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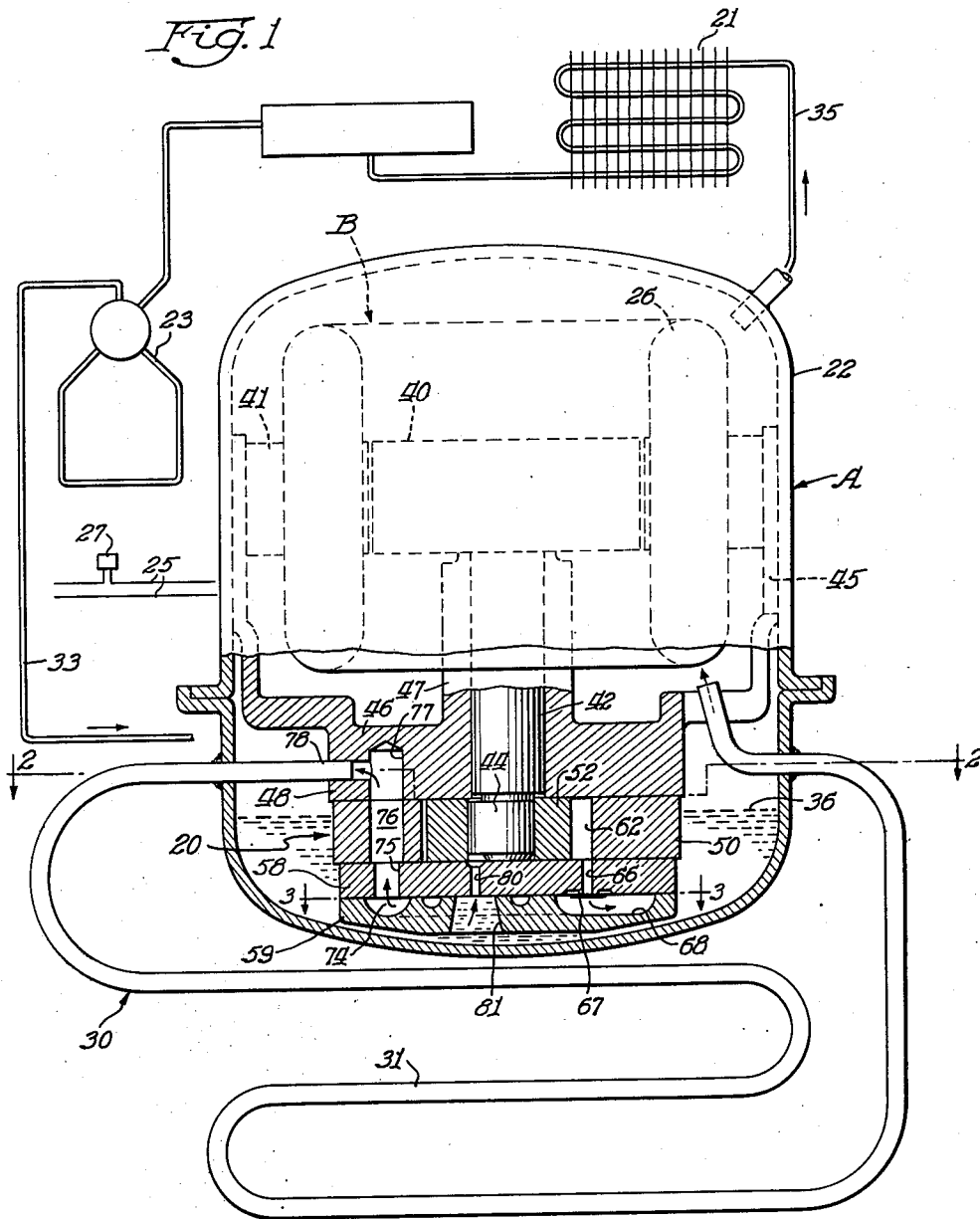
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2,597,243

REFRIGERATOR COMPRESSOR COOLING ARRANGEMENT

Filed Feb. 25, 1949

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

Fig. 2

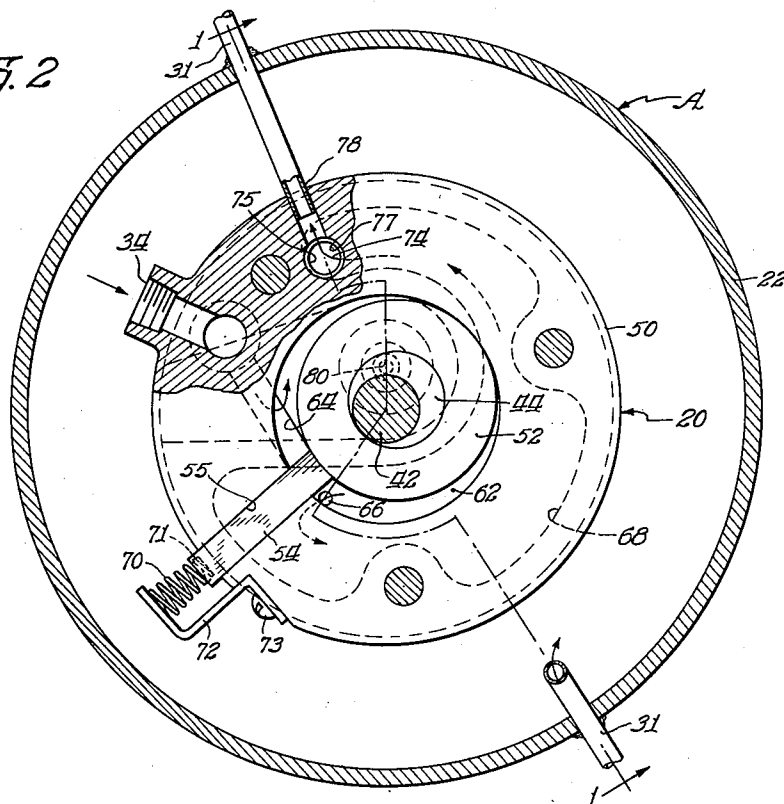


Fig. 4

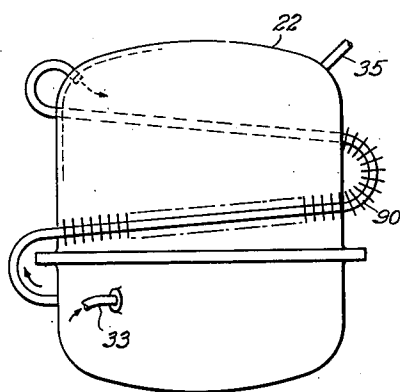
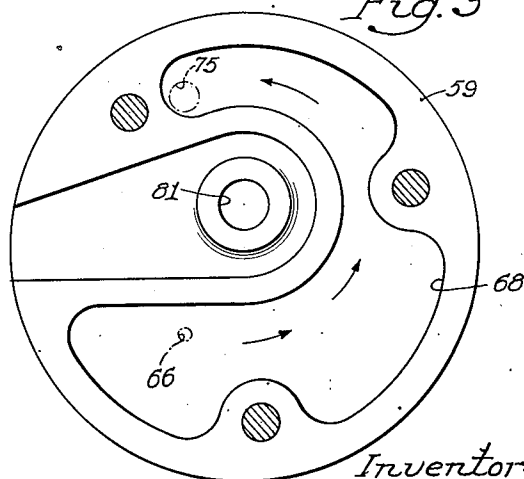


Fig. 3



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REFRIGERATOR COMPRESSOR COOLING
ARRANGEMENT

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This invention relates in general to refrigerating apparatus and has reference to an improved form of compressor construction which is particularly adapted for employment in refrigerating systems of the type wherein a refrigerating medium is circulated through a closed system and is successively compressed in a gaseous state, condensed into a liquid and then expanded by evaporation at a relatively high pressure, the compressor of the present invention being particularly characterized by the provision of an effective refrigerant cooling arrangement directly and operatively associated with the compressor proper.

Heretofore, in prior art refrigerator compressors of this general class, difficulties have been encountered in providing a means for preventing super-heated refrigerant flowing into the top dome of the refrigerator compressor from causing damage to the compressor motor windings and other parts thereof because of the relatively high temperatures of the refrigerant, the temperature of the refrigerant in such cases being substantially higher than the normal operating temperature of the motor, thereby causing overheating of the motor which results in undue wear or possibly premature failure of the motor.

It is recognized that in the prior art numerous attempts have been made to provide a refrigerant cooling arrangement of this general class, but to the best of the applicant's knowledge, only very few of the prior art structures have had limited successful applications and have been accorded only limited commercial recognition. It is believed that this fact results from the deficiencies of the prior art structure, and their non-adaptability to effectively overcome the difficulties hereinbefore set forth.

For example, some prior art structures have provided a closed system which calls for successively compressing the refrigerant, cooling the refrigerant by causing it to make several passes through the conventional condenser disposed remotely of the compressor, returning the refrigerant to the compressor and then returning it to the condenser to continue through the remainder of the refrigerating system, this arrangement necessitating several conduit connections between the compressor and condenser, which connections have been found particularly objectionable and subject to premature leakings of the connecting tubes due to normal vibrations set up between the compressor and condenser during operation of the motor.

The present improvements in refrigerator compressor constructions, particularly the refrig-

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erant cooling arrangement contemplated herein, is directed to simplify the structural features thereof and their mode of operation while providing for an effective arrangement to cause a drop in the temperature of the refrigerant before its introduction into contact with associated parts of the compressor motor which arrangement will overcome the deficiencies presently found in prior art structures.

It is, therefore, a particular object and accomplishment of the invention to provide a refrigerant cooling device directly associated with the compressor and which is arranged to receive the refrigerant from the compressor in a first phase of operation wherein there are employed principles of operation whereby the super-heat of the refrigerant gas is unloaded in the ambient outside the compressor proper by means of a cooling coil, the unloading of the super-heat of the refrigerant to the air in this manner offering the advantage of not adding unnecessary heat to the motor, thereby permitting the motor to run cooler, and as a second phase in the operation of the subject device, the cooling coil is designed so that a small portion of the refrigerant is caused to condensate and the heat required to boil this liquid upon its re-entry into the compressor dome will further reduce the operating temperature of the motor compressor unit, thereby to provide some reduction in head pressure, improved torque speed performance of the motor and improved operating efficiency of the motor.

A further object and accomplishment of the invention is to provide a refrigerant cooling device, directly associated with the compressor, the cooling device comprising a coil arranged to open from the discharge chamber of the compressor and to discharge the refrigerant into the dome of the compressor, the connection of the coil from the discharge chamber being immersed below the level of the oil disposed in the compressor, thereby employing the use of the heat of super-heat caused by compression of the refrigerant to heat up the coil and maintain the solution of Freon in oil at a given pressure as low as possible.

Another object and accomplishment of the invention is to provide an improved refrigerating system by co-relating and especially designing the various elements of such systems and whereby there shall be such cooperation between said improved elements as will best serve the purpose of providing an efficient system capable of being manufactured at low cost and yet giving maximum of satisfactory service in use.

The invention seeks, as a further object and accomplishment, to provide a refrigerator compressor having incorporated therein a refrigerant cooling device as contemplated herein and characterized by an arrangement of parts to more advantageously and satisfactorily perform the functions required of it and adapted to provide a compact unit which will successfully combine the factors of structural simplicity and durability, and yet be economical to manufacture.

Additional objects, features and advantages of the invention disclosed herein will be apparent to persons skilled in the art after the construction and operation are understood from the within description.

With these objects in view, together with others which will appear as the description proceeds, the invention resides in the novel construction, the combination of parts and the arrangement thereof for cooperative effort to more efficiently perform the functions required, as illustrated in the drawing and which will be more fully described hereinafter, and as more particularly pointed out in the appended claims, reference being had to the accompanying drawing which forms a part of this specification, wherein:

Fig. 1 is a side elevational view of a compressor having incorporated therein the refrigerant cooling device embodying the features of the invention, portions of said compressor being shown in section to more clearly illustrate the construction thereof, and a refrigerating system with which the compressor and refrigerant cooling arrangement is diagrammatically illustrated;

Fig. 2 is a sectional view of the compressor taken substantially on the plane of the line 2—2 in Fig. 1;

Fig. 3 is a top plan view of the bottom plate of the compressor assembly and taken substantially on the plane of the line 3—3 in Fig. 1; and

Fig. 4 is a side elevational view of a modified arrangement of the cooling coil contemplated herein.

The drawings are to be understood as being more or less of a schematic character for the purpose of illustrating or disclosing typical or preferred forms of the improvements contemplated herein.

Referring to the drawing, particularly Fig. 1, there is illustrated, partially in section, a sealed motor compressor unit designated in its entirety by the letter A and including a refrigerant compressor or pump indicated generally at 20.

The sealed motor compressor unit A may comprise a part of a refrigerating system of the compressor-condenser-expander type, such as diagrammatically illustrated in Fig. 1, and wherein the refrigerant is circulated by means of the compressor or pump 20 through a condenser 21 for extracting or dissipating heat from the refrigerant medium and thence to a freezer or evaporator 23 in which the refrigerant medium is expanded or vaporized for absorbing heat and the refrigerant medium is thereafter returned to the compressor whence the cycle is repeated.

Suffice it to say, since the invention is not particularly concerned with the precise construction of the complete refrigerating system and/or its associated parts, they will not be further described in detail and it is deemed sufficient for all intentions and purposes herein contained to show only portions thereof adjacent to and co-

operating with the compressor 20 and the refrigerant cooling device incorporated therewith and with which the invention is particularly concerned. It is to be understood that details of construction of such refrigerating systems and their associated parts may be modified to suit particular conditions or to satisfy the engineering genius of various competitive manufacturers and we do not wish to be limited to the construction of these elements as set forth, except where such construction particularly concerns the invention contemplated herein.

Having thus described by way of example, a possible adaptation of the sealed motor compressor unit having incorporated therein a refrigerant cooling device, and having described the general environment surrounding the adaptation, the specific construction and function of the parts of said sealed motor compressor unit and the refrigerant cooling device contemplated herein will now be described in detail.

In general, it may be stated, that the refrigerant cooling device designated in its entirety by the numeral 30 and with which the present invention is particularly concerned, is directly associated with the compressor 20 and which is arranged to receive the refrigerant directly from the compressor in a first phase of operation wherein there are employed principles of operation whereby the super-heat of the refrigerant gas is unloaded in the ambient outside the compressor proper by means of the cooling coil 31, the unloading of the super-heat of the refrigerant to the air in this manner offering the advantage of not adding unnecessary heat to the motor designated in its entirety by the letter B, thereby permitting the motor B to run cooler, and as a second phase in the operation of the subject device, the cooling coil 31 is designed so that a small portion of the refrigerant contained therein is changed to condensate and the heat required to boil this liquid upon its re-entry into the compressor dome as illustrated in Fig. 1 and which will be more fully described hereinafter, will further reduce the operating temperature of the motor compressor unit, thereby to provide reduction in head pressure, improved torque feed performance of the motor and improved operating efficiency of the motor.

In the exemplary embodiment of the invention depicted in Fig. 1, the compressor 20 is shown as being enclosed within a gastight housing or casing indicated generally at 22 and the electric motor B is illustrated as being disposed within the casing 22 for operating the compressor 20. The motor B preferably is of the alternating current type and adapted to be supplied with electric energy through suitable conduits 25 operatively connected to the motor windings indicated generally at 26 and which are arranged internally of the casing 22. Current may be supplied intermittently to the motor for operating the same at intermittent periods and the supply of current to the motor may be under the control of a switch 27 which is operatively associated with the evaporator or freezer element 23 of the refrigerating system so that the compressor may be operated in such a manner as to maintain the temperature thereof and of the heat insulated compartment within such evaporator may be arranged, within said predetermined temperature limits.

In the construction illustrated in Figs. 1 and 2, the compressor 20 is arranged within the gastight casing 22 and vaporous refrigerant from the evaporator is supplied to the intake side of the

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compressor 20 through the suction line 33 which is connected to the port 34 (Fig. 2). The refrigerant is discharged from the compressor 20 into the cooling device 30 and thereafter is discharged into the dome of the compressor as illustrated in Fig. 1 and the refrigerant is conducted from the dome of the compressor to the condenser 21 by means of the conduit 35. The lower portions of the casing 22 function as a lubricant reservoir and the lubricant therein, which preferably stands to a level indicated by the line 36 in Fig. 1, is subjected to the discharge pressure of the compressor. As a refrigerant medium is supplied to the evaporator element 23 under control of a suitable refrigerant expansion control, the space within the casing 22 and the condenser 21 constitute the high pressure side of the refrigerating system.

A lubricant is provided for lubricating the working parts of the system such as, for example, the moving parts of the compressor 20 and the motor, and some of this lubricant will circulate with the refrigerant throughout the system; however, a body of lubricant will collect within the lower part of the casing 22 and to such an extent as to partially submerge the compressor 20 therein. As the lubricant in the casing is subjected to the discharge pressure of the compressor and as the compressor is partially submerged in the lubricant, the working parts of the compressor will be lubricated and sealed.

The motor B includes a rotor 40 and a stator 41, including the motor windings 26. The rotor 40 of the motor is affixed to the upper end of a shaft 42 for driving the same.

The rotor 40 may be of conventional construction and comprise a stack of circular laminations suitably secured together by any approved practice and press fitted or otherwise suitably secured to the upper portions of the shaft 42 for advantageous rotation therewith.

In accordance with the construction of the present invention, the stator 41 comprises a stack of annular laminations made of iron or any other suitable metallic material. The motor windings 26 may be secured in the conventional manner to the stator 41 as illustrated in Fig. 1 of the drawings. The outer peripheral surface of the stator may be secured to a sleeve 45 of a frame comprising a bearing plate 46, the frame being preferably supported within the casing 22 and above the bottom thereof, the sleeve portion 45 preferably being pressed into the shell or dome of the casing 22 as illustrated, the periphery of the sleeve 45 being arranged so that the axis of the bearing 47 coincides with the axis of the sleeve 45. It is notable that the bearing plate is substantially circular and includes an axially extending projection which forms the bearing 47 for the shaft 42.

The other end of the shaft 42 is provided with an eccentric element 44 adapted to form a part of the compressor 20. The bearing plate 46 is provided with a projection on the under side thereof, which forms an end plate 48 of a rotary compressor which includes a cylinder 50, a rotor 52, a divider 54 and the eccentric element 44, an end plate 58, and a bottom plate 59 arranged with channels as illustrated to distribute the compressed refrigerant. The end plates 48 and 58 and the cylinder 50 are rigidly assembled together in such a manner as to form a closed cylindrical chamber 62 in which the rotor 52 is arranged for oscillation. The rotor 52 is freely journaled on the eccentric element 44 and, it

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will be observed, is of less diameter than the cylindrical pumping chamber 62 in which it is arranged. The rotor 52 is of such size, relative to the cylinder 50, that there is a small working clearance between the vertical faces of the rotor and the adjacent vertical faces of the end plates 48 and 58. Also, the diameter of the rotor 52 is such that there is a slight clearance between the periphery of the rotor 52 and the adjacent cylindrical wall of the cylindrical pumping chamber 62 at that point where the rotor 52 divides one size of the pumping chamber 62 from the other side thereof, as illustrated in Fig. 2, and this clearance is maintained as the rotor gyrates or moves around the cylindrical pumping chamber 62 in a clockwise direction, looking at Fig. 2.

The divider 54 is arranged for reciprocation within a slot 55 formed in the cylinder 50 and is disposed so that end portions thereof are in engagement with the periphery of the rotor, as illustrated in Fig. 2, so as to separate the suction gas from the discharge gas in the pumping chamber 62. The divider 54 defines flat surfaces which slide on the flat surfaces of the slot in which the divider 54 reciprocates. The divider 54 preferably is of the same dimension, with respect to thickness, as the rotor 52, so that the divider 54 will form a moving seal between the periphery of the rotor 52 and the walls of the pumping chamber 62.

The pumping chamber 62 is provided with an intake port as at 64 and with a discharge port 66 preferably, but not necessarily, controlled by a valve as at 67 (Fig. 1).

The divider 54 is reciprocal in the slot 55 and is guided in its movement by a spring 70, one end of which being received into a recess 71 disposed in the end portions of the divider 54 and the other end being held in operative position by a bracket 72 secured in operative position to the outside of the cylinder by screw means 73. Spring 70 acts to hold the divider 54 in contact with the periphery of the rotor 52.

The discharge port 66, opens into a channel 68 of the bottom plate 59 in which the valve 67, which controls the discharge port is arranged. The valve 67 may be a flap valve or a check valve and is preferably anchored at one end thereof by suitable screw means to the under side of the end plate 58.

In referring to the Figs. 1, 2 and 3, particularly to the construction of the bottom plate 59, it will be found that the refrigerant after being discharged through the port 66 into the channel 68, may follow the semi-circular path of the channel 68 as disclosed in Fig. 3 and the refrigerant gas thereafter will follow the path defined by the arrow 74 (Fig. 1) to be conducted through the passage 75 disposed in the end plate 58 and the passage 76 disposed in the cylinder 50 and the passage 77 disposed in the bearing plate 48. In Fig. 2 it can be seen that the chamber 74 is provided with connecting means 78 arranged to receive the end portions of the cooling device 30.

When the refrigerant enters into the cooling device it normally is of high temperature particularly where a relatively high pressure compressor is employed, and as the refrigerant gas flows through the conduit 31 which is disposed outwardly of the compressor casing 22 and exposed to the ambient, the refrigerant is cooled to an extent where the objectionable high temperature is eliminated.

It is notable that the conduit 31 of the cooling

device 30 may take any convenient form and may be of any length sufficient for the purposes intended. In some adaptations it may be preferable to merely employ a conduit as shown in Fig. 1 while in other adaptations, in order to obtain more cooling surfaces, it may be advantageous to secure fins to the conduit 31 which obviously will present more surface area to the ambient and effect an even greater reduction in the temperature.

In this connection the unloading of the superheat of the refrigerant gas in the ambient outside the compressor proper by means of the cooling coil 30 offers the advantage of not adding unnecessary heat to the motor, thereby permitting the motor to run cooler.

After the refrigerant has passed through the cooling coil it is deposited into the dome portions of the casing 22 as illustrated in Fig. 1, the refrigerant gas under pressure will reflect upon the lubricant disposed in the lower portions of the casing 22, which pressures will force the lubricant into contact with the working parts of the compressor through the medium of the channel 80 (Fig. 1) which opens from a recess 81 of the bottom plate 59 and discharges into the cylindrical chamber 62 adjacent the eccentric element 44. Thus, it will be seen that lubricant is supplied to the shaft 42 and to the eccentric element 44 for lubricating the same. Also, the lubricant which is supplied to the chamber 62 functions to seal the clearance between the rotor 52 and the end plates 48 and 58. During the operation of the compressor, some lubricant will be drawn through the clearance between the sides of the rotor 52 and the end plates into the chamber 62 on the intake side thereof. Such lubricant, together with the lubricant entrained in the suction gas supplied by the conduit 33 and the lubricant which is forced by the high pressure past the divider 54 will be swept around the chamber 62 by gyration of the rotor 52 and serve to seal the clearance between the rotor 52 and the internal wall of the cylinder 50 as well as to seal the clearance between the ends of the divider 54 and the adjacent end plates. Most of the lubricant which enters the pumping chamber 62 will be discharged along with the compressed gas during the operation of the compressor, but sufficient amounts will remain for the purpose of lubricating and sealing the moving parts of the compressor.

The refrigerant in the casing 22 will be in a gaseous form except for a very slight amount which might be absorbed in the lubricant; however, during the operation of the compressor, the heat of the same, together with the pressure prevailing within the casing 22, will serve to keep the lubricant reasonably free of refrigerant. In this manner the lubricant which is supplied to the working parts of the compressor will be substantially free of refrigerant.

In Fig. 4, there is illustrated a modified form of the refrigerant cooling device, the only difference in construction and operation being that the coil 90 is wound around the casing 22 in order to conserve space. Instead of discharging the refrigerant gas into the dome as illustrated in Fig. 1, the end portions of the conduit 90, as illustrated in Fig. 4, are connected to the upper portions of the dome and the refrigerant is thus discharged into the interior of the casing 22.

Again it may be stated that the conduit 90 may define a simple circular construction and if desired fins may be added in order to increase the exposed surface areas. In all other respects the

construction disclosed in Fig. 4 operates in the same manner as hereinbefore described with respect to the disclosure illustrated in Figs. 1 and 2.

The cooling coils are designed so that a small portion of the refrigerant contained therein is changed to condensate and the heat required to boil this liquid upon its re-entry into the compressor dome will further reduce the operating temperature of the motor compressor unit, thereby to provide reduction in head pressure, improved torque speed performance of the motor and improved operating efficiency.

From the foregoing disclosure, it may be observed that we have provided an improved motor compressor assembly for refrigerating systems, said motor compressor assembly having incorporated therein a refrigerant cooling device directly and operatively associated with the motor compressor unit, the constructions disclosed effectively fulfilling the objects thereof as hereinbefore set forth and which constructions provide numerous advantages which may be summarized as follows:

1. Structurally simple, efficient and durable;
2. Economical to manufacture and readily adaptable to mass production manufacturing principles; and
3. The provision of a motor compressor unit having incorporated therewith a refrigerant cooling device arranged to cause a substantial reduction in operating temperature of the motor compressor unit thereby permitting the motor to run cooler and providing an improved operating efficiency of the motor.

While we have illustrated preferred embodiments of our invention, many modifications may be made without departing from the spirit of our invention, and we do not wish to be limited to the precise details of construction set forth, but wish to avail ourselves of all changes within the scope of the appended claims.

We claim:

1. A refrigeration system comprising, a compressor motor combination unit within a single casing arranged to receive refrigerant and having a lubricant reservoir, said compressor unit having a vertical channel extending from its compression chamber to the reservoir, an evaporator having its suction side directly connected to the inlet port of said compressor, a finned preliminary refrigerant cooling coil arranged exteriorly of the casing in encircling relationship with the casing and having its inlet connected directly to the outlet of the compressor, whereby the super-heated and compressed gas and entrained oil are carried away from the compressor without said gas and oil passing through the casing, the outlet of said preliminary cooling coil being connected to the top of the casing, said preliminary cooling coil having a predetermined heat exchange area to condense partially the refrigerant vapor whereupon the partially condensed refrigerant and the entrained oil will run down on the motor parts inside the casing effecting a cooling of said motor parts with a resultant reevaporization of the refrigerant in that portion of the casing enclosing the motor and also effecting a forced lubrication of said compressor through said vertical channel by pressure, the oil collecting in the lubricant reservoir in the lower part of the casing to separate the oil from the refrigerant, a main condenser separate and removed from said preliminary cooling coil and having a predetermined heat exchange area to cool and liquify the liquid vapor

received from the casing, and conduit means connecting the upper part of said casing with said main condenser and conduit means connecting said main condenser with the evaporator.

2. In a refrigeration system comprising a compressor motor combination unit within a single casing arranged to receive refrigerant and having a lubricant reservoir, said compressor unit having a straight vertical channel medium from the compression chamber to said reservoir, evaporator means having its suction side directly connected to the inlet port of said compressor, and a main condenser having a predetermined heat exchange area to cool and liquify the liquid vapor received from the casing, said main condenser being interconnected with the upper part of said casing by conduit means, and said main condenser being connected with said evaporator by conduit means, the combination with said compressor motor combination unit of a finned preliminary refrigerant cooling coil arranged exteriorly of the casing separate and removed from said main condenser and having its inlet connected directly to the outlet of the compressor, whereby the super-heated and compressed gas is carried away from the compressor without said gas passing through the casing, the outlet of said preliminary cooling coil being connected to the casing, said preliminary cooling coil having a predetermined heat exchange area to condense partially the compressed refrigerant vapor whereupon the partially compressed condensed refrigerant and the entrained oil coming into contact with the motor parts inside the casing effect a cooling of said motor with a resultant revaporization of the refrigerant in that portion of the casing enclosing the motor and also effecting a forced lubrication of said compressor through said reservoir and channel medium and with the oil collecting in the lubricant reservoir in the lower part of the casing to separate the oil from the refrigerant.

3. A refrigerating apparatus comprising a compressor motor combination unit within a single casing having a lubricant reservoir, said compressor unit having a vertical channel medium extending into said lubricant reservoir to allow the working parts of said compressor to be lubricated, a preliminary refrigerant cooling coil, a main condenser, and an evaporator connected in a closed cyclic path in the order named, a charge of refrigerant and lubricating oil in the apparatus, a greater portion of said oil being disposed in said reservoir, and said preliminary refrigerant cooling coil being arranged exteriorly of the casing separate and removed from said main condenser and having its inlet connected directly to the outlet of the compressor, whereby the super-heated compressed gas and entrained lubricating oil are carried away from the compressor without said gas passing through the casing, the outlet of said preliminary cooling coil being connected to the casing, said preliminary cooling coil having a predetermined heat exchange area to condense partially the refrigerant vapor whereupon the compressed partially condensed refrigerant and the entrained oil coming into contact with the motor parts inside the casing to effect a cooling of said motor with a resultant revaporization of the refrigerant in that portion of the casing enclosing the motor said compressed gas in said casing constituting a pressure area to force the oil in the reservoir through said channel medium facilitating lubrication of the compressor and with the oil collecting in

the lubricant reservoir in the lower part of the casing to separate the oil from the refrigerant.

4. In a refrigeration system comprising a compressor motor combination unit with a single casing arranged to receive refrigerant and having a lubricant reservoir, said compressor unit having a vertical channel medium extending into said lubricant reservoir to allow the working parts of said compressor to be lubricated, a charge of refrigerant and oil in said system, evaporator means having its suction side directly connected to the inlet port of said compressor, and a main condenser having a predetermined heat exchange area to cool and liquefy the liquid vapor received from the casing, said main condenser being interconnected with the upper part of the casing by conduit means, and said main condenser being connected with said evaporator by conduit means, the combination with said compressor motor combination unit of a finned preliminary refrigerant cooling coil arranged exteriorly of the casing separate and removed from said main condenser and having its inlet connected directly to the outlet of the compressor, whereby the superheat compressed gas is carried away from the compressor without said gas passing through the casing, the outlet of said preliminary cooling coil being connected to the casing, said preliminary cooling coil having a predetermined heat exchange area to condense partially the compressed refrigerant vapor whereupon the partially compressed condensed refrigerant and entrained oil passing from said preliminary cooling coil into said casing coming into contact with the motor parts effect a cooling of said motor in that portion of the casing enclosing the motor by a resultant revaporization of the refrigerant, the entrained oil separating and collecting in the lubricant reservoir thereby lubricating the motor, and the gas exerting a pressure on the oil in the reservoir characterizing a forced lubrication of the compressor parts through the vertical channel medium.

5. In a refrigeration system having a compressor motor combination unit within a single casing arranged to receive refrigerant and having a lubricant reservoir, a charge of refrigerant and oil within said system, said compressor including means defining a housing formed with a cylinder therein, a drive shaft having an eccentric element within the cylinder, a hollow rotor operatively associated with the eccentric element and freely journaled on said eccentric element, said cylinder having a slot in the wall thereof, a divider reciprocal at said slot and engageable with said rotor, said cylinder having an intake port on one side of said divider and a discharge port on the other side of said divider, channel means related to the discharge port for conveying the compressed refrigerant and entrained oil, a second channel means extending from said cylinder to said reservoir, a finned refrigerant cooling device connected with said first mentioned channel means and arranged to receive the discharge refrigerant and entrained oil from the compressor to expose the same to the ambient outside the confines of the casing to effect a reduction in the temperature of the refrigerant and partially condense same, said refrigerant cooling device having discharge end portions opening thereof into the casing and arranged to dispose the partially condensed refrigerant and entrained oil into the upper portions of the casing, the disposition of said partially condensed refrigerant and entrained oil

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coming into contact with the motor parts and achieving a cooling of said motor by a resultant revaporation of the refrigerant, achieving a lubrication of the motor parts, and achieving a forced lubrication of said compressor through said channel means by a pressure exerted on the oil disposed in the reservoir.

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