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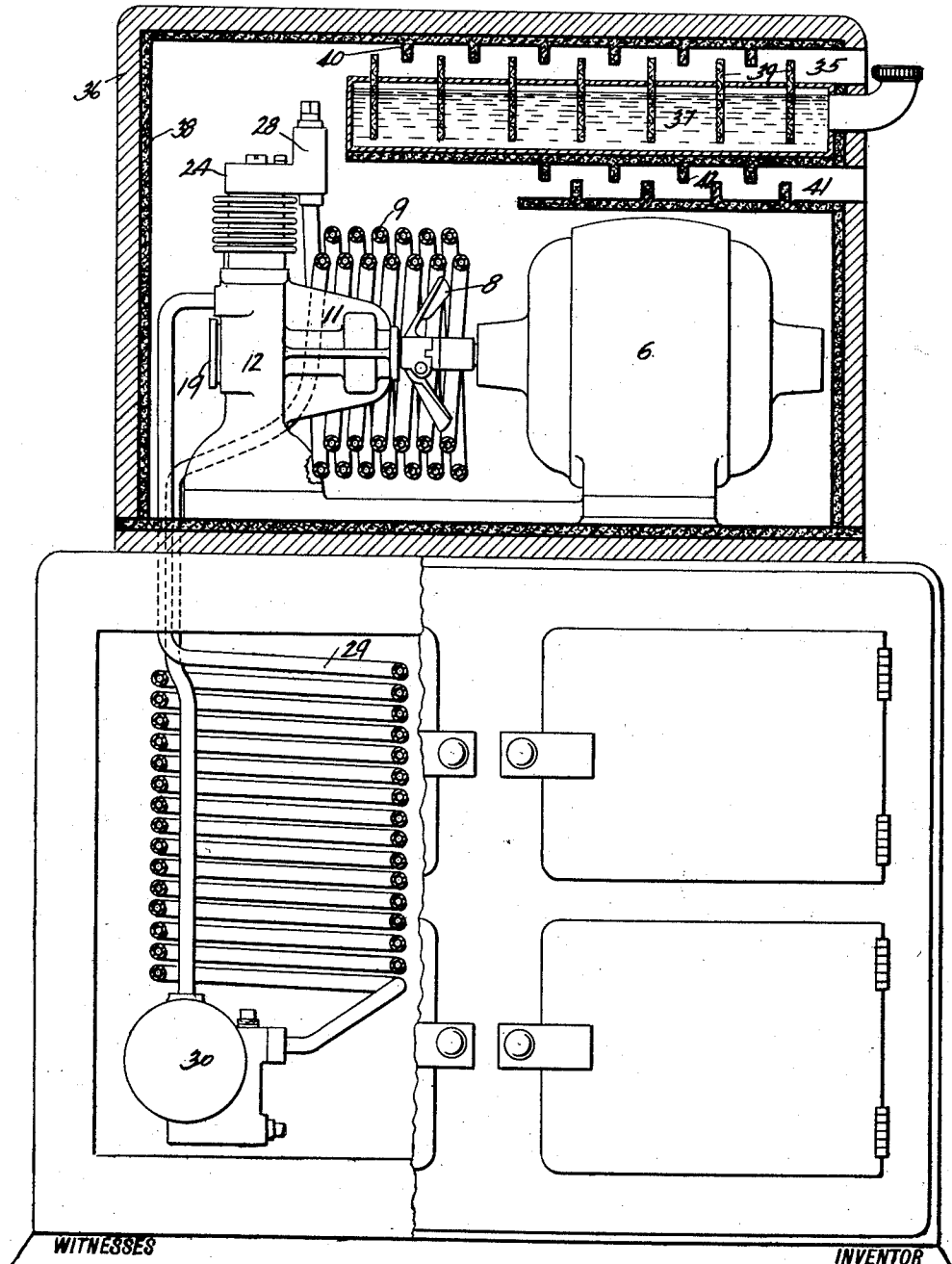
DOMESTIC REFRIGERATING APPARATUS.

APPLICATION FILED DEC. 21, 1917. RENEWED JUNE 28, 1920.

1,381,056. Patented June 7, 1921.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

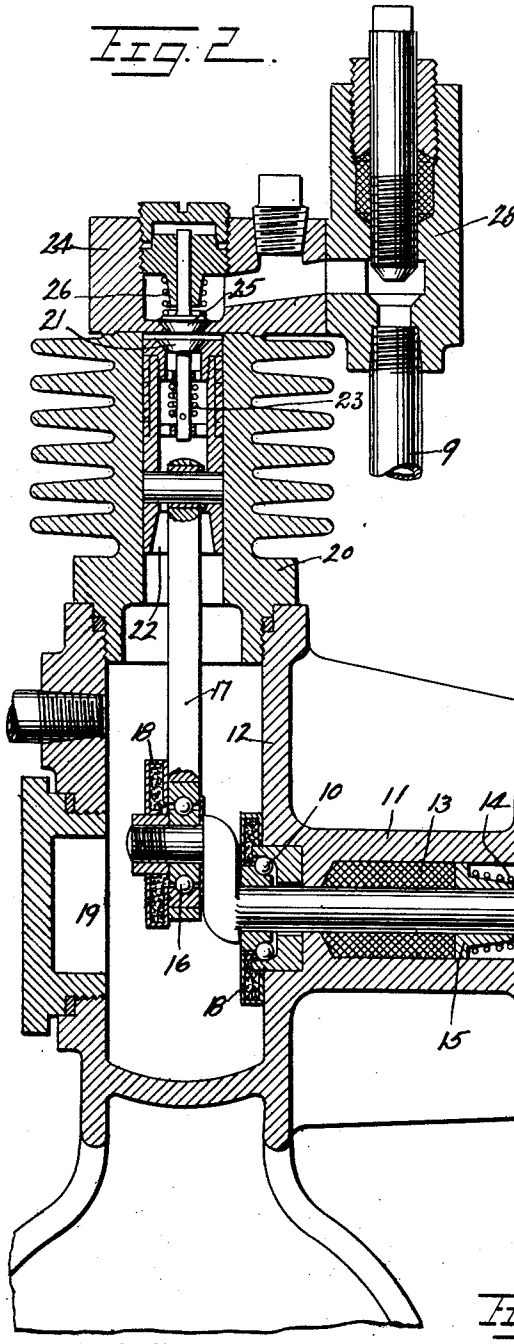


Fig. 3.

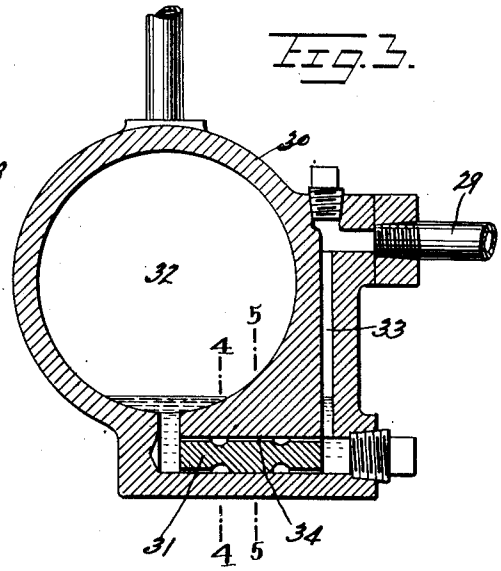
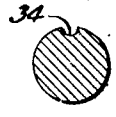


Fig. 4.



Fig. 5.



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DOMESTIC REFRIGERATING APPARATUS.

1,381,056. Specification of Letters Patent. Patented June 7, 1921.

Application filed December 21, 1917, Serial No. 208,256. Renewed June 28, 1920. Serial No. 392,517.

To all whom it may concern:

Be it known that I, RICHARD M. BLAKELY, a citizen of the United States, and a resident of Dayton, in the county of Montgomery and State of Ohio, have invented a new and Improved Domestic Refrigerating Apparatus, of which the following is a full, clear, and exact description.

My invention relates to a domestic refrigerating apparatus of the type in which a readily condensable fluid or vapor is utilized for refrigerating purposes.

An object of the invention is to provide a simple, compact and efficient arrangement which is particularly adaptable for apparatus of small capacity.

Another object of the invention is to provide a refrigerating apparatus in which moist air is utilized as a cooling medium for condensing the vapors of the refrigerating medium.

A further object of the invention is to provide a housing for the apparatus so as to render the same substantially noiseless.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts as herein fully described, illustrated and claimed.

The invention is characterized by the provision of a reciprocating compressor coupled directly to a motor, and a fan on the shaft between the motor and the compressor for circulating the air for cooling the condensing coils of the refrigerating system.

In the accompanying drawings, forming part of the application, similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal section through the housing, including the apparatus, and partly through the cooling chamber, which includes the absorber coils; the moisture supply tank; the absorber and the condenser coils being shown in section;

Fig. 2, a vertical section through the compressor;

Fig. 3, a section through the receiver for the condensing refrigerating medium;

Fig. 4, a cross section on line 4—4, Fig. 3; and

Fig. 5, a cross section on line 5—5, Fig. 3, both sections being through the lines for controlling the flow of the condensed refrigerating medium from the condensing coil to the receiver.

Before proceeding to a more detailed description of my invention it must be clearly understood that the system will include some automatic temperature regulating device for the purpose of starting and stopping the motor. This regulating device will be placed in proximity to the expanding or absorber coils. This is not shown as it does not form part of the invention.

Referring to the drawings, 6 is the motor which is coupled directly to a crank shaft 7 of the compressor. The same shaft carries a fan 8 which is adapted to circulate the air through and about the condenser coil 9, which is preferably disposed coaxial with the crank shaft of the compressor. The shaft 7 bears in roller bearings 10 carried by the extension 11 of the crank casing 12 of the compressor. Packing means 13 are interposed between the two bearings in the extension 11 of the casing. This packing carries a yielding member 14 which continuously exerts pressure against a gland 15 which forces the packing about the shaft 7.

A roller bearing 16 is provided between a connecting rod 17 and the crank of the shaft 7. The reason for providing ball bearings in the compressor is to avoid the use of lubricating oils and the subsequent formation of a permanent gas in the system. In proximity of each of the ball bearings a lubricant pad 18 is provided which supplies the necessary lubricant of a character which is not easily vaporized. The crank casing 12 has a hand hole closed by a plug 19. A cylinder 20 opens into the crank casing, and the communication between the cylinder and the crank casing is controlled by a valve 21 mounted in the top of a piston 22. The valve is normally maintained against its seat by a spring 23.

The cylinder head 24 has also a valve 25 normally maintained closed by a spring 26, the valve controlling the flow of the compressed fluid to the compressor coil 9 through a valve 28, which is preferably provided at the head 24. The valve 21 controls the inflow of the expanding fluid from the crank to the cylinder, the crank casing being connected to the expanding or absorber coil 29 which is located in the cooling chamber.

The absorber coil 29 is also connected to a receiver 30. A plug 31 is interposed between a chamber 32 and a passage 33, which passage is in communication with the absorber coil. This plug 31 has a restricted passage 34 of a size such as to retain the high pressure on the receiver chamber 32 and condenser coil 9 connected to the chamber but pass sufficient liquid into the passage 33 so that volatilization occurs in the range of temperatures desired within the absorber coil.

The compressed refrigerating medium forced into the condenser coil by the compressor is cooled in the condensation coil by air drawn through a passage 35 formed in the upper part of a housing 36 which incloses a motor and compressor and also a water tank 37 which is so disposed as to form part of the passage 35. The housing is preferably lined with sound insulating material 38. The moisture from the tank 37 is discharged into the passage 35 by suitable members 39, such as wicks. In consequence, the air drawn by the fan through said passage is caused to absorb moisture, and the presence of moisture in the air which is caused to circulate about and within the condenser coil has a greater heat-absorbing quality than ordinary air. The passage 35 is preferably made irregular by means of baffles 40 which alternate with the members 39 so as to deaden the sound caused by the movement of the motor, fan and compressor. The air circulating about the condenser coil is driven out through a passage 41, also provided with baffles 42 to deaden the sound. If desired, a suitable baffle can be provided above the condenser coil to insure a better circulation of air about the compressor and coil before the air is discharged out of the housing 36 through the passage 41.

It will be noted that the receiver is at the very bottom of the system and thus insures a liquid covering for the plug 31 which has a restricted passage. This position of the plug permits any liquid in the system to drain into the receiver, consequently, when the motor starts the plant into operation the compressor and motor overload caused by the high pressure that accumulates on the absorber side during the nonoperating period is quickly reduced; thus, the plug with the restricted passage permits the reduction of an overload without the use of bivalves, diaphragm valves, or similar means.

The valve 28 is used only when installing the apparatus and charging the fluid into the system. At all other times it is fully open without causing any restriction to the flow.

I claim:

1. A refrigerating apparatus comprising in combination, a motor, a compressor having its shaft coupled directly to the motor, a condenser coil coaxial with the shaft of the compressor, a fan on the compressor shaft for circulating air about the condenser coil, and an absorber coil interposed between the condenser coil and the compressor.

2. A refrigerating apparatus comprising in combination, a housing, a motor in said housing, a compressor in the housing having its driving shaft coupled directly to the shaft of the motor, a condenser coil within the housing coaxial with the compressor shaft, a fan on the compressor shaft, said housing having an inlet and an outlet for the air, means in said housing for supplying moisture to the air coming into the housing, and an absorber coil interposed between the condenser coil and the compressor.

3. A refrigerating apparatus comprising in combination, a housing, a motor in the housing, a compressor in the housing coupled directly to the motor, a condenser coil, a fan between the compressor and motor for circulating air about the coil, said housing having an air inlet and an air outlet, means in the housing associated with the air inlet for supplying moisture to the air as its enters the housing, and an absorber coil interposed between the condenser coil and the compressor.

4. A refrigerating apparatus comprising in combination, a housing having an air inlet and an air outlet, a motor in the housing, a compressor in the housing coupled to the motor, a condenser coil in the housing, a fan for circulating the air through the inlet and the outlet of the housing and about the coil, baffles associated with the inlet and outlet to deaden the noise produced in the housing by the moving parts, and an absorber coil interposed between the condenser coil and the compressor.

5. A refrigerating apparatus comprising in combination, a housing lined interiorly with sound insulating means, said housing having an air inlet and an air outlet, baffles in said air inlet and air outlet, a motor in the housing, a compressor in the housing coupled to the motor, a condenser coil, a fan for circulating the air through the inlet and outlet of the housing and about the condenser coil, and an absorber coil interposed between the condenser coil and the compressor.

6. A refrigerating apparatus comprising in combination, a housing lined interiorly with sound-insulating means, said housing having an air inlet and an air outlet, baffles in the air inlet and the air outlet, a motor in the housing, a compressor in the housing coupled directly to the motor, a condenser coil in the housing, a fan interposed between the motor and the compressor for circulating the air through the inlet and outlet of the housing and about the

condenser coil, means for supplying moisture to the air coming into the air inlet of the housing to increase the efficiency of the air in cooling the condenser coil, and an absorber coil interposed between the condenser coil and the compressor.

7. A refrigerating apparatus comprising in combination, a motor, a compressor driven from the motor by means of a shaft, an annular condenser coil disposed coaxial with the shaft, a fan driven from the motor to create an air current through the annular coil, and an absorber coil between the compressor and the condenser coil.

8. A refrigerating apparatus comprising in combination, a motor, a compressor driven from the motor by means of a shaft, an annular condenser coil coaxial with the shaft of the compressor, a fan on the compressor shaft for creating an air current through the annular condenser coil, and an absorber coil interposed between the condenser coil and the compressor.

RICHARD MATHEW BLAKELY.