Aug. 28, 1934. H. S. DE MALAUSSENE ET AL 1,972,010

AIR COOLING DEVICE

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Fig. 1.

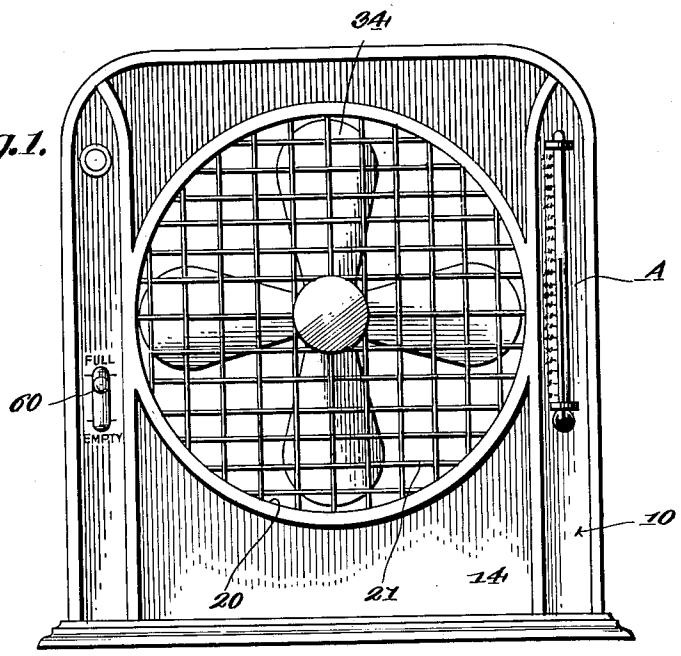
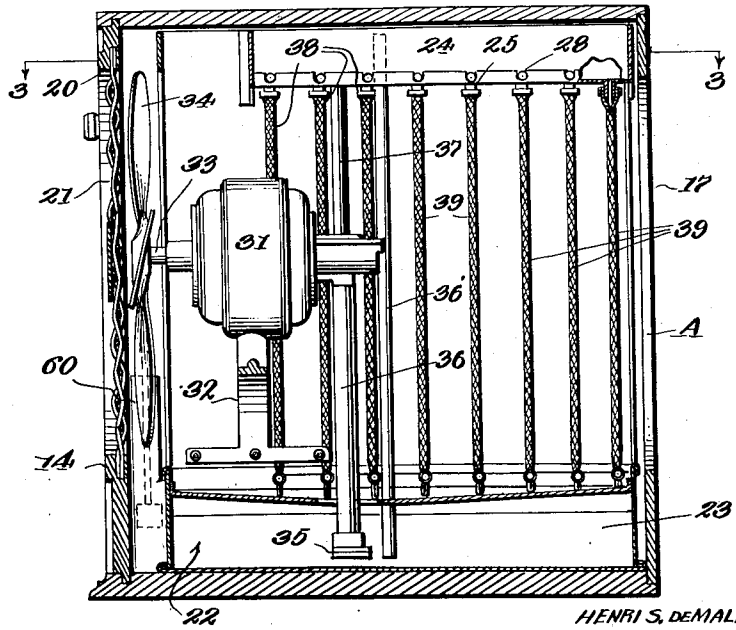


Fig. 2.



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Fig. 3.

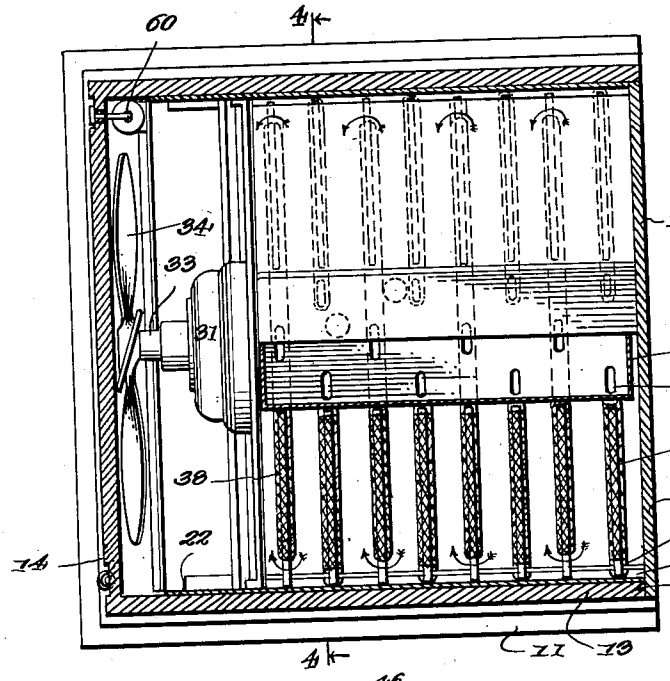
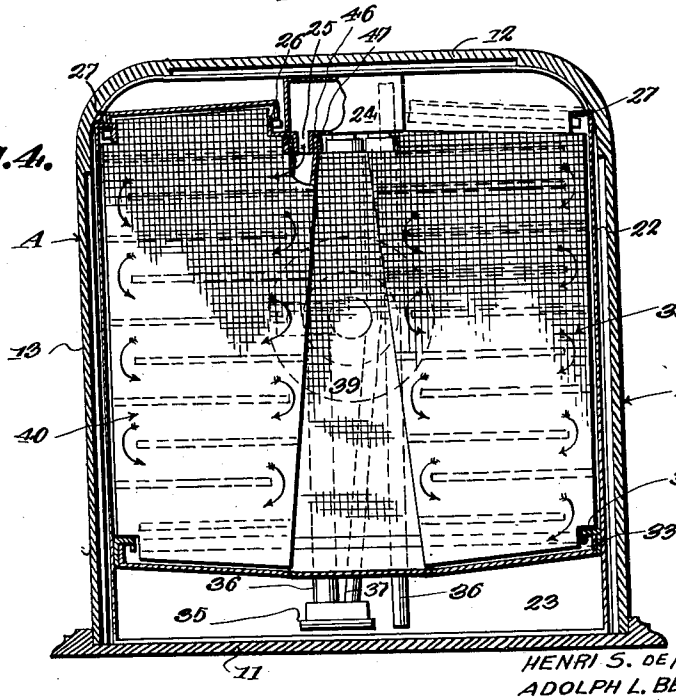


Fig. 4.



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Fig. 5.

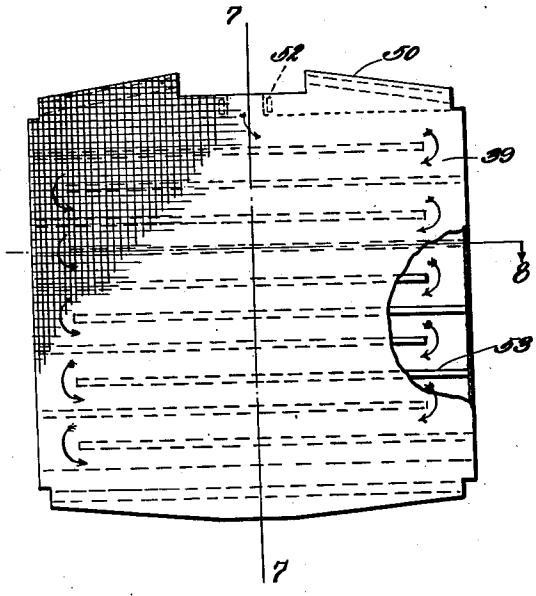
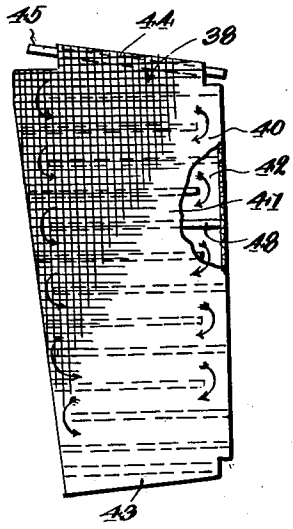


Fig. 6.



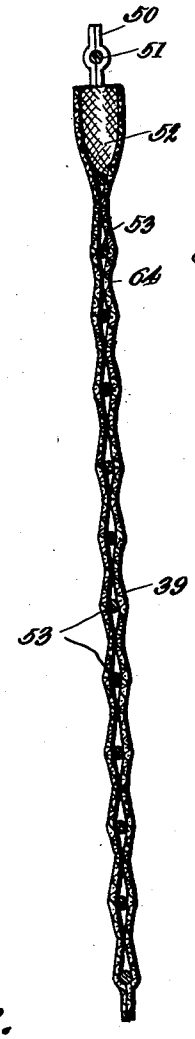


Fig. 7.

Fig. 8.



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UNITED STATES PATENT OFFICE

1,972,010

AIR COOLING DEVICE

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Application June 5, 1931, Serial No. 542,428

5 Claims. (Cl. 261—103)

This invention appertains to a novel device for properly conditioning and cooling the air of a building and railroad cars and has for one of its primary objects the provision of a compact and selfcontained apparatus for withdrawing the warm, foul air from a building and for properly cooling and filtering said air and redelivering the same to the building in a clean, cool condition.

Another important object of our invention is the provision of a novel device for cooling and conditioning air embodying a plurality of spaced transversely extending fabric screens through which the air is drawn with means for permitting a liquid, such as water, to seep down the fabric screens, whereby the air drawn through the screens will not only be properly moistened and filtered but will become cooled through the evaporation of the liquid seeping down the fabric screens incident to the flow of the hot air past the screens.

A further important object of our invention is the provision of a motor driven fan for drawing the hot air from a building or room through the fabric screens and expelling the air in a clean, cool condition, again into the building or room, the fabric screens having communication with a liquid supply tank so that a liquid can trickle down the screens, the excess liquid from the screens being caught in a receiving tank, a pump being operated by the motor fan for returning the water from the receiving tank to the supply tank.

A further important object of our invention is the provision of novel means for forming the fabric screens, each screen being of a substantially bag-like configuration, with novel means for suspending the same from the tank for permitting the trickling of water from the tank into the bag-like screen.

A further object of our invention is the provision of novel staggeredly arranged spacing elements formed between the walls of the bag-like screen so that the liquid will flow in a tortuous path down the screen.

A still further object of our invention is to provide an improved device of the above character which will be durable and efficient in use, one which will be simple and easy to manufacture, and one which can be replaced upon the market at a reasonable cost.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed and illustrated in the accompanying drawings, in which drawings—

Figure 1 is a front elevation of my improved air conditioning and cooling device.

Figure 2 is a central longitudinal section through the same.

Figure 3 is a horizontal section taken on the line 3—3 of Figure 2, looking in the direction of the arrows.

Figure 4 is a transverse section through my improved device taken on the line 4—4 of Figure 3, looking in the direction of the arrows.

Figure 5 is a side elevation of one of the novel fabric screens, showing parts thereof broken away and in section.

Figure 6 is a side elevation of one side of one of the front fabric screen members.

Figure 7 is a vertical central section through one of the rear fabric screen members taken on the line 7—7 of Figure 5.

Figure 8 is a transverse section taken through one of the rear fabric screen members on the line 8—8 of Figure 5, looking in the direction of the arrows.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter A generally indicates my improved apparatus which comprises an outer casing 10 which can be constructed from any preferred material and ornamented in any desired way to present an attractive appearance. As shown, the outer casing 10 embodies a base or bottom wall 11, a top wall 12, side walls 13, a front wall 14, and a rear wall 15. The rear wall 15 is provided with an enlarged opening 17, so as to permit the free flow of air into the casing and the front wall 14 is provided with an opening 20 to permit the exit of the air from the casing and into the house to be cooled. This opening 20 can be covered by a suitable grill or screen 21.

We prefer to arrange within the casing or housing 10, a metallic supporting frame 22 of which a bottom receiving tank 23 forms a part. This frame also supports a centrally disposed longitudinally extending reservoir or liquid distributing tank 24, and this tank 24 on each side of its longitudinal axis is provided with depending nipples 25. The sides of the tank 24 and the upper edges of the supporting metal frame can be provided with suitable supporting irons or flanges 26 and 27 respectively. The flanges 26 on the tank 24 are notched as at 28 and the flanges 27 can be provided with similar notches or openings 29, for a purpose which will be later set forth. If pre-

ferred, the side walls of the tank 23 can be provided with similar irons or flanges 30 which can be likewise notched.

Arranged adjacent to the front end of the casing and housed within the same is an electric motor 31 mounted upon suitable brackets 32 rigidly secured in place in any desired way. The armature shaft 33 of the electric motor has connected thereto a fan 34, the blades of which are so pitched as to draw the air within the casing, through the opening 17 and expel the air out of the casing through the opening 20. The armature shaft 33 of the motor 31 also operates any preferred type of rotary pump 35, the inlet of which extends into the bottom liquid tank 23. The outlet port of the rotary pump 35 has connected thereto a lead pipe 37 which delivers the water from the pump into the upper tank 24. The upper tank 24 may also be provided with an overflow pipe 36' which leads from the lowering receiving tank 23.

Arranged in rear of the fan 34 is a plurality of transversely extending fabric screens, certain of which we call the front screens indicated by the reference character 38 and certain of which we call the rear screens, indicated by the reference character 39. The screens 38 and 39 are of substantially the same construction and function in the same manner, the only difference being that the front screens 38 each embodies two companion side sections 40 for lying on opposite sides of the motor 31 and the rotary pump 35.

All of the screens are of a bag-like shape and it is to be noted that each section of the front screens includes front and rear walls 41 and 42 with a closed bottom 43. The top of each bag-like section carries an extension or upwardly extending wing 44 which carries a supporting rod 45, and these rods 45 engage in certain of the notches in the flanges or irons 26 and 27. Likewise, the lower end of each section can carry rods which can engage irons 30. Each section 40 is provided at its upper inner end with a mouth 46 for receiving certain of the depending outlet nipples 25. The receiving mouths can be clamped in position by the use of suitable clamping rings 47.

The front and rear walls 41 and 42 of each section are separated by wooden spacers 48 which are arranged in staggered relation so that the liquid entering the mouth 46 will flow in a tortuous path down the fabric screen and thus permit the fabric screen to be completely saturated by the liquid.

The rear screens 39 are of a unitary construction and extend entirely across the casing, and the upper edges of the rear fabric screens on each side of the vertical centers thereof are provided with wings 50 which carry the supporting rods 51 for engaging in the notches in the flanges or irons 26 and 27. On each side of the vertical center below the wings 50, the rear fabric screens are provided with inlet mouths 52 which are clamped to the depending outlet nipples by suitable clamping bands.

The front and rear walls of the rear screen member 39 are separated by staggeredly arranged wooden spacers 53 which permit the water or the liquid to flow from the upper tank down the said rear screen members in a tortuous path so as to permit complete saturation of said screen members. If preferred the walls of the bag-like screen section 39 can be sewed together at 64, above and below the spacing cleats 53 so as to hold these cleats in position. If desired, the extreme lower end of each fabric screen can carry a rod for engaging under the irons 30.

In the use of our improved device, an outlet exhaust pipe communicating with the desired building can be secured to the rear wall 16 for surrounding the front wall 17, while an outlet pipe leading to the inlet of the building can surround the opening 20. This is not necessary however, as the device can be placed directly in the room to be ventilated and cooled. The top tank 24 is filled with water or other desired liquid and this water trickles down the front and rear fabric screens 38 and 39 and completely saturates these screens, excess water dropping from the fabric screens to the lower tank 23. When the motor 31 is set in operation, the hot air will be sucked into the casing at the rear end thereof and drawn through the fabric screens 39 and 38 and out of the front of the casing. These screens will effectively moisten and purify the air, and the air will become cooled in view of the quick evaporation of water in the dry atmosphere, as the hot air passes over the moistened surfaces of the canvas bag or fabric screens, creating a refrigerating effect.

The evaporated water can be replaced by filling from the rear of the device, the bottom tank or reservoir.

The number of the hollow fabric bags or screens or the size thereof is not limited and it is to be understood that we can use any desired number and size.

We can also provide any preferred type of gauge 60 for indicating the height of the water in the tank and a thermometer can be used if desired.

From the foregoing description, it can be seen that we have provided an exceptionally simple, compact, and self-contained device for cooling and conditioning air in rooms for breathing purposes.

Changes in detail may be made without departing from the spirit or scope of this invention.

Having thus described the invention, what is claimed is:

1. A device for cooling air comprising a casing having an air inlet opening at one end and an air outlet opening at the opposite end, a plurality of bag-like fabric screens extending transversely across the casing between the openings, a liquid supply tank arranged in the upper end of the casing having depending nipples, the fabric screens having inlets receiving the nipples for permitting the liquid from the supply tank to flow into the fabric bag-like screens, a liquid receiving tank receiving the lower end of the screens, means for drawing air into the casing through the inlet opening through the screens and out of the casing through the outlet opening, and means arranged within the bag-like screen for guiding the liquid from the receiving tank in a tortuous path down said bag-like screens.

2. A device for cooling air comprising a casing having an air inlet opening at one end and an air outlet opening at the opposite end, a plurality of bag-like fabric screens extending transversely across the casing between the openings, a liquid supply tank arranged in the upper end of the casing having depending nipples, the fabric screens having inlets receiving the nipples for permitting the liquid from the supply tank to flow into the fabric bag-like screens, a liquid receiving tank receiving the lower end of the screens, means for drawing air into the casing through the inlet opening through the screens and out of the casing

through the outlet opening, and means arranged within the bag-like screen for guiding the liquid from the receiving tank in a tortuous path down said bag-like screens, and means for indicating the depth of the water in the receiving tank.

3. In a device for cooling air, a bag-like fabric screen having an opening for liquid at its upper end, and means between the walls of the bag-like screen for guiding the liquid flowing into the bag in a tortuous path down said bag.

4. In a device for cooling air, a casing having an inlet opening at one end and an air outlet opening at the opposite end, a longitudinally extending liquid receiving tank arranged centrally within the casing at the upper end thereof, flanges carried by the side walls of the tank having the notches therein, supporting members carried by the inner faces of the side walls of the casing having notches therein, a plurality of bag-like fabric screens arranged transversely of the casing between the openings, means for drawing air into the casing through the inlet opening past the screens and out of the outlet opening, each of said bag-like screens having upwardly extending wings and inlet openings adjacent to the wings communicating with the tank, and rods carried by the wings detachably fitted within the notches of said flanges and supporting members.

5. A device for cooling air comprising a casing having an air inlet opening at one end and an air outlet opening at the opposite end, a plurality of bag-like fabric screens in the casing between the openings, a liquid supply tank arranged in the upper end of the casing having depending nipples, the fabric screens having inlets receiving the nipples for permitting the liquid from the supply tank to flow into the fabric bag-like screens, a liquid receiving tank receiving the lower end of the screens, means for drawing air into the casing through the inlet opening through the screens and out of the casing through the outlet opening, and means arranged within the bag-like screen for guiding the liquid from the receiving tank in a tortuous path down said bag-like screens.

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