C. F. MARTIN.

AIR COOLER.

APPLICATION FILED OCT. 27, 1908.

919,611. Patented Apr. 27, 1909.

Fig. 3.

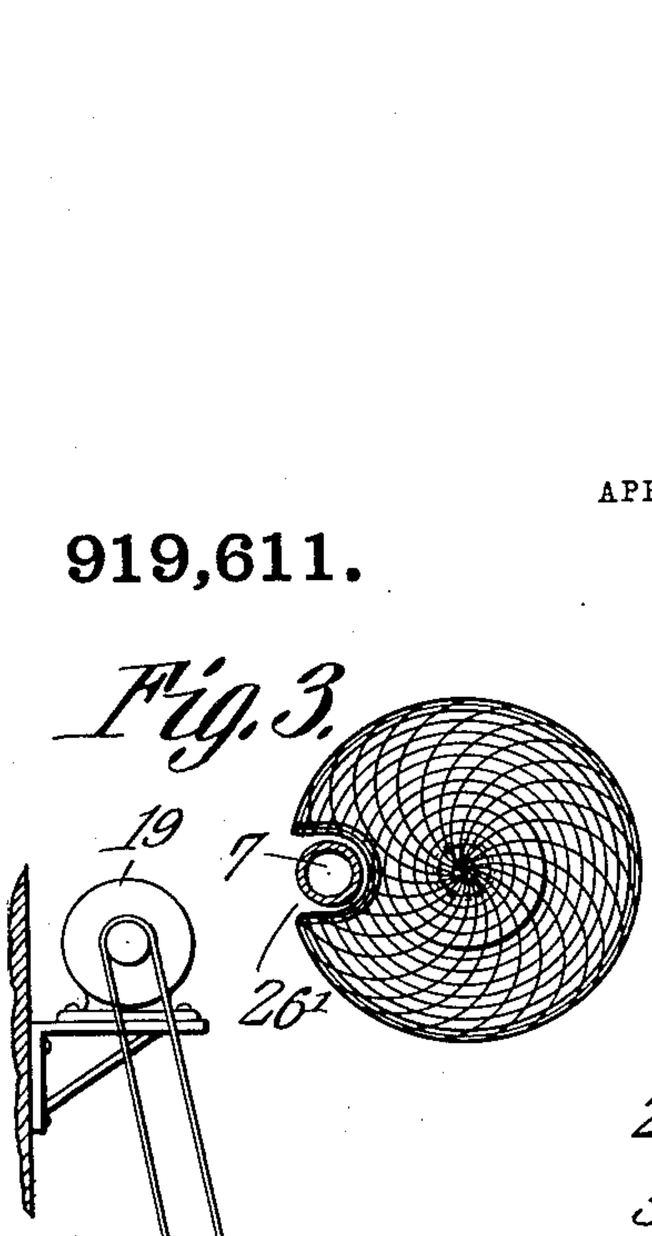
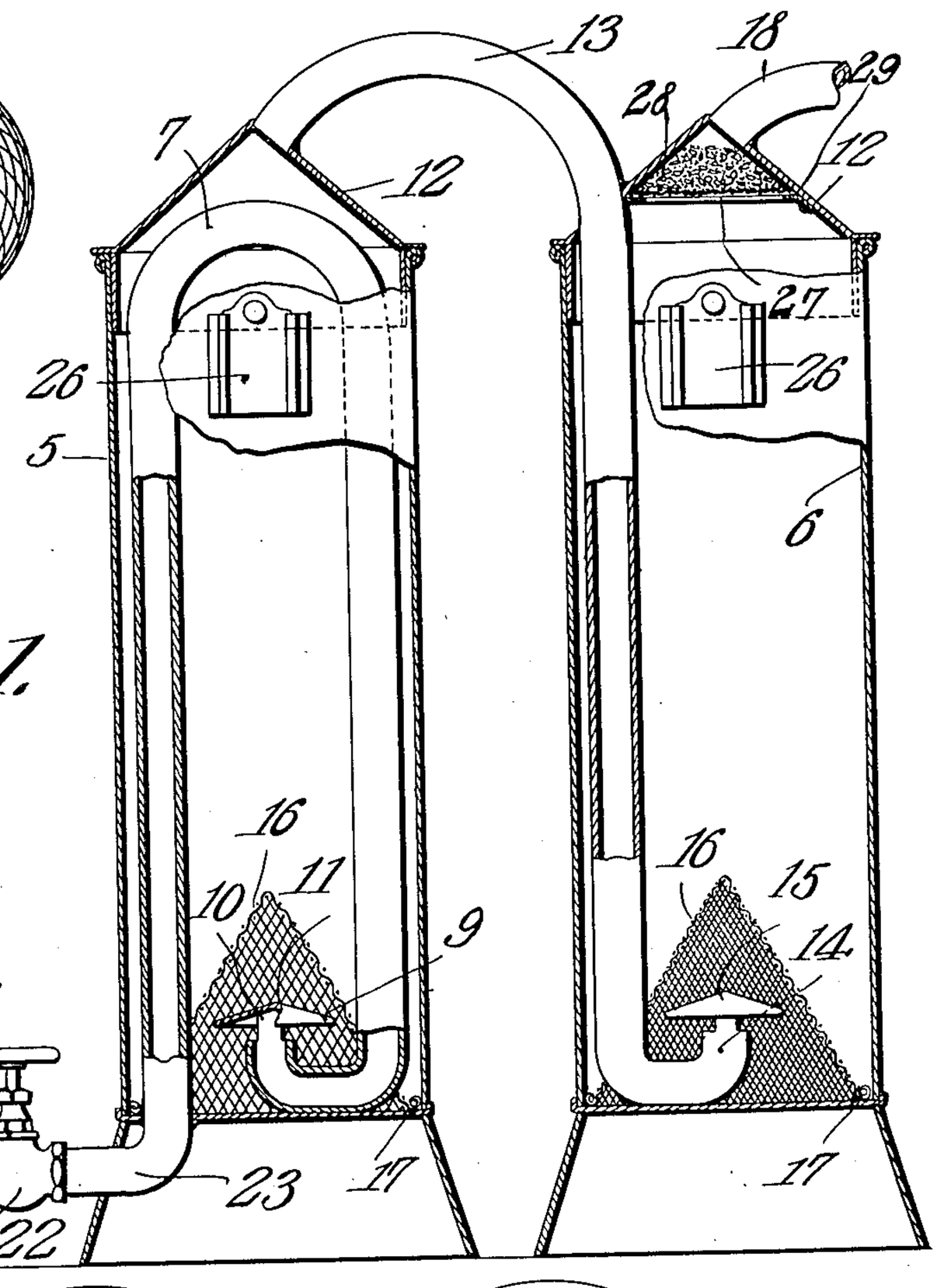


Fig. 1.



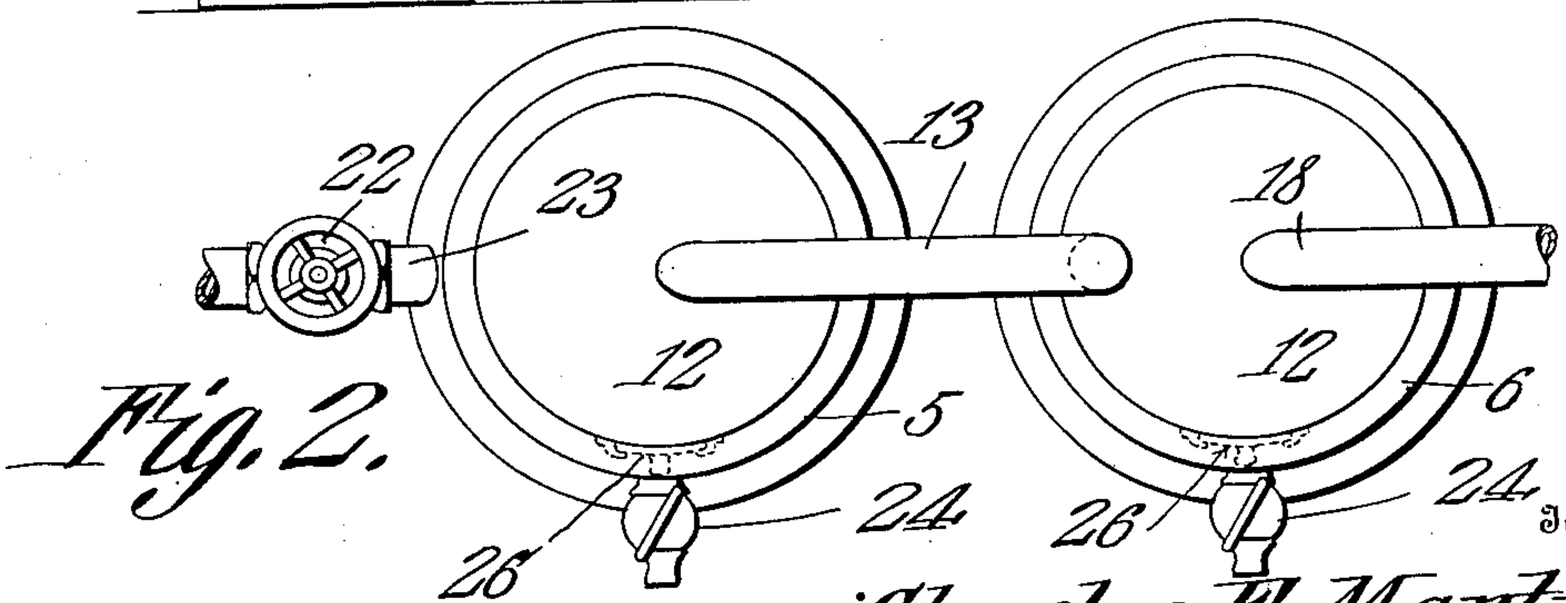


Fig. 2.

Witnesses

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CHARLES F. MARTIN, OF LITTLE ROCK, ARKANSAS.

AIR-COOLER.

No. 919,611. Specification of Letters Patent. Patented April 27, 1909.

Application filed October 27, 1908. Serial No. 459,781.

To all whom it may concern:

Be it known that I, CHARLES F. MARTIN, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented a new and useful Air-Cooler, of which the following is a specification.

This invention relates to ventilating systems, and more particularly to means for supplying cool fresh air to the interior of churches, theaters, hospitals, private dwellings and similar buildings.

The object of the invention is to provide a comparatively simple and highly efficient apparatus by means of which the interior of a room or other inclosure may be thoroughly ventilated and maintained at a cool uniform temperature even in the hottest weather.

A further object is to provide an apparatus of the class described including a plurality of tanks, one of which is adapted to contain a cooling solution, preferably brine, and the other salted ice, there being a fresh air supply pipe communicating with the interior of the brine tank and a blast fan arranged in the supply pipe for forcing a current of air through both tanks before the same is delivered to the interior of the several rooms of a building.

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

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

In the accompanying drawings forming a part of this specification:—Figure 1 is a longitudinal sectional view of a cooling apparatus constructed in accordance with my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a detail top plan view of one of the conical screens and its associated parts.

Similar numerals of reference indicate corresponding parts in all of the figures of the drawings.

The cooling apparatus forming the subject matter of the present invention includes a pair of tanks or receptacles 5 and 6, constituting, respectively, a brine and an ice tank, of which the former is adapted to contain a saturated solution of salt and ice and the latter a quantity of cube ice sprinkled with salt.

Disposed within the brine tank 5 is an inverted U-shaped pipe 7, one end of which extends through the bottom of the tank for connection with a blast fan 8, while the other end of the pipe 7 rests on the bottom of said tank with its terminal deflected upwardly to form a discharge nozzle 9.

Extending vertically from the pipe 7 at the discharge nozzle 9 are one or more arms 10 which serve to support a dished plate or disk 11, the latter constituting a deflector and serving to distribute the air uniformly through the brine.

Each tank or closure is provided with a removable cap or closure 12, preferably conical in shape, as shown, and to one of which is secured a pipe 13 leading from the interior of the brine tank 5 to the interior of the ice tank 6, the free end of the pipe 13 being extended downwardly within the tank 6 for engagement with the bottom of said tank and having its terminal bent upwardly to form a discharge nozzle 14 similar in construction to the nozzle 9. A dish-shaped plate or deflector 15 is also secured to the pipe 13 in spaced relation to the discharge nozzle 14 for directing the air entering through said nozzle uniformly through the contents of the tank 6.

The deflectors 11 and 15 are housed within conical shaped screens 16 each having its apex spaced from the top of the adjacent deflector and its base provided with an annular rim 17 adapted to bear against the interior walls of the adjacent tank at the base thereof for centering the screen with respect to the deflectors and thereby preventing accidental displacement of the same. The screens 16 serve to prevent deposits of salt from accumulating around the discharge nozzles and also operate in a measure to relieve the deflectors 11 and 15 from the weight of the ice or other contents of the tanks.

Extending from the cap or cover 12 of the tank 6 is a discharge pipe 18, one end of which communicates with the interior of said tank, while the other end thereof is extended to the interior of a house or other building to be supplied with cool air, it being preferred to provide a fan (not shown) in the pipe 18 for distributing the cool air in the several rooms of the building. If desired, however, the discharge pipe 18 may be connected with the ordinary heating pipes

of a building in summer and in which event the cool air will be supplied to the several rooms through the usual registers, it being of course understood that when such a means is employed for distributing cool air in the room of a building that suitable vent openings will be provided to permit the exit of foul air from the room.

A motor 19 is arranged on a suitable support adjacent the tanks and is operatively connected through the medium of a belt 20 with the driving pulley 21 of the fan 8 so that the latter may be rotated to force a current of air through both tanks to the discharge pipe 18. If desired, a similar belt may be extended from the motor 19 to the fan in the pipe 18, above referred to, so that both fans may be operated simultaneously.

A valve 22 is preferably arranged in the supply pipe 23 for regulating the speed of the air current delivered from the fan and admitted to the interior of the brine tank, there being a waste cock 24 communicating with the interior of each tank at the bottom thereof for drawing off the contents of the tanks when it is desired to clean the same.

In order to relieve the air of excessive moisture before same is delivered to a building, a screen 27 is placed in the cap or cover of the ice receptacle 6 and the space between said screen and the top of the cover filled with a quantity of crushed lime, indicated at 28.

The screen 27 is supported within the cap 12 by a segmental retaining flange 29, which latter is detachably secured to the interior walls of the cap so that the screen may be readily removed and the lime in the chamber or pocket replenished when necessary.

In operation the tanks 5 and 6 are filled with ice and brine, respectively, by moving the sliding doors or closures 26 to open position after which said doors are closed and the motor 19 operated to rotate the fan 8, the quantity of air admitted to the interior of the brine tank being regulated by manipulating the valve 22. The air from the fan passes upwardly through one leg of the pipe 7, and thence downwardly through the other leg thereof and is discharged at the nozzle 9, the air being deflected upwardly through the contents of the tank 5 and discharged through the pipe 13 and nozzle 14 into the ice tank 6. The air after entering the tank 6 passes upwardly between the blocks of ice in said tank and is discharged through the pipe 18 into the room, in the manner before stated. The pipe 7 forms an air seal, while the screens 16 serve to prevent the entrance of foreign matter to the discharge nozzles, said screens being provided with openings 26′ to permit the passage of the pipe 7 and 13, as shown.

Attention is here called to the fact that by making the pipe 7 substantially U-shaped, the air from the fan receives an initial cooling before being discharged upwardly through the brine, while the lime in the tank 6 serves to relieve the air from excessive moisture before the same is discharged into the room to be cooled and ventilated. Moreover, by providing a pipe 7 of the shape shown and described a very large surface is presented to the contents of the tank 5 and the temperature of the air thus greatly reduced before it is discharged into the salt solution, this resulting of course in a great saving of ice. When the valve 22 is closed as when the blast fan is stopped, the pipe 7 forms an air seal which at once prevents the salt solution from flowing back into the fan casing, this however being obviously impossible while the fan is in motion. Should the air be discharged into the tank 5 without the use of the inverted U-shaped pipe 7 the full weight of the solution and ice contained within the tank 5 would resist the passage of air from the fan and would require a force greatly in excess of that used with the present construction in order to direct the air into the tank. Should the speed of the fan slacken to any extent the discharge of the fluid back through the pipe and into the fan casing would be inevitable.

Importance is attached to the fact that the caps 12 are cone-shaped, because they thus deflect the air current directly into the outlet and thus avoid the violent contact and friction which would be produced by forcing the air against surfaces disposed at right angles to the direction of movement of the air currents.

Having thus described the invention what is claimed is:—

1. A device of the class described including a plurality of tanks, one of which is adapted to contain a brine solution and the other salted ice, a U shaped pipe disposed within the brine tank and provided with an upwardly extending nozzle, a conductor connecting the brine and ice-receiving tanks, and means operatively connected with the U shaped pipe for forcing a current of air through both of said tanks.

2. A device of the class described including a plurality of tanks, one of which is adapted to contain a brine solution and the other a quantity of salted ice, a U shaped pipe disposed within the brine tank and having one leg thereof bent upwardly to form a discharge nozzle, a deflector carried by and spaced from the discharge nozzle, a conductor connecting the brine tank with the ice tank, a discharge pipe leading from the ice tank, and means operatively connected with the U shaped pipe for forcing a current of air through both of said tanks.

3. A device of the class described including a plurality of tanks, one of which is adapted to contain a brine solution and the other a

quantity of ice, a U shaped pipe discharging into the brine tank and having one leg thereof bent upwardly to form a discharge nozzle, a deflector carried by and spaced from the discharge nozzle, a screen forming a housing for the deflector, a conductor secured to the upper end of the brine tank and discharging at the lower end of the ice tank, a discharge pipe communicating with the interior of the ice tank, and a fan connected with the U shaped pipe for forcing a current of air through both of said tanks.

4. A device of the class described including a plurality of tanks, one of which is adapted to contain a brine solution and the other a quantity of salted ice, a U shaped pipe discharging within one of said tanks and having one end thereof connected with a source of air supply and its opposite end bent upwardly to form a discharge nozzle, a deflector carried by and separated from the discharge nozzle, a conical shaped screen forming a housing for the deflector, a conductor having one end thereof connected with the upper end of the brine tank and its opposite end extended to the bottom of the ice tank and its terminal bent upwardly to form a discharge nozzle, a deflector disposed above the discharge nozzle of the brine tank, a screen forming a housing for the last mentioned deflector, a discharge pipe leading from the upper end of the ice tank, a fan connected with the U shaped pipe for forcing a current of air through both of said tanks, and a valve for controlling the flow of air through said tanks.

5. A device of the class described including a plurality of tanks, one of which is adapted to contain a brine solution and the other a quantity of salted ice, conical shaped caps forming closures for the upper ends of the tanks, an inverted U shaped pipe discharging within the brine tank and having one leg thereof operatively connected with a source of air supply and its opposite end bent upwardly at the center of said tank to form a discharge nozzle, a deflector carried by and spaced from the discharge nozzle, a conical shaped screen forming a housing for the deflector and having its lower edge reinforced and arranged to bear against the side walls of said tank at the bottom thereof, a conductor having one end thereof extended through the conical cap of the brine tank and its opposite end disposed within the ice tank with its terminal bearing against the bottom of said ice tank and bent upwardly to form a discharge nozzle, a deflector arranged above said discharge nozzle, a conical screen surrounding the deflector of the ice tank, a discharge pipe leading from the conical cap of the ice tank, a valve for controlling the supply of air to said tanks, and a drain cock communicating with the interior of each tank at the bottom thereof.

6. A device of the class described including a plurality of tanks, one of which is adapted to contain a brine solution and the other a quantity of salted ice, conical shaped caps forming closures for the upper ends of the tanks, an inverted U shaped pipe discharging within the brine tank and having one leg thereof operatively connected with a source of air supply, a pipe connecting the caps of said tanks, a flange secured to the interior wall of the cap of one of the tanks, a screen supported by the flange and spaced from the upper end of the cap to form a pocket adapted to contain a quantity of lime, and means connected with the U shaped pipe for forcing a current of air through both of said tanks.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES F. MARTIN.

Witnesses:
SAM COHN,
MAURICE L. ALTHEIMER.