

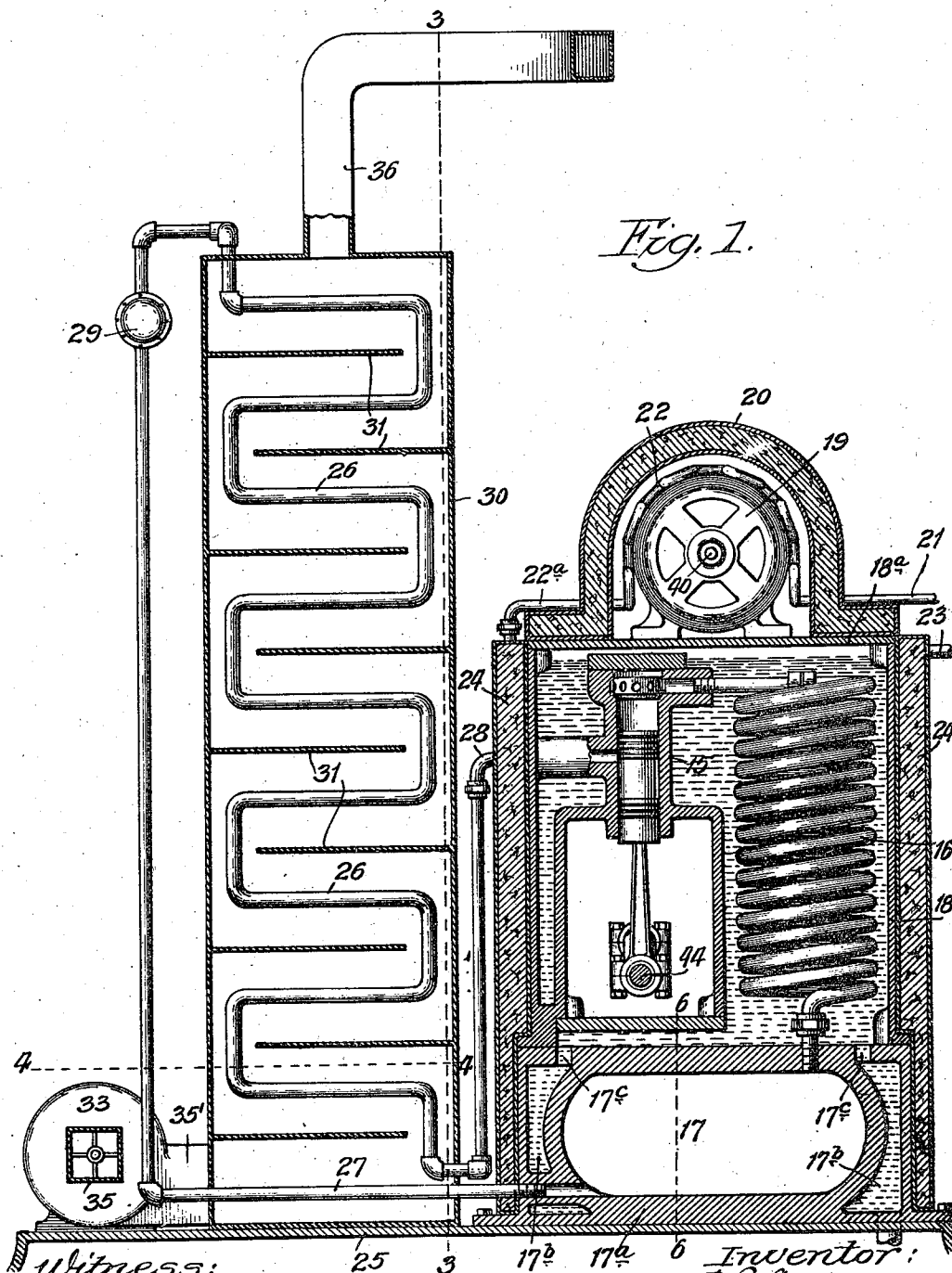
Dec. 18, 1923.

1,478,162

A. P. ANDERSON
REFRIGERATING APPARATUS

Filed Feb. 5, 1917

2 Sheets-Sheet 1



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his Atty

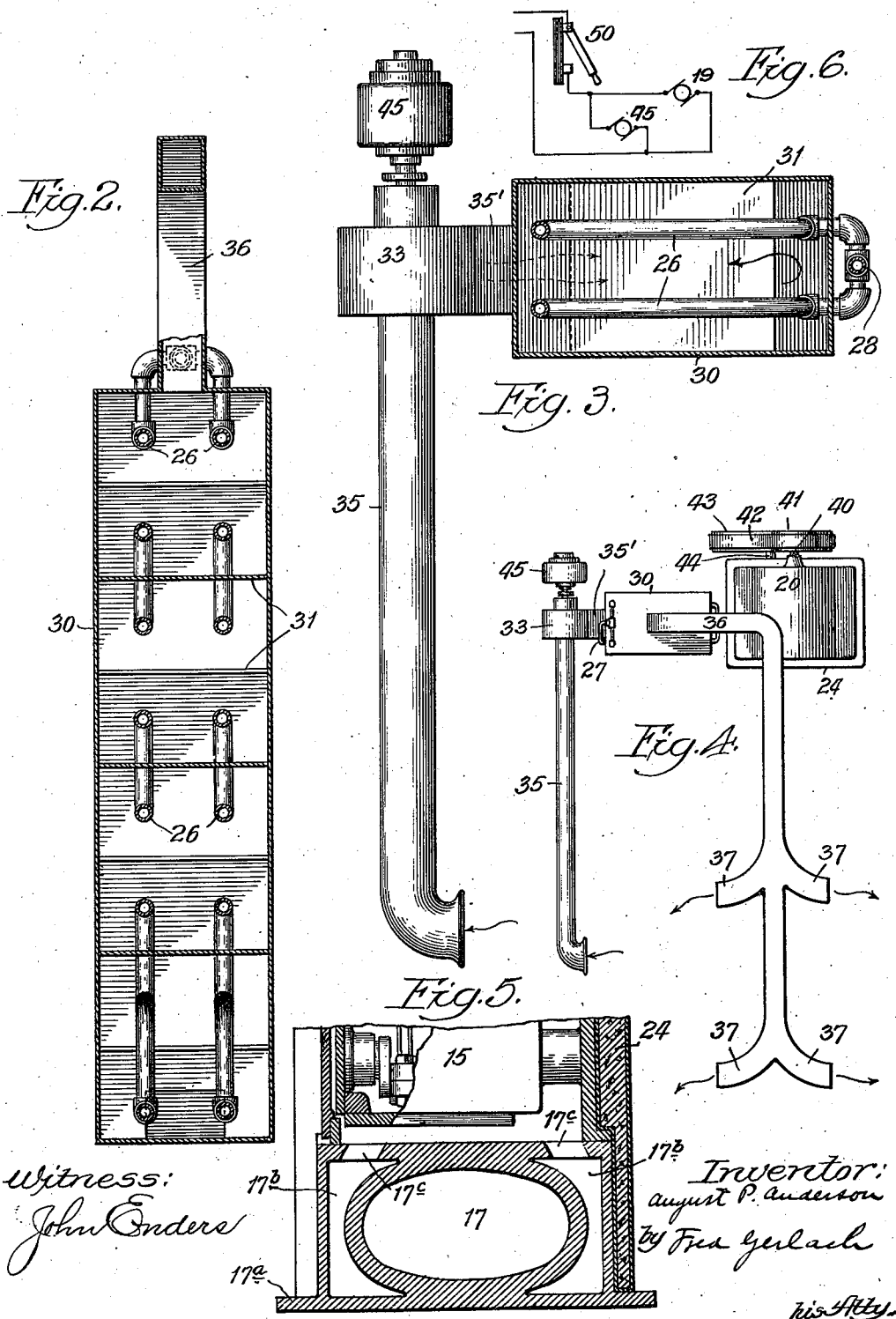
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UNITED STATES PATENT OFFICE.

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REFRIGERATING APPARATUS.

Application filed February 5, 1917. Serial No. 146,629.

To all whom it may concern:

Be it known that I, AUGUST P. ANDERSON, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Refrigerating Apparatus, of which the following is a full, clear, and exact description.

The invention relates to refrigerating apparatus.

In refrigerating rooms of the general character used in markets and the like, it is now common practice to extend the circulating coils around the room to distribute the cold air to different portions of the room.

One object of the invention is to provide an improved apparatus in which provision is made for cooling all or any desired portions of the room without the necessity of extending the coils to distribute the cold air. In practice, it has been found to be desirable to use as short a circulating line as possible in a given refrigerating space. This object of the invention is attained by a forced circulation of air around the refrigerant circulating line or coil and forcible conduction to all or any desired portions of the room, so that a room of a given area may be thoroughly refrigerated from a refrigerant-coil or circulating line of minimum length.

Another object of the invention is to provide improved refrigerating apparatus which is adapted to be assembled in substantial entirety at the factory and installed as a unit in a cooling room, without extending the refrigerant line through the walls of the room.

Other objects of the invention will appear from the detailed description.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is a vertical section of the refrigerating apparatus. Fig. 2 is a section taken on line 3—3 of Fig. 1. Fig. 3 is a horizontal section taken on line 4—4 of Fig. 1. Fig. 4 is a plan of the refrigerating and distributing apparatus. Fig. 5 is a section taken on line 6—6 of Fig. 1. Fig. 6 is a diagram of the electric connections for the electric motors.

The invention is illustrated as embodied in a refrigerating room or refrigerator surrounded by side walls 10 and having a ceiling 11. It will be understood that these walls will be of suitable construction to retain the cold air therein. The refrigerator is usually provided with racks 12 and hooks 14 upon which the products to be refrigerated will be hung.

The refrigerating apparatus comprises a compressor 15 and a condenser coil 16 enclosed within a casing 18, which is adapted for the circulation of water therethrough. The compressor casing is cast in piece with the casing 18.

A refrigerant receiver 17 is formed in a hollow-base 17^a which is provided with a water jacket 17^b communicating with the water-chamber in casing 18 by openings 17^c so that water in said chamber will circulate around the receiver. The condenser is connected to receive high pressure refrigerant from the condenser and to deliver it into the receiver. The top of casing 18 is closed by a removable plate 18^a so that the chamber therein will be adapted for water under pressure. Casing 18 is removably mounted on the hollow-base, being secured thereon by bolts 18, so that the base serves to contain and provides a water-jacket around the receiver and serves as a bottom for the chamber in casing 18. This construction is compact and serves to economize in the space occupied by the machine.

An electric motor 19 for driving the compressor is mounted on the top of the casing and is enclosed in a hood 20. Water for cooling the parts in the casing 18 is supplied by a pipe 21 which delivers water to a coil 22 in the chamber in the hood 20 and around the motor and from said coil water passes through a pipe 22^a into the chamber in casing 18 where it circulates around the compressor and condenser and passes into the water jacket around the receiver. The water from said chamber is discharged through a pipe 23. Base 17^a is mounted on a bed 25. Hood 20 is insulated so that heat from the motor will not be conducted into the refrigerating space and an insulating jacket 24 is provided around the side walls of casing 18 and base 17^a to prevent heat from passing into the refrigerating room. This apparatus exemplifies one

which is adapted to be placed in the refrigerator-room.

The circulating line for the refrigerant comprises a pipe 27 connected to the receiver, a pipe 28 connected to the compressor and coils 26. A pressure reducing valve 29 is included in the circulating line to reduce the pressure in the coils 26, as well understood in the art.

The coils 26 are enclosed in a casing 30 which is mounted on the bed 25 at one side of the base 17^a and casing 18. Baffles 31 are provided in the casing 30 to cause the air passing therethrough to travel in a sinuous path and repeatedly in contact with the coils 26. A blower 33 is mounted on bed 25. An intake pipe 35 is connected to the inlet eye of the fan and its other end is open to receive air in the lower portion of the refrigerating chamber 9 and the outlet 35' is connected to the lower portion of casing 30. A discharge trunk 36 is connected to the top of casing 30 and is extended lengthwise of the ceiling of the refrigerating room and adjacent the ceiling and is provided with laterally extending discharge-branches 37, each of which is provided with a valve 37'. An electric motor 45, mounted on bed 25 drives the blower 33. The shaft 40 of motor 19 is extended through one side of the insulating hood 20 and has secured on the outside of said hood, a pulley 41 for driving a belt 42 which passes around a pulley 43 on the shaft 44 of the compressor 15. Said compressor has a shaft extended through the side of casing 18 and the insulating jacket 24 carries pulley 43 outside thereof. Motors 19 and 45 for driving the compressor and the blower respectively are conjointly controlled by a switch 50 which is electrically connected to both motors, as shown in Fig. 7. As a result, when the compressor is operated, the blower will be operative to distribute cold air from the coils 26.

In operation, the compressor will receive spent refrigerant from the low pressure side of the circulating line, and compress it. From the compressor, the refrigerant will pass through the condenser and into the receiver and thence to the circulating line, and through coils 26 which are enclosed in casing 30.

The blower will draw air from the lower portion of the compartment, force it through the casing 30, containing the refrigerating coils, and through the discharge trunk 36 and branches 37 to the top of the refrigerating compartment or room. In transit through the casing 30, the air will be chilled by the refrigerating coils and then discharged near the ceiling of the compartment or room. As a result, discharge branches will direct the cold air in different directions near the ceiling and thence it

will be distributed throughout the upper zone of the room and will descend towards the floor where it will be again drawn into the fan and cooled thus causing the chilled air to be circulated through and distributed around the room or compartment. By closing valves 37', the circulation may be directed to different portions of the room, if desired.

The improved apparatus exemplifies one in which a forced circulation of air is maintained and in which the air is circulated and forced around the refrigerating coil, to reduce the necessary coil area. Also one in which distribution of the chilled air is effected from a coil disposed in one portion of the room, as contradistinguished from one extending the full length of the room. Also one in which the refrigerating apparatus is insulated so that it can be disposed in the compartment to be refrigerated. Furthermore, the apparatus, including the casing for the refrigerating coil, the blower and its motor and the structure containing the compressor, condenser and receiver are all mounted on a common bed, so that the apparatus, with the exception of the discharge and inlet for the blower, can be completely assembled at the factory and placed in condition for installation in a room.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a refrigerating apparatus, the combination of a bed, a compressor, a condenser, a refrigerant receiver, means enclosing the compressor, condenser and receiver and adapted for the circulation of water therethrough and mounted on said bed, a refrigerant line connected to the receiver and to the compressor, including a coil, a casing around the coil also mounted on said bed and means supported by the bed for forcing air through the casing containing the coil.

2. In a refrigerating apparatus, the combination of a bed, a compressor, a condenser, a refrigerant receiver, means enclosing the compressor, condenser and receiver and adapted for the circulation of water therethrough and mounted on said bed, a refrigerant line connected to the receiver and to the compressor, including a coil, a casing around the coil also mounted on said bed, means supported by the bed for forcing air through the casing containing the coil, and a motor for driving the forcing means supported by the bed.

3. In a refrigerating apparatus, the combination of a bed, a compressor, a condenser,

a refrigerant receiver, means enclosing the compressor, condenser and receiver and adapted for the circulation of water there-through and mounted on said bed, a refrigerant line connected to the receiver and to the compressor, including a coil, a casing around the coil also mounted on said bed, means supported by the bed for forcing air through the casing containing the coil, a motor for driving the forcing means supported by the bed, and a motor for driving the compressor, supported on the enclosing means. 10

AUGUST P. ANDERSON.