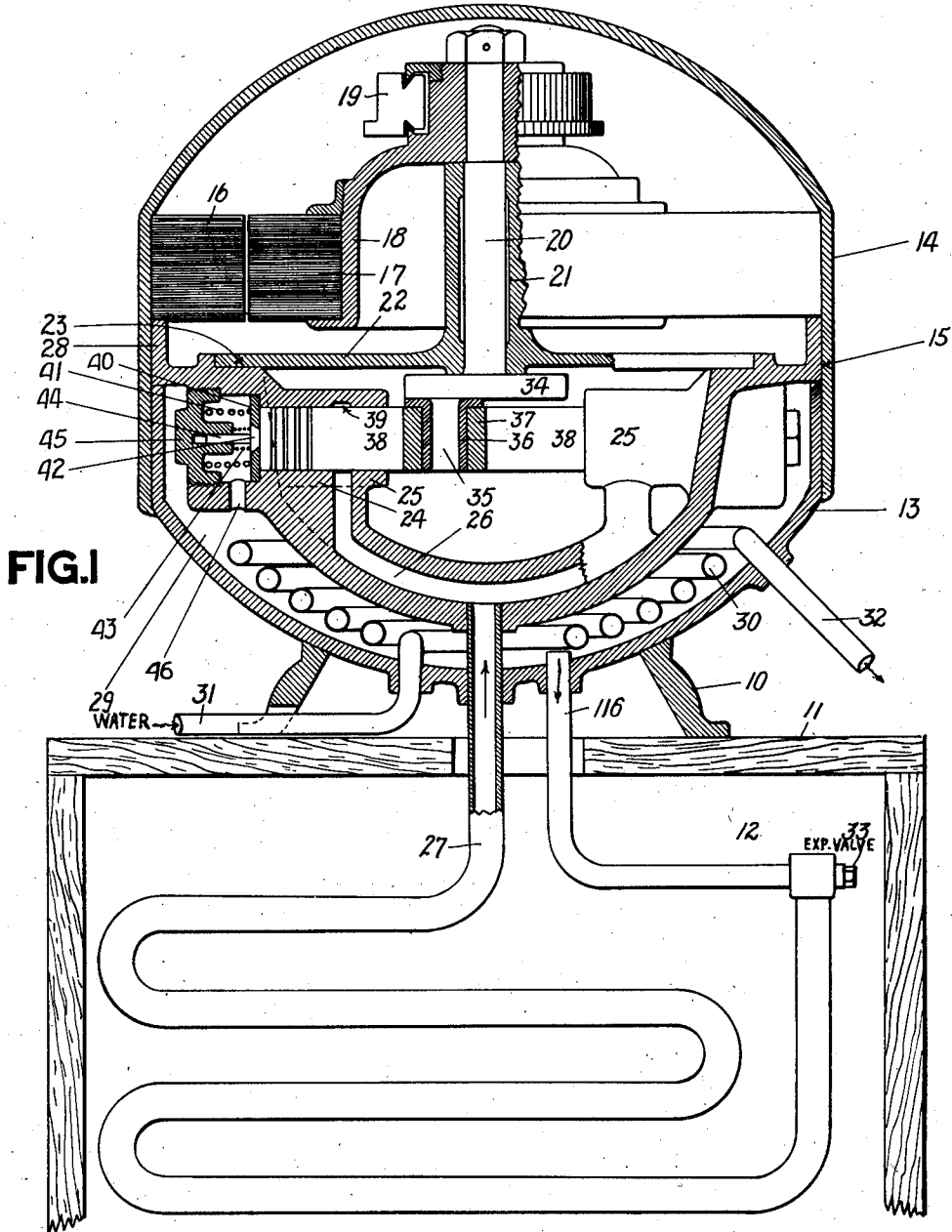


D. H. STOKES.
REFRIGERATING APPARATUS.
APPLICATION FILED JULY 7, 1916.

1,362,757.

Patented Dec. 21, 1920.
4 SHEETS—SHEET 1.



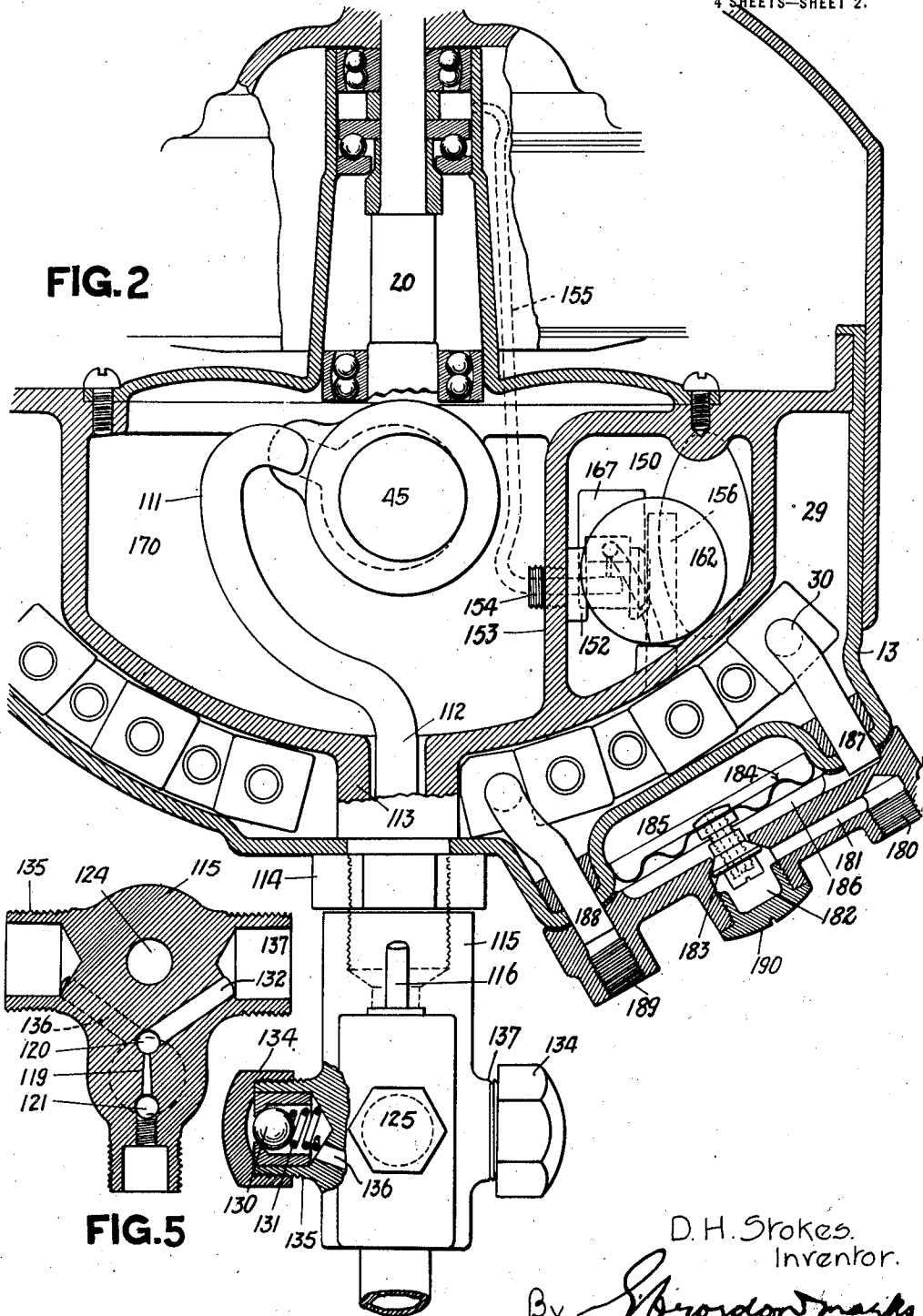
D. H. Stokes.
Inventor.
By *E. Crockett*
Attorney.

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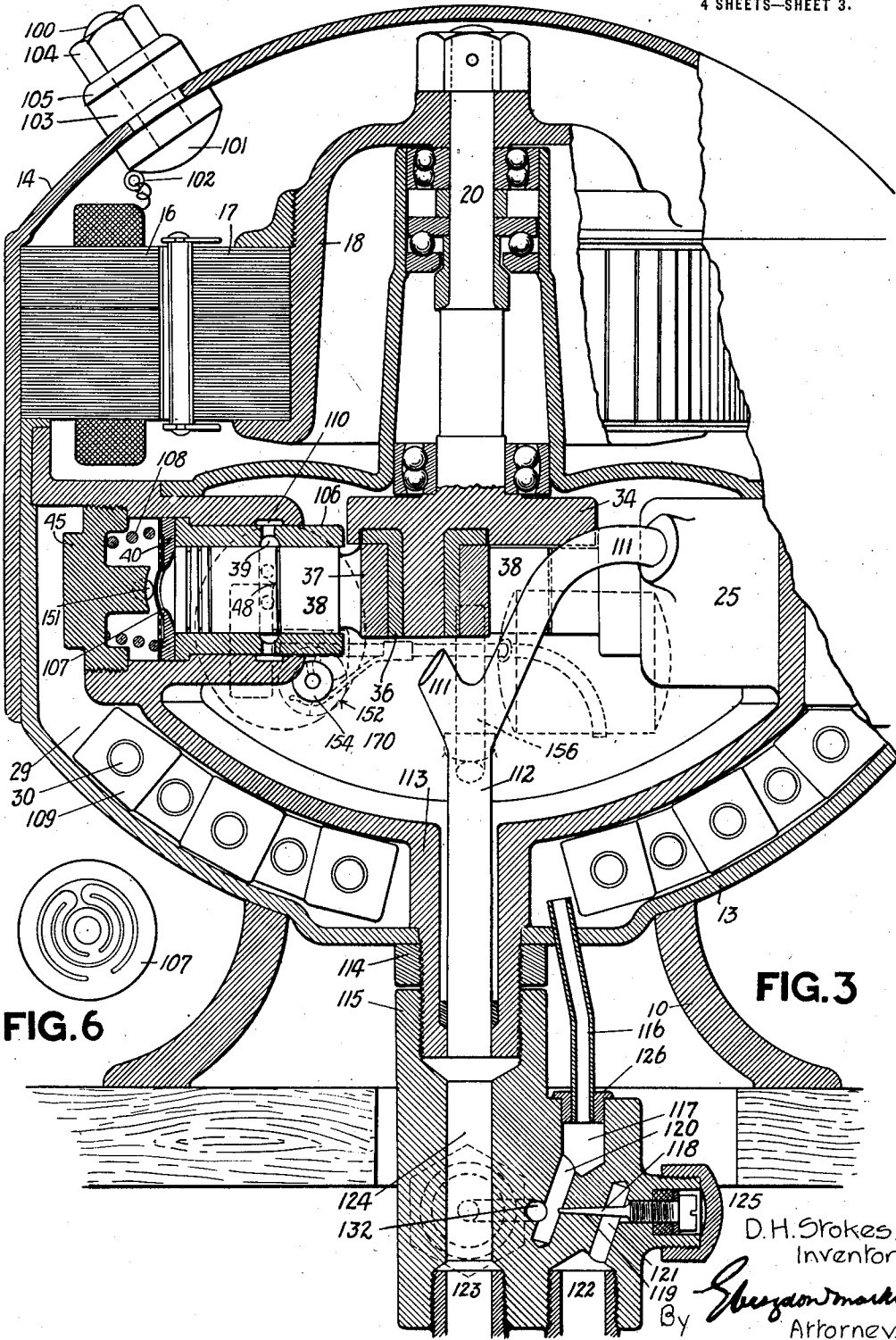
D. H. Stokes.
Inventor.
By *J. Brodson Marks*
Attorney.

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4 SHEETS—SHEET 4.

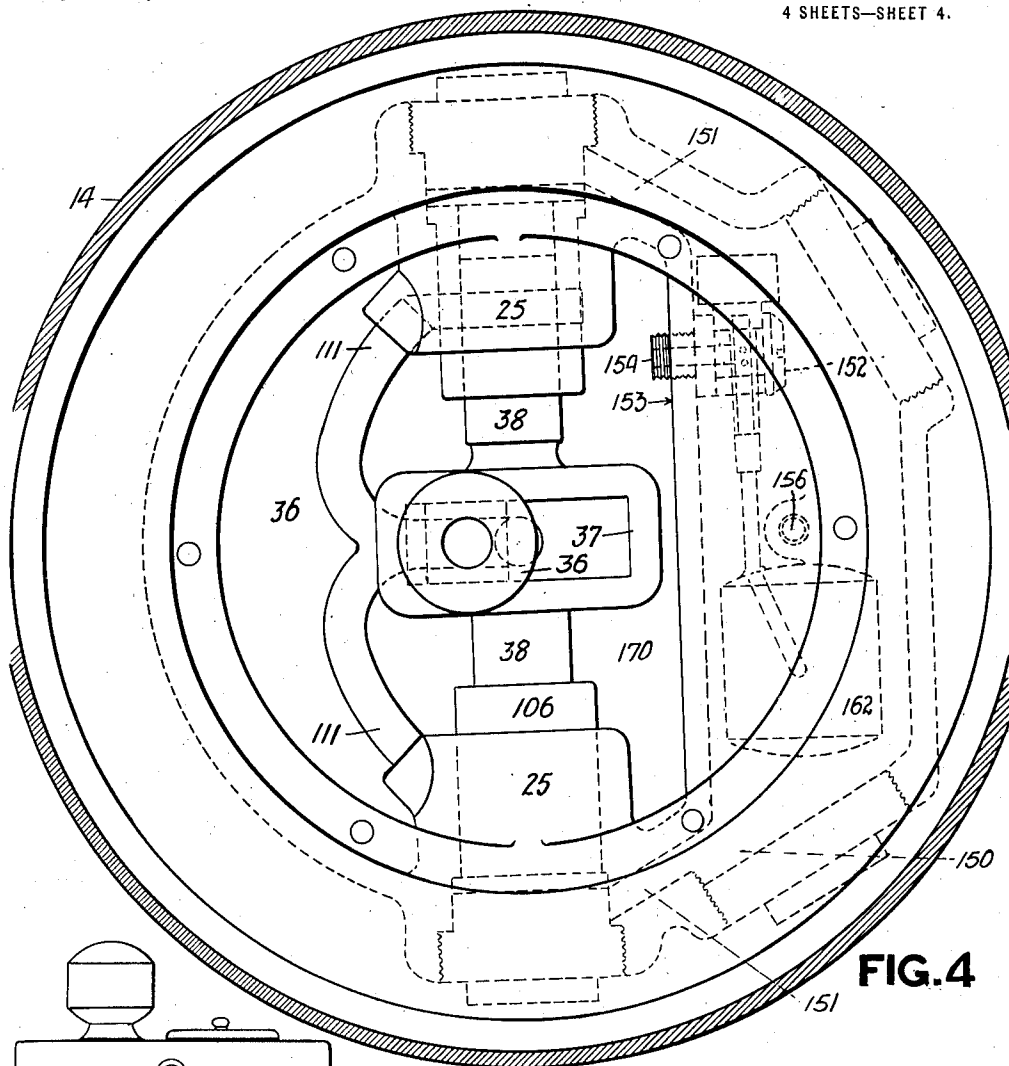


FIG. 4

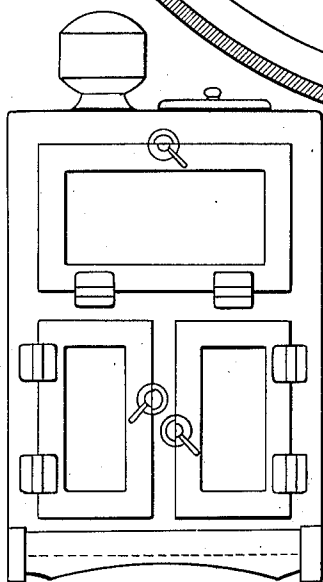


FIG. 8

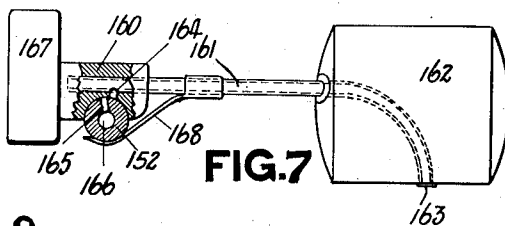


FIG. 7

D. H. Stokes.
Inventor.

By *E. J. Brown & Marks*
Attorney.

UNITED STATES PATENT OFFICE.

DOUGLAS HENRY STOKES, OF CREMORNE, NEAR SYDNEY, NEW SOUTH WALES,
AUSTRALIA.

REFRIGERATING APPARATUS.

1,362,757.

Specification of Letters Patent.

Patented Dec. 21, 1920.

Application filed July 7, 1916. Serial No. 107,961.

To all whom it may concern:

Be it known that I, DOUGLAS HENRY STOKES, subject of the King of Great Britain and Ireland, residing at Murdoch street, Cremorne, near Sydney, New South Wales, Australia, have invented certain new and useful Improvements in Refrigerating Apparatus of which the following is a specification.

10 This invention relates to refrigerating machines of small capacity adapted to be used in connection with cold storage chambers of limited volume and suitable for the production of limited quantities of ice. The
15 object of the invention is to provide a completely inclosed electrically driven machine of simple and effective mechanical construction and small capacity, and without any externally moving parts or accessories, assuring reasonable efficiency and low cost of manufacture.

The machine is designed for operating with ammonia or other vaporizable liquid of high latent heat, on the usual compressing-condensing-expanding cycle. The motor, the compressor, and the cooler are contained in an hermetically closed case of globular or like shape adapted to be mounted upon a ring base, and the expansion coils
25 are pipe connected at their terminals into the said case and are located and arranged conveniently within a cool chamber so as to efficiently absorb heat therefrom either directly or indirectly. Means are provided
30 for separating and trapping lubricating oil from the circuit and resupplying oil to the compressor pistons and other mechanical parts requiring lubrication.

My machine is distinguished from known
40 machines of a like type in that the motor, the compressor, and the condenser are contained in a fixed case which is hermetically sealed, with the expansion coils arranged externally but hermetically sealed into it.
45 Where, as in certain known constructions, the case is fixed and the motor is located externally to the case, drive must be applied by a shaft or by a rod working through a stuffing box in the case, and when the packing becomes worn or the gland loosened the refrigerating agent finds egress and the efficiency of the machine is diminished or lost and a nuisance is created by the escaping vapor or gas. And the same objection is
50 encountered in those constructions in which the case is rotatory and the shaft is fixed to

an external carrier. Where the case is sealed but is rotated, and the compressor is particularly mounted in it, the structure of the parts within the case involves undesirable
60 mechanical features, and it is not practicable to effect refrigeration directly by means of a fixed expansion coil; a rotating heat absorber element must then be used in connection with a brine circulating system. The
65 shape and dimensions of the plant in that case make it ill-suited for domestic and like uses, for which purposes it is highly desirable that the plant shall be of small dimensions and relatively light in weight and
70 compact in shape, completely isolated from external interference, and constructed as a unit adapted to be fitted directly to a heat insulated chamber of any standard form.

An elementary form of apparatus embodying the invention is shown in vertical sectional view in Figure 1 of the accompanying drawings. In this construction an oil trap is not provided and control of the condensing water service is effected manually.
80

Figs. 2 and 3 are incomplete vertical sectional elevational views taken at right angles to each other through a machine embodying automatic means for trapping lubricating oil from the refrigerating agent in circuit and delivering said oil automatically to the shaft bearings and the compressor chamber and also means for controlling automatically the flow of cooling water.
85

Fig. 4 is a plan of the machine as seen when the upper half of the casing and the motor shaft bearing and crank shaft are removed.
90

Fig. 5 is a detail horizontal section illustrating the construction of the manifold containing the charging valve and the regulating valve.
95

Fig. 6 is a plan view of one of the compressor valves.

Fig. 7 is a sectional elevation of the control mechanism for the lubrication system;
100

Fig. 8 is an elevational view of a domestic coil chamber having the machine fitted on the top thereof, the expansion coil being contained within said chamber in the manner
105 indicated in Fig. 1.

Referring to Fig. 1, the machine is mounted upon a ring base 10, the foot of which may be screwed or otherwise fastened to the head 11 of the cool chamber 12. The casing is made in two parts, a lower part 13 and an upper part 14. These parts are
110

jointed together on the surface 15 by sweating or otherwise so as to hermetically close the case. The covering edge of the outer section of the case may be inspun to better
 5 secure the joint. In the upper part of the case the field magnet 16 of the motor is housed. 17 is the armature of the motor. It is carried on a bell or spider 18 which supports the commutator 19 and is keyed
 10 or otherwise mounted on the end of the shaft 20. This shaft is supported in a long bearing 21 carried by a flange 22 which is fixed on a ring seating 23 on the top of a casting 24 which contains the compression
 15 cylinders 25 and the connecting receiving duct 26 from which the gas enters after traversing the expansion coil 27. The upper portion of the casting 24 is formed with a circular flange 28 which sets upon the top
 20 edge of the lower section 13 of the casing and is embraced by the circular belt portion of the upper casing 14. A chamber 29 contained between the lower section 13 of the case and the cylinder casting 24 forms
 25 the condensing chamber, and in this condensing chamber a spiral pipe coil 30 is contained, and the terminals 31 and 32 of this coil are led out through this case, the joints being sealed by welding, sweating or
 30 otherwise so as to insure the sealing of the case. Cooling water is circulated through the coil 30, being supplied through either of the terminals 31 or 32 and ejected through the other of said terminals. The liquid pipe
 35 116 to the expansion coil 27 is led into the chamber 29. 33 is a regulating expansion valve which is set to the proper adjustment when the apparatus is fitted up and then hermetically sealed over and closed to prevent
 40 interference.

The shaft 20 carries a crank disk 34 in the compressor chamber below the flange 22. On this crank disk 34 is an overhung crank pin 35 which is bushed as shown at
 45 36, the bush being rectangular externally and fitted to slide in a cross head 37 formed integral with the pistons 38. The piston heads overrun the inlet ports 39 which merge into the duct 26, and are fitted to
 50 work with small clearance up to the relief heads 40 which are supported by carrier springs 41. The compression valves 42 are kept to their seats by springs 43. The stems of these valves have a long bearing 44 in
 55 the chamber cap 45. The gas delivery chamber contained between the cap 45 and the relief head 40 of each cylinder communicates by a passage 46 with the chamber 29.

In practice the cylinders are fitted with
 60 liners (which correspond with the liners 106 shown in Fig. 3), to facilitate insertion of the pistons, for which insufficient entrance is available in the construction actually illustrated in Fig. 1.

The machine is completely inclosed in the
 65 hermetically sealed case, the electric service connection being carried through said case by means of bolt terminals with insulating sleeves and washers or thimbles, these bolt
 70 terminals providing a path for the current insulated by said sleeves from the casing and permanently sealing the apertures through which they pass.

It will be noted that the structure is characterized by extreme simplicity, the casing
 75 consisting only of two sections which may be sheet metal pressings, adapted to slip one within the other so as to permit of a sweated joint being made to complete the closure. This casing is pierced only to admit
 80 the electric service connections, and the terminals of the pipe coils.

The cylinder casting requires to be machined only by boring the cylinder chambers and tapping the gas delivery chambers
 85 to take the screwed in caps 45, further machining being necessary on the face 23 and on the flange. The long bearing 21 with its flange 22 is finished in one machining
 90 operation.

The condenser may be arranged reversely, that is to say, the compressed gas may be caused to circulate through the condenser coil and the condensing water caused to circulate in the chamber about the coil therein.
 95 This may be done by alternating the pipe connections shown in the drawings.

It is advantageous but not essential that the condensing chamber should be contained in the machine casing. Obviously the condenser
 100 may be a separate chamber with cold water circulation, containing a condensing coil. The gas space in the condenser is in this case connected between the gas delivery chamber outlets 46 and the liquid pipe 116.
 105

It is desirable that the joint between the lower casing 13 and the casting 24 shall be hermetically sealed, preferably by spinning in the top edge of the casing 13 to embrace the casting as shown in Figs. 2 and 3, and
 110 sweating the joint, in order to enable this joint to carry the pressure to which it is subjected when the chamber 29 contains compressed gas.

In operation the rotation of the motor armature 17 turns the shaft 20 and the crank
 115 disk 34 and by means of the crank pin 35 reciprocates the pistons in the cylinders. Nearing the extreme end of the inner stroke, each piston takes its charge from the duct
 120 26 through the port 29 and ejects the compressed charge through the valve 42 into the gas delivery chamber, whence the compressed charge is delivered through the passage 46 into the condensing chamber 29, the
 125 compressed ammonia gas or other refrigerant used changing to the liquid state when cooled by contact with the condensing coil

30. The liquid thence passes through 116 into the expansion coil 27, the rate of flow being controlled by the setting of the regulating valve 33. Heat from the chamber 5 12 is absorbed into this coil, evaporating the refrigerant, and the resultant gas then passes up into the duct 26, the same cycle of operation being maintained continuously.

The main essentials of the invention are disclosed in Fig. 1, but in practice it is desirable to adopt a more developed form of apparatus in which provision is contained for eliminating lubricating oil from the cooling circuit and controlling automatically the supply of condensing water. It is also highly desirable to provide a construction including effective means for charging the machine with ammonia or other refrigerating agent and for regulating the rate of expansion. Improved mechanical features which are also desirable consist in the mounting of the motor spindle and crank disk in ball bearings and otherwise modifying the construction to procure 20 proved efficiency and admit of the operation of the compressing pistons at high speed. These features are shown incorporated in the machine illustrated in Figs. 2 to 7.

30 The arrangement of the ball bearing system for the spindle 20 will be fully understood on reference to Figs. 2 and 3, the bearing housing taking the place of the long surface bearing shown in Fig. 1.

35 Throughout the views similar figures of reference indicate corresponding parts.

One of the leading-in terminals for the motor service wires are shown in Fig. 3, 100 being a bolt having a head 101 with suitable clips or binding pieces 102, 103 being insulating material, 104 a nut, and 105 a washer. The external connections are made to the part 100, 104, or 105 as may be found convenient, a screw terminal being usually 45 tapped into the end of the bolt 100. In this improved construction the cylinders are fitted with liners 106 which are inserted through the back ends of the cylinders after the pistons have been brought into position. 50 The delivery valve 107 is a valve of the horseshoe plate type shown in detail in Fig. 6. It is constructed of flexible steel plate according to known practice and is held against the relief head 40 by means of a 55 helical spring 108 of suitable stiffness. The condensing water coil 30 is fitted with radiating fins 109 to improve its efficiency. The duct 26 in the cylinder casting shown in Fig. 1 is omitted, and the annular cavity 110 surrounding the inlet passages 39 in the 60 liner 106 is connected through the branch pipes 111 to the intake pipe 112 from the expansion coil. The lower part of the cylinder casting is extended as shown at 113 and passes out through the bottom of the

lower section of the case, the joint being closed by a nut 114 which may be sweated over after being screwed home so as to make the joint perfect. The lower end of the pipe 112 is fitted into the neck extension 70 113 of the cylinder casting, and said neck 113 is screwed into the regulating valve casting 115, the joint in this case being also sweated to insure a perfect seal. The condensing chamber 29 is connected by a pipe 75 116 to the receiving pocket 117 of the regulating valve. The regulating valve is a needle valve 118, which is screwed into its tapered seating 119 so as to regulate with the necessary nicety the flow of refrigerant 80 from the extension passage 120 from the pocket 117 to the extension passage 121 at the receiving end 122 of the expansion coil. The delivery end 123 of the expansion coil is connected to the bottom end of the casting 85 115 connecting through the passageway 124 therein to the pipe 112. The screwed joints 122 and 123 are closed by tinning over and after the valve 118 has been adjusted it also is sealed over by means of the cap 125. The 90 pipe is sweated where it passes through the casing 13, and its collar 126 is sweated into the pocket 117.

The clearing and charging valves are shown in section in the lower part of Fig. 2 95 and in horizontal section in Fig. 5, and the regulating valve is shown in Fig. 3. The charging valve 130 is a ball kept to its seat by a helical spring 131. The valve chamber communicates by a passage 136 with the end 100 122 of the expansion coil.

In setting up the machine the atmospheric contents are displaced and the cavities dried by circulating dried air through them before the charge of ammonia or other refrigerating agent is introduced. For these purposes 105 dried air is introduced at the neck 135, forced through the hole 136 into the terminal 122 of the refrigerating coil, and passes through said coil and thence to the 110 cylinders via the forked pipe 112-111, thence through the condensing chamber 29, pipe 116 and hole 132 to the neck 137, which is kept open to atmosphere until the drying out process is completed. A valve similar to 115 130 is fitted in both necks 135 and 137. The neck 137 is now sealed up by a cap such as 134, and then the machine is exhausted through the neck 135, its valve 130 being held open to permit of this being done. An 120 appropriate quantity of ammonia or other refrigerating agent is now introduced through the neck 135 and finally this neck is sealed over by a cap such as 134.

The pistons have each a groove 48 turned 125 in them. These grooves overrun the ends of the liners on the instroke and on the outstroke register with the ports 39 in the liner; they serve the purpose of equalizing pressure in the chamber 170 and the induction 130

pipes 111 by carrying superplus of pressure to or fro between said chamber and pipes via the ports 39, and passages 110.

The oil trap and lubrication control device 5 is located in a chamber 150 formed in the cylinder casting. This chamber communicates through passageways 151 with the head chambers of the cylinders, so that the compressed refrigerating medium passes into 10 said chamber 150 where it drops the entrained oil. Thence it passes to the condensing chamber 29 through the stand pipe 156.

The flanged stud 152 is mounted in the dividing wall 153 by means of a screwed end 154. This stud 152 has a hole drilled centrally in it, and a pipe extension 155 from this hole may be led upward to the upper ball bearings as shown in Fig. 2 in order that oil may be delivered to said bearings 20 and pass thence along the spindle 20 and lubricate the lower bearing. The oil is separated from the refrigerating medium in the chamber 150 and is delivered into the central passage in the stud 152 by means of the float control device shown in Fig. 7. This 25 device consists of a saddle 160 connected by a pipe arm 161 to a float 162, the pipe arm being brought through the float to the bottom thereof and emerging at 163. The saddle 160 rides on the stud 152. A passage way 164 connects the pipe arm 161 to the 30 bearing face of the saddle 160, and a lateral hole 165 from the central hole 166 in the stud 152 provides a connection from said hole 166 to said pipe arm 161. 167 is a counterweight and 168 a spring claw clipping underneath the part 152, and acting to prevent displacement of the parts and to keep the saddle in close contact with the 40 stud 152.

The flange portions on the stud 152 maintain the saddle 160 in proper lateral position. The chamber 150 being in connection with the compression heads of the pistons 45 always carries a higher pressure than the idle chamber 170 in which the cylinders are located. When the oil level rises in the chamber 150 and lifts the float 162 to a predetermined level, the hole 164 in the saddle is brought into register with the pass hole 165 in the hollow stud 152. Oil is then forced by the superplus of pressure in the 50 chamber 150 through the pipe arm 161, the pass holes 164, 165 and 166 into the chamber 170, or optionally through the pipe 155 to the ball bearing casing as already described. A sufficiency of oil is filled into the apparatus before it is closed up to charge 55 the chamber 170 to the center line of the pistons or perhaps a little higher so that the pistons always work in oil and are therefore perfectly lubricated.

The mechanism for controlling automatically the flow of condensing water 60 through the pipe coil 30 is shown in Fig. 2.

This device is controlled automatically by the temperature in the system. Water is admitted through the connection 189 and passes thence through the condensing pipe 30 from 188 to 187 and to the space 186 over the diaphragm 184. The valve 183 is carried by 70 the corrugated diaphragm 184 secured to the walls of the pocket 185 around its edges. The pocket 185 is filled with spirit or other expansive medium sensitive to temperature 75 variation.

The back wall of the pocket 185 is a portion of the lower section 13 of the casing, and is subjected to the temperature of the compressed gas which enters the chamber 29 80 from the trap chamber 150 through the stand-pipe 156. When the temperature in the pocket 185 exceeds a certain point, the expansive medium contained in said chamber distends the diaphragm 184 and thereby 85 opens the valve 183 passing water from space 186 into the passage 181 to the outlet 180.

The condensing water passing over the face of the diaphragm 184, on the other hand, also affects the temperature in the chamber 90 185, and so the expansive effect of the fluid therein is controlled by the condensing water temperature on the one side and by the temperature of the compressed refrigerating gas on the other side and the diaphragm is 95 moved accordingly and the valve 183 so controlled as to approximately proportion the flow of condensing water to the demand.

The valve 183 is adjusted to its correct position by removing the cap 190 and turning 100 the valve on its screwed spindle.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a refrigerating apparatus, the combination of an hermetically sealed case partitioned horizontally into three chambers, 105 an electric motor fitted above the upper said partition with the armature spindle journals of said motor mounted on said partition, a compressor in the intermediate chamber driven from said motor spindle, an oil trap in circuit with the compressor delivery valve chamber, an hermetically sealed condensing chamber below the lower partition, 110 a condensing water service to said condensing chamber, a gas expanding pipe external to said case, a regulating valve in said gas expansion pipe, pipe connections from the terminals of said expansion pipe to the condenser and to the inlet valve of the compressor respectively, and gas tight means for 120 connecting the motor terminals through insulators in said case to a source of electric current external thereto.

2. In a refrigerating apparatus, the combination of an hermetically closed case, a partition subdividing said case horizontally, 125 an electric motor mounted in said case above said partition, a gas compressor mounted in said case below said partition and di- 130

viding the lower part of said case into a condensing chamber and a compressor chamber, gas tight connections from a source of electric current to the motor terminals said connections passing through said case and insulated therefrom, connections between said electric motor and said compressor, passages between the compression valve chambers of said compressors and said condensing chamber, a condensing water coil fitted in said condensing chamber and having its terminals brought out through gas tight apertures in said case, a gas expansion pipe external to said case, a regulating valve in said gas expansion pipe, and connections from the terminals of said expansion pipe to the condensing chamber and to the gas inlet ports of said compressor respectively.

3. In a refrigerating apparatus wherein compressed gas is delivered by a compressor into a receiving chamber wherein lubricating oil is mechanically separated from said gas, means for returning said oil to a chamber in which the compressor is inclosed, said means comprising a float carrying a dip pipe which is connected to a ported saddle which rocks on a ported stud as the float rises and falls and so brings the ports in said saddle and stud into register and permits oil to be forced through said stud into the pump chamber by the pressure acting upon said oil in said receiving chamber, when the oil in said receiving chamber rises to a predetermined level therein.

4. In a refrigerating apparatus, means for automatically controlling the supply of condensing water to the condenser therein, said means comprising a chamber charged with an expansive fluid sensitive to temperature variation and fitted with a flexible metallic head which carries an adjustable water control valve, the back of said chamber being in contact with the condensing gas and the head thereof in contact with the circulating water whereby the temperature of said expansive fluid and the rate of water circulation governed thereby are varied proportionately to temperature changes either in the condensing gas or in the circulating water.

5. A refrigerating apparatus, comprising in combination, a gas-tight casing, an electric motor located therein, a gas compressor within said casing driven by said motor, a condenser also within said casing and connected to said compressor, and a heat absorber located exteriorly of said casing and terminally connected to the compressor and condenser within the same.

6. A refrigerating apparatus as claimed in claim 5, wherein the condenser comprises a chamber within the gas-tight casing and separate from the remaining portion thereof, said chamber being connected to the compressor located in said remaining portion,

and means within the chamber for cooling the same.

7. A refrigerating apparatus as claimed in claim 5, wherein the gas-tight casing is divided by partitions into three chambers, the electric motor being located in one chamber, the gas compressor in another chamber, and the condenser in the third chamber.

8. A refrigerating apparatus as claimed in claim 5, wherein the parts of the casing in which the motor and the compressor are located are separated by a partition having bearings in which are supported a shaft extending through said partition and connected at one end to the rotatable element of the motor and at the other end to the compressor.

9. A refrigerating apparatus as claimed in claim 6, wherein the condenser chamber is formed between a portion of the casing wall and a partition spaced from said wall, extending across the casing and having integral therewith the compressor cylinders and delivery chambers communicating with said cylinders and with said condenser chamber.

10. In a refrigerating apparatus as claimed in claim 5, water-cooling means for said condenser, and means operated jointly in accordance with the temperature of the refrigerating medium and in accordance with the temperature of the cooling water for controlling the supply of said water to the water-cooling means.

11. A refrigerating apparatus as claimed in claim 5, wherein the terminals of the heat absorber are connected to a casting secured to the gas tight casing, one said terminal being connected by a passage to a pipe leading to the compressor, and the other end of the coil being connected by a valved passage in said casing to a pipe leading to the condenser.

12. A refrigerating apparatus as claimed in claim 9, wherein said partition has formed therein a passage leading to ports communicating with the compressor cylinders and connected to one end of the expansion coil.

13. In a refrigerating apparatus as claimed in claim 5, an oil separating chamber provided in said gas tight casing, connections for conducting the gas from the compressor to said chamber, and connections for delivering the gas separated from the oil to the condenser.

14. A refrigerating apparatus as claimed in claim 13, wherein floatable means are located in said oil separating chamber operated by the oil therein in accordance with the level thereof to control the supply of oil forced by the pressure in said chamber to the motor and compressor bearings.

15. A refrigerating apparatus comprising in combination, a compressor, driving means therefor, a condenser connected to said compressor, a heat absorber connected to said

condenser and to said compressor, means for supplying cooling water to said condenser, and means for controlling the water supply, comprising a chamber containing an expandible fluid and subjected on one side to the temperature of the cooling water flowing from said condenser and on another side to the temperature of the refrigerating medium, and valve means in said water supplying means controlled by the expansion and contraction of said fluid.

16. A refrigerating apparatus as claimed in claim 15, wherein the chamber is formed in the wall of the condenser casing and is closed by a flexible diaphragm, and a member is secured to said casing forming a chamber in front of said diaphragm through which chamber passes the water from the condenser, said valve means being connected to said diaphragm and controlling the outlet from the second mentioned chamber.

17. A refrigerating apparatus comprising in combination a gas-tight casing; an electric motor located therein; a gas compressor within said casing driven by said motor; a condenser also within said casing and connected to said compressor; and a closed member hermetically sealed to said casing, forming a heat absorber and terminally connected to said compressor and said condenser through a regulating valve.

18. A refrigerating apparatus, comprising in combination a gas tight casing, a condenser therein; an electric motor and a gas compressor driven thereby both located within said casing; a heat absorber; closed circuit connections for fluid between said condenser, compressor, and absorber; a regulating valve in the fluid circuit between said condenser and said absorber; control means accessible externally to said casing for operating said regulating valve; and gas-tight means for connecting the motor terminals through insulators in said casing to a source of electric current external thereto.

19. A refrigerating apparatus as claimed in claim 6, wherein the compressor is located in a sump chamber above the condenser chamber and below the motor chamber, and adapted to contain lubricating oil so as to lubricate the compressor and the connections between the compressor and the motor, and wherein gas educted from the heat absorber is conveyed to the compressor intakes through pipes led up through said sump.

20. A refrigerating apparatus as claimed in claim 5, wherein the motor is located in the upper part of said casing, the condenser in the lower portion of same, and the compressor is located vertically intermediate the motor and condenser.

21. A refrigerating apparatus as claimed in claim 17, wherein the motor armature

is carried on a vertical shaft which is journaled in a turret bearing the base of which forms a diaphragm covering the compressor chamber.

22. A refrigerating apparatus as claimed in claim 5, wherein the compressor cylinder casting forms the middle portion of the casing and is extended downwardly at the foot through the condenser chamber in the bottom of said casing, and the compressor chamber is divided from the motor chamber at the top of the casing by a diaphragm which supports a vertical journal for the motor shaft.

23. A refrigerating apparatus, comprising in combination, an electric motor, a gas compressor, and a condenser, all contained within an hermetically closed metal casing, which is transversely subdivided by a partition, the condenser being located at one side of said partition and bounded by a part of the casing wall, a heat absorber depending from said casing, and fluid circuit connections including a regulating valve between said compressor, condenser and absorber.

24. A refrigerating apparatus comprising in combination, a gas-tight metal casing subdivided by a substantially transverse partition, an electric motor located within said casing, a gas compressor within said casing driven by said motor, a condenser located within said casing on one side of said partition, a heat absorber, and circuit connections including a regulating valve between said compressor, condenser and absorber, the heat absorber communicating with the compressor on the other side of said partition.

25. A refrigerating apparatus comprising in combination, a casing structure hermetically inclosing a space subdivided by a substantially transverse partition, refrigerant cooling means inclosed by a part of said casing structure at one side of said partition, a refrigerant compressor within said casing at the other side of said partition, an electric motor within said casing for driving said compressor, a heat absorber associated with said casing structure, means including a regulating valve for conducting condensed refrigerant from said cooling means to said heat absorber, means for conducting the warmed refrigerant from said heat absorber to said compressor, and means for conducting the compressed refrigerant from the compressor to the cooling means on the opposite side of said partition.

In testimony whereof I have affixed my signature in presence of two witnesses.

DOUGLAS HENRY STOKES.

Witnesses:

H. B. CAMPBELL,
W. I. DAVIS.