(No Model.)

W. V. WALLACE.

AIR COOLING DEVICE.

No. 297,476. Patented Apr. 22, 1884.

Fig. 2.

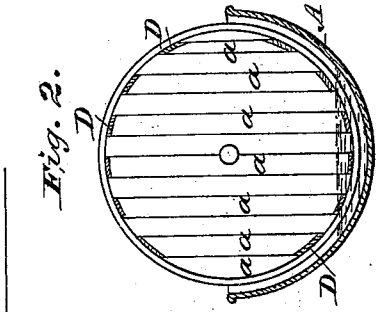


Fig. 3.

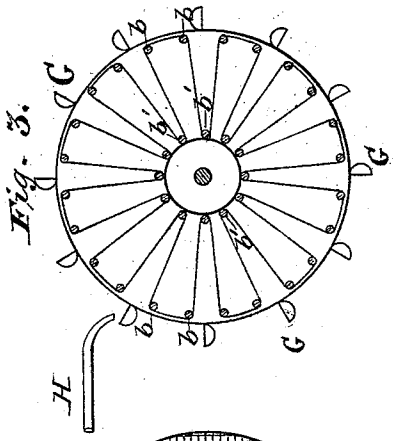


Fig. 4.

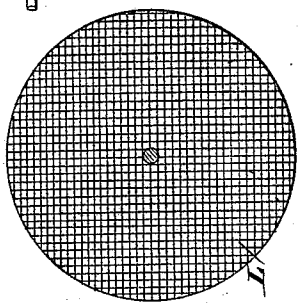


Fig. 1.

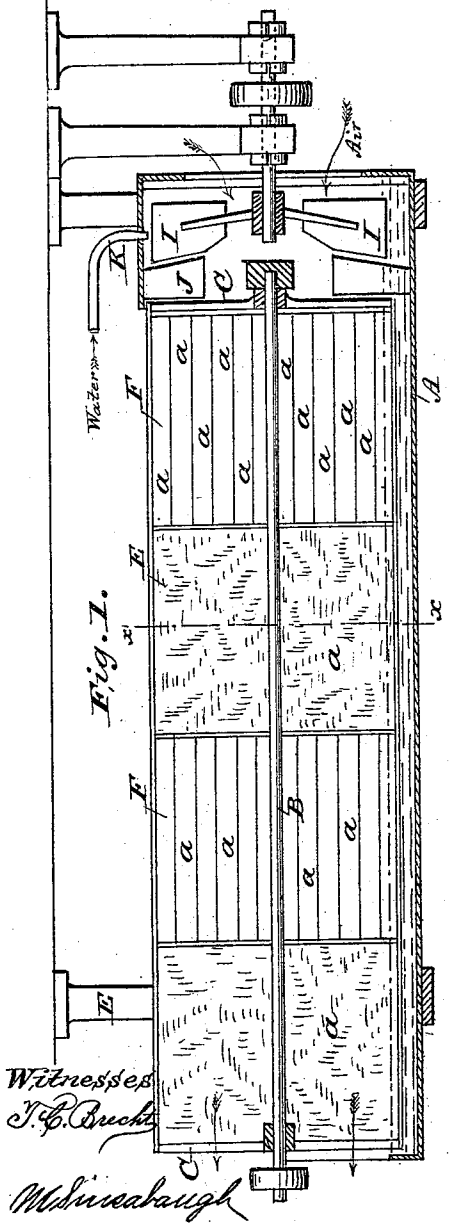
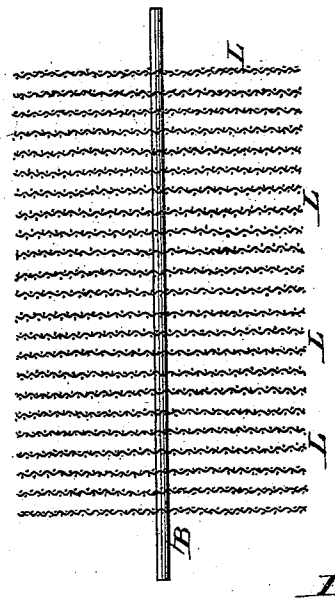


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM V. WALLACE, OF BOSTON, MASSACHUSETTS.

AIR-COOLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 297,476, dated April 22, 1884.

Application filed March 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM V. WALLACE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Air-Cooling Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in devices for cooling, moistening, and purifying the air in factories, sick-rooms, and other places where pure, fresh air and a low temperature are required.

Figure 1 is a longitudinal sectional view of my improved device. Fig. 2 is a cross-section on the line *x x*, Fig. 1. Fig. 3 is an end view of a modified form of construction. Figs. 4 and 5 are side and end views of wire disks mounted on a shaft and adapted to be rotated, as will more fully appear.

In the cooling of rooms and other apartments by artificial means, especially by means of currents or blasts of air passing over wet or moist surfaces, it is desirable to have as large an evaporating-surface as possible confined within a small space, and at the same time have freshly moistened or wet surfaces constantly presented to the action of the air blast or blasts. I accomplish this in the following manner and by means of the following devices:

A is a trough or cylinder, in which is mounted a shaft, B, adapted to be revolved in its bearings by any suitable means.

C is a drum or cylinder, which may be covered with cloth, wire, or other textile or water-absorbing material, suitably connected to the shaft B, so as to be revolved therewith. The cylinder C may be incased by an outer shell of wood, metal, or other suitable material. The interior of the cylinder C is provided with a series of slats, D, over which is stretched, or to which is secured, fibrous or woven material or perforated sheet metal, wood, or other water conducting or absorbing material, so as to form partitions *a*. The fibrous or porous partitions *a* are divided into sections E and F, the fibrous or water-conducting surfaces *a* in the section E being placed in parallel rows and at right angles to the partitions in section F, so that the air will be driven alternately between horizontal and vertical walls of the water-saturated material, so that every portion of the air will be brought in contact with the wet surfaces of the partitions, the alternate arrangement of the partitions tending to separate and divide up the air-currents more effectually.

A is a trough or shell, in which the cylinder revolves, and may be adapted to hold water in its lower portion, so that when the cylinder C is revolved therein the fabric or water-absorbing partitions will be saturated or coated with a fresh supply of water, and the air, in its passage through or between the partitions, will be cooled, moistened, and precipitated into the room or apartment in this condition.

In many locations—as in factories, shops, &c.—where dirt, dust, lint, oil, grease, &c., are liable to be drawn in by the fan or blower and mixed with the water, it may not be desirable to have an accumulation of water in the trough A, and to obviate the necessity of wetting the partitions by the foul water in the trough I employ other devices for wetting or saturating the partitions, which will be more fully hereinafter described.

The shaft B, which carries the cylinder and the diaphragms or partitions of fibrous or water-conducting material, as before stated, is free to revolve in suitable bearings, and the rotary motion may be imparted to the same by the action of the fan-blower on the same. I prefer, however, to revolve the cylinders by means of troughs or buckets G, secured to the periphery of the drum or cylinder and adapted to be filled with water from a spout or pipe, H. By this arrangement the troughs or buckets G will be filled with pure, fresh water, overflow and saturate the fabric or other material of which the partitions are composed, and will, perhaps, fill another bucket or two with the overflow of water. The weight of water thus brought on one side of the cylinder will put it in motion and turn the cylinder part way round, or until the buckets or troughs begin to ascend and empty themselves. The cylinder will then stop until other troughs or buckets are filled, when the cylinder will be put in motion again and partially rotated. By this

means the number of revolutions imparted to the cylinder are controlled or regulated by the amount of water let into the troughs or buckets. The trough A, or lower portion of the case in which the cylinder or drum C is revolved, will be provided with a suitable waste-pipe for conveying away the surplus water. Enough water may, however, be left in the trough A to keep the partitions or diaphragms at all times wet or moist.

I do not wish to limit myself to the exact devices shown and described in the construction of the cylinder C. Burlaps or any other coarse cloth wound round the entire cylinder, with water let on in small streams at intervals of a few inches apart horizontally, will revolve intermittently a well-balanced cylinder, at the same time thoroughly wetting all its inner surfaces. Folds may be sewed in the cloth, thus increasing the evaporating-surface, and at the same time serving to increase the motion of the cylinder.

I is a fan-blower mounted on a shaft in the end of the cylinder or trough A, by which currents of air are forced through the cylinder or drum C, and between the wet surfaces of the fabric or other water absorbing or conducting material, said fan-blower being driven by any suitable means. The casing in which the fan-blower is located is provided with cut-offs J, which serve to deflect or conduct the air into the cylinder, and the fan-blades are set at an angle and made of the form shown, for the same purpose.

K is a water-pipe, by which a jet or spray of water is thrown upon the blades of the fan-blower, thus keeping them moist and utilizing them as an evaporating-surface; but I do not claim in this application this feature, as it is embraced in an application filed even date herewith, Serial No. 122,970.

In Fig. 3 I have shown a modification, and in this instance the drum or cylinder is provided with a series of rods or bars, *b*, near its periphery, and also a series of rods, *b'*, near its axis of rotation. The woven fabric or other material is intertwined or wound around these bars, as shown, so as to form spaces between the walls of the fabric for the passage of air; and by this construction I am enabled to get a very large evaporating-surface.

A cylinder of the construction just described is also adapted to be revolved, as in the former instance, and may be provided with the troughs or buckets, as before described.

In Fig. 4 I have shown an end view, and in Fig. 5 a side view, of a series of disks or wheels, L, of wire-gauze or other suitable material, mounted on a shaft, B, and adapted to be rotated, as in former instances. These disks may also be provided with troughs or buckets and arranged to revolve in a trough or cylinder in the manner above indicated.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a device for cooling, moistening, and purifying air, a cylinder adapted to be rotated, provided with a series of compartments, the walls of which are formed of fabric, perforated or water absorbing or conducting material, said compartments being adapted to have currents of air passed therethrough, as and for the purpose set forth.

2. An air cooling and moistening device composed of a cylinder having compartments or passages formed therein by means of fabric or other water-conducting material arranged as described, said cylinder being adapted to be slowly rotated in a trough or outer casing containing water, in combination with a fan-blower or other air-forcing device, as and for the purpose set forth.

3. In an air-cooling device, a cylinder composed of a series of sections, said sections being provided with a series of air-compartments arranged vertically and horizontally, alternating at right angles to each other, the walls of said compartments being formed of canvas or other water conducting or absorbing material, as set forth.

4. In an air-cooling device, a cylinder covered with woven or reticulated material, and having internal compartments or ducts for the passage of air, said cylinder being adapted to be rotated and partially submerged in water, as set forth.

5. In an air-cooling device, a cylinder mounted in suitable bearings and provided on its periphery with a series of troughs or buckets adapted to receive and hold water poured therein, whereby said cylinder is caused to rotate with an intermittent motion, as set forth.

6. An air-cooling device consisting of a cylinder or compartment having air-passages therethrough formed of woven fabric, by winding or passing the same around bars or slats arranged near to and parallel with the axis and periphery of the cylinder, as set forth.

7. In an air-cooling device, a cylinder or compartment provided with a series of diaphragms of woven material adapted to be saturated with a cooling-liquid, in combination with a fan-blower adapted to rotate in a direction at right angles to the axis of the cylinder, and cut-offs or deflectors arranged near the fan-blower, whereby the air-currents are directed in straight lines into the cylinder and between the saturated surfaces of the fabric, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM V. WALLACE.

Witnesses:
GEO. R. FOWLER,
F. J. BAXTER.