

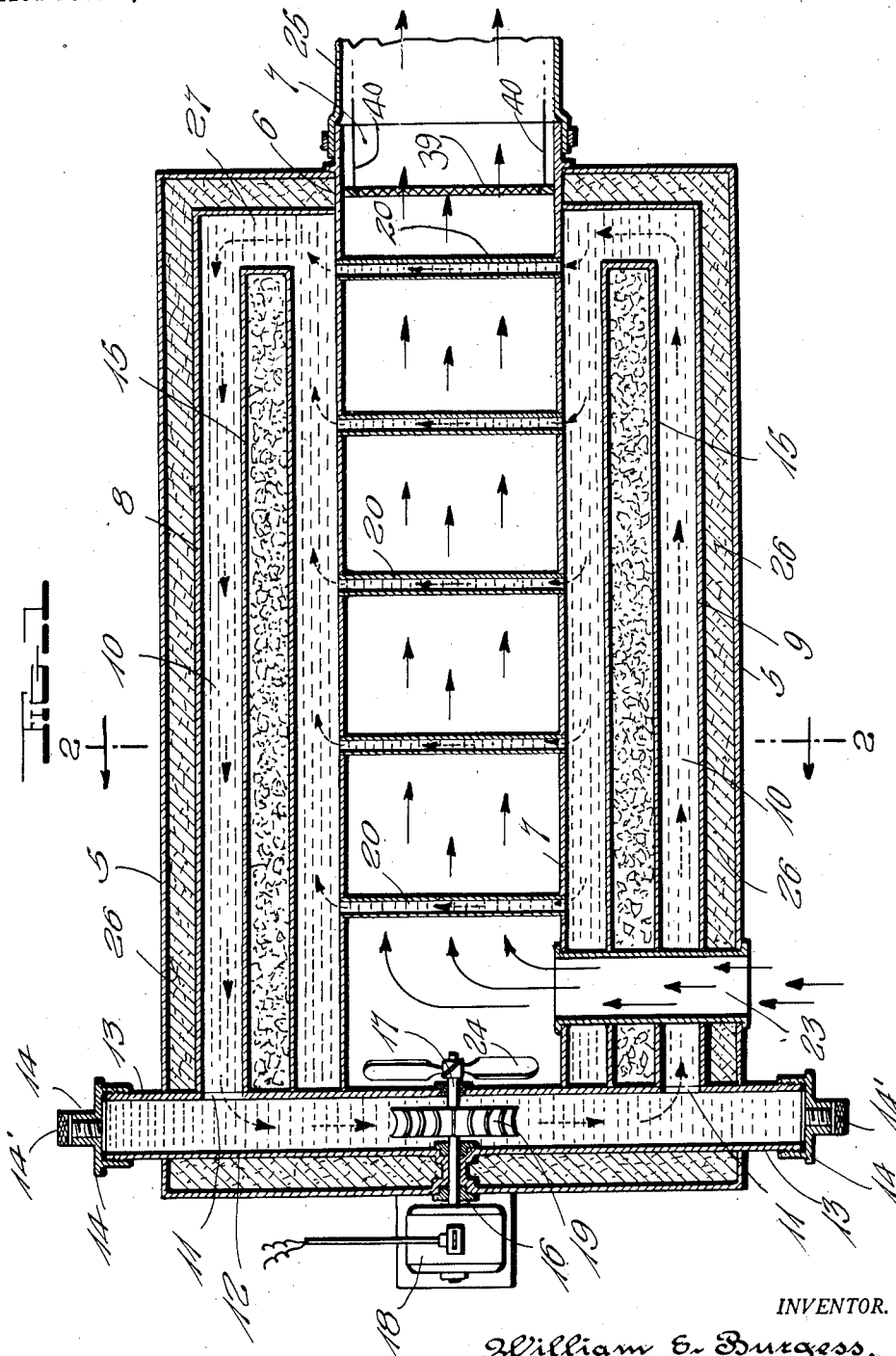
May 3, 1949.

W. E. BURGESS
AIR CONDITIONER

2,469,259

Filed Feb. 7, 1946

2 Sheets-Sheet 1



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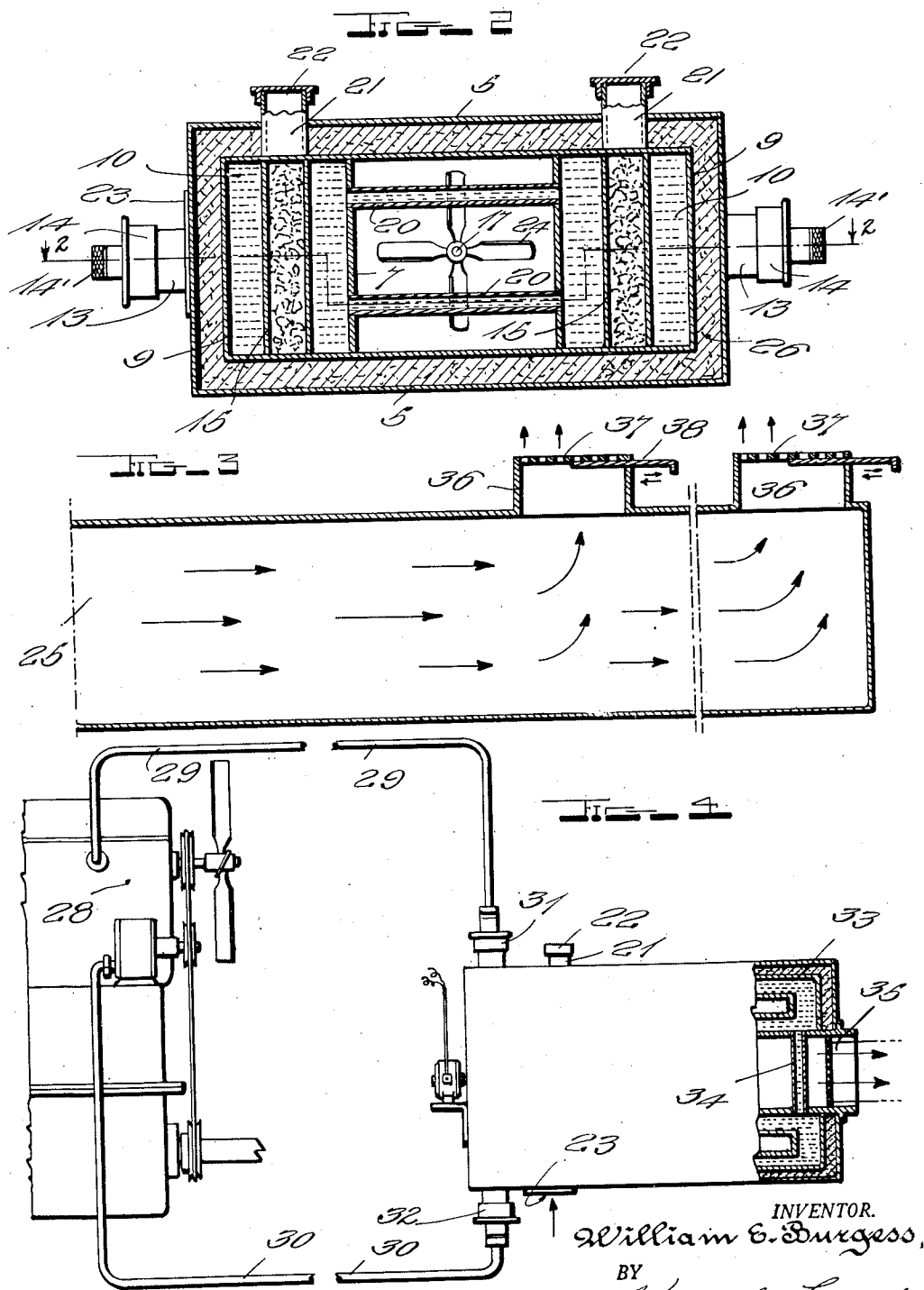
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AIR CONDITIONER

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1 Claim. (Cl. 62-129)

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This invention relates to air conditioners and has for its object to provide a comparatively simple and inexpensive device of this character that may be quickly installed for domestic use or positioned in an automobile or other conveyance for either cooling or heating the air.

A further object of the invention is to provide an air conditioner in which a quantity of liquid is caused to continuously circulate in a casing over a cooling surface to chill the liquid, fresh air being drawn in at one end of the casing and cooled by the liquid before the air is discharged at the other end of said casing.

A further object is to provide the air conditioner with a motor driven pump or impeller for circulating the cooling liquid and further to provide a fan for inducing a flow of air through a central conductor and in contact with spaced tubes connecting the liquid containers whereby the air is thoroughly cooled by the time it reaches the discharge end of said central conductor.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

In the accompanying drawings forming a part of this specification and in which similar numerals of reference indicate corresponding parts in all the figures of the drawings:

Figure 1 is a horizontal sectional view of an air conditioner embodying the present invention and showing the device supported in a horizontal plane,

Figure 2 is a transverse sectional view taken on the line 2-2 of Figure 1.

Figure 3 is a longitudinal sectional view of the exit pipe showing the manner of controlling the discharge of either cooled or heated air therefrom, and

Figure 4 is a side elevation showing the device attached to the engine of an automobile and supported in a vertical plane.

The improved air conditioner forming the subject-matter of the present invention may be installed in either a vertical or horizontal position and used either for cooling or heating purposes, and in Figure 1 of the drawings, the device is shown supported in a horizontal position and used for cooling or chilling air prior to the discharge thereof into the interior of the room of a dwelling or other building.

The air conditioner comprises a casing or housing 5 which may be either cylindrical or angular in cross section and is provided at its outer end

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with an opening 6 adapted to receive a central air conductor, indicated at 7.

Disposed within the casing 5 on opposite sides of the central air conductor 7 are spaced containers 8 and 9 preferably extending the entire length of said casing and adapted to contain any suitable non-freezing liquid, indicated at 10. Arranged at the rear of the casing 5 and communicating with the interior of the containers 8 and 9 through openings 11 is an auxiliary container or header 12 having its opposite ends provided with filling nipples 13 normally closed by detachable closure caps 14 so that by removing the caps 14 the cooling liquid may be poured into the auxiliary container or header 12. Threaded in the ends of the caps 14 are detachable screw plugs 14' which are removed when the air conditioner is used in connection with an automobile.

Disposed within the liquid containers 8 and 9 and spaced from the adjacent walls thereof are metallic containers 15 adapted to receive a suitable refrigerant, such as artificial or natural ice, for the purpose of cooling the liquid 10, which liquid, in turn, cools the air, as will be more fully explained hereinafter. Extending through suitable packing glands 16 in the casing and outer wall of the header 12 is a shaft 17, the inner end of which is operatively connected with a suitable electric motor 18 which serves to rotate said shaft. Disposed within the auxiliary container or header 12 and mounted on the shaft 17 is a pump or impeller 19, the purpose of which is to circulate the fluid 10 through the casing and in contact with the chilled walls of the containers 15 thereby to keep the liquid at a sufficiently low temperature to insure proper cooling of the air. The containers 8 and 9 are connected by a plurality of spaced tubes 20 which extend transversely of the central conductor 7 and form a source of communication between the interior of said containers so as to permit the liquid to flow from one container to the other when the pump is in operation. The containers 15 are provided with filling nipples 21 through which said containers 15 may be filled with any kind of refrigerant, said nipples being provided with closure caps 22 of any suitable construction.

Air is admitted to the central conductor 7 through a pipe 23, one end of which is open to the atmosphere while the other end thereof communicates with the interior of the conductor 7, as best shown in Figure 1 of the drawings. A fan blade 24 is secured to the inner end of the shaft 17 for the purpose of drawing air inwardly through the pipe 23 and inducing a flow of air

longitudinally within the conductor 7 to the discharge end thereof. A pipe 25 is secured to the outer end of the conductor 7 for delivering cooled air to any desired place within a room or other enclosure. Interposed between the casing 5 and the containers 8 and 9 is a packing 26 of insulating material and this insulating material preferably extends entirely around the casing so as to thoroughly insulate the same. The outer ends of the refrigerant containers 15 are spaced from the outer ends of the liquid containers to form passages 27 so as to permit the cooling fluid to flow around the ends of said refrigerant containers.

In operation the header 12 and containers 8 and 9 are filled with a suitable non-freezing liquid through the nipples 13 of said header and the containers 15 filled with Dry Ice, natural ice, or other refrigerant through the nipples 21. The motor 18 is then started which causes the pump 19 to circulate the cooling liquid through the adjacent opening 11 and thence around the refrigerant container 15 in one of the liquid containers and thence through the tubes 20 to the interior of the other container 8 and back through the opening 11 to the pump, thus causing a continuous circulation of the cooling liquid within the casing. During the rotation of the motor the fan 24 will draw air through the pipe 23 and as the current of air passes through the conductor 7 it will come in contact with the tubes 20 and become thoroughly chilled before the air is discharged through the end of the conductor 7 into the interior of a room. As the cooling fluid surrounds the walls of the central conductor 7 and said fluid also circulates through the tubes 20, an extended cooling surface is presented to the flow of air through the conductor thereby insuring thorough chilling of the air, as will be readily understood.

For use when the climate and temperature are such that warm air rather than cold air is desired, there is provided an electric heating element 39 which may be fixed to the walls of the conductor 7 in the opening 6. Wire conductors 40 connect the heating element 39 to a source of electric supply for heating the element 39.

In Figure 4 of the drawings, there is illustrated a modified form of the invention in which the device is used for heating the tonneau of an automobile. In this form of the invention, the device is supported in a vertical plane and operatively connected with the water jacket 28 of the automobile engine by means of upper and lower pipes 29 and 30, one of which is threaded in the upper nipple 31 of the header and the other in the lower nipple 32 after removing the closure plugs 14' shown in Figure 1. It will thus be seen that hot water from the jacket 28 of the engine will

enter the header through the pipe 29 and thence flow within one of the liquid containers 33 and through the spaced connecting tubes 34 to the other container and back to the water jacket 5 through the pipe 30 thereby to heat the walls of the central air conductor 35 so that air flowing through said conductor and coming in contact with said heated walls and with the tubes 34 will be thoroughly heated and delivered into the tonneau of the automobile in a warm condition.

When using the device on an automobile, I preferably provide the extension pipe 25 with one or more discharge nipples 36, the upper end of each of which is closed by a perforated plate 37, the discharge of the air through the perforations in the plates being controlled by sliding cut off plates or dampers, indicated at 38.

It will, of course, be understood that the air conditioners may be made in different sizes and shapes and formed of any suitable material without departing from the spirit of the invention.

Having thus described the invention, what is claimed as new is:

25 An air conditioner comprising an outer casing open at one end and having an insulating lining, a pair of refrigerant liquid containers in said casing extending along the length thereof and spaced apart transversely of said casing forming an air conductor therebetween opening through 30 the open end of said casing, refrigerant containers in each of said liquid containers spaced from the walls thereof providing liquid conducting passages about the refrigerant containers, a header 35 at the closed end of said casing connecting said liquid containers and extending through opposite side walls of said casing, tubes between said spaced liquid containers extending across said air conductor, an air inlet pipe through a side 40 wall of said conditioner at the closed end communicating with said air conductor, a fan in said air conductor for flowing the air between said liquid containers and over said tubes and means for circulating the liquid through said liquid con- 45 tainers, said tubes and said header.

WILLIAM E. BURGESS.

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