming therewith a circuit for the flow of gas, which method comprises passing gas first through said motor, then through the compressor, exhausting a portion of the gas which has passed through said motor and compressor exteriorly of said circuit before it enters the condenser or evaporator, passing another portion of said gas, which has passed through said motor and compressor, through the condenser, flow-restricting device and evaporator and then exhausting said latter gas from said circuit.

3. The method of dehydrating refrigeration apparatus before it is charged with a refrigerant, which refrigeration apparatus includes a motor, a compressor, a condenser, an evaporator, a flow-restricting device disposed between the condenser and evaporator and passages connecting said parts and forming therewith a circuit for the flow of gas, which method comprises disposing the unit in a heated chamber, passing gas first through said motor, exhausting a portion of the gas which has passed through said motor exteriorly of the circuit before it enters the condenser or evaporator and passing another portion of said gas, which has passed through said motor, through the condenser, flow-restricting device and evaporator and then exhausting said latter gas from said circuit.

4. The method of dehydrating refrigeration apparatus before it is charged with a refrigerant, which refrigeration apparatus includes a motor, a compressor, a sealed casing for enclosing the motor and compressor, a condenser, an evaporator, a flow-restricting device disposed between the condenser and evaporator and passages connecting said parts and forming therewith a circuit for the flow of gas, which method comprises passing gas through said hermetically-sealed casing to dry the motor and compressor, exhausting a portion of the gas which has passed through said sealed casing exteriorly of said circuit before it enters the condenser or evaporator, passing another portion of said gas, which has passed through said sealed casing, through the condenser, flow-restricting device and evaporator and then exhausting said latter gas from said circuit.

5. The method of dehydrating a plurality of complete refrigerating systems before charging with refrigerant, each of said systems including a motor, a compressor, a condenser, an evaporator, a flow-restricting device between the condenser and the evaporator and passages connecting said parts and forming therewith a circuit for the flow of gas, which method comprises connecting said plurality of systems in series by conduit connections, passing gas first through the motor of the first refrigerating system, conveying a portion of the gas which has passed through said motor to the next refrigerating system in the series before said gas enters the condenser or evaporator of the first refrigerating system in the series, passing another portion of the gas, which has passed through the motor, through the condenser, flow-restricting device and evaporator of the first system, and exhausting said

latter gas exteriorly of the gas circuit of the respective systems in said series.

6. The method of dehydrating a plurality of complete refrigerating systems before charging with refrigerant, each of said systems including a motor, a compressor, a condenser, an evaporator, a flow-restricting device between the condenser and the evaporator and passages connecting said parts and forming therewith a circuit for the flow of gas, which method comprises disposing the systems in a heated chamber, connecting said plurality of systems in series by conduit connections, passing gas first through the motor of the first refrigerating system, conveying a portion of the gas which has passed through said motor to the next refrigerating system in the series before said gas enters the condenser or evaporator of the first refrigerating system in the series, passing another portion of the gas, which has passed through the motor, through the condenser, flow-restricting device and evaporator of the first system, exhausting said latter gas from said circuit exteriorly of the systems and repeating the aforesaid steps for each system in said series with the gas conveyed thereto from the prior system in the series.

7. The method of dehydrating a plurality of complete refrigerating systems before charging with refrigerant, each of said systems including a motor, a compressor, a hermetically-sealed casing enclosing the motor and compressor, a condenser, an evaporator, a flow-restricting device between the condenser and evaporator and passages connecting said parts and forming therewith a circuit for the flow of gas, which method comprises connecting said plurality of systems in series by conduit connections, passing gas first through the hermetically-sealed casing of the

first refrigerating system to dry the motor and compressor contained therein, conveying a portion of the gas which has passed through said sealed casing to the next refrigerating system in the series before said gas enters the condenser or evaporator of the first refrigerating system in the series, passing another portion of the gas, which has passed through the sealed casing, through the condenser, flow-restricting device and evaporator of the first system, exhausting said latter gas from said circuit exteriorly of the respective systems and repeating the aforesaid steps for each system in said series with the gas conveyed thereto from the prior system of the series.

8. The method of dehydrating a plurality of complete refrigerating systems before charging with refrigerant, each of said systems including a motor, a compressor, a condenser, an evaporator, a flow-restricting device between the condenser and evaporator and passages connecting said parts and forming therewith a circuit for the flow of gas, which method comprises connecting said plurality of systems in series by conduit connections, passing gas first through the motor of the first refrigerating system, conveying a portion of the gas which has passed through said motor to the next refrigerating system in the series before said gas enters the condenser or evaporator of the first refrigerating system in the series, passing another portion of the gas, which has passed through the motor, through the condenser, flow-restricting device and evaporator of the first system, exhausting said latter gas from said circuit exteriorly of the systems and repeating the aforesaid steps for each system in said series with the gas conveyed thereto from the prior system in the series.

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