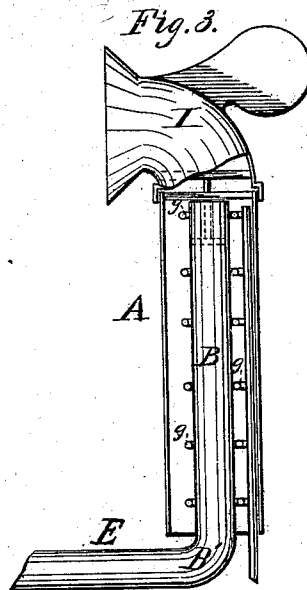
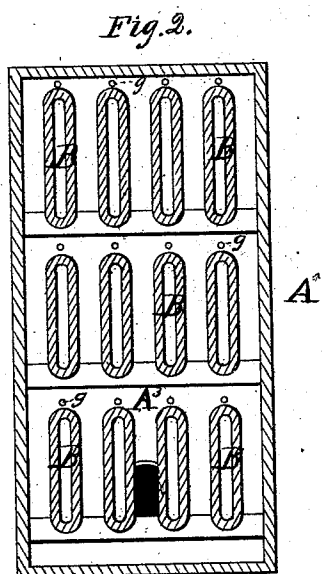
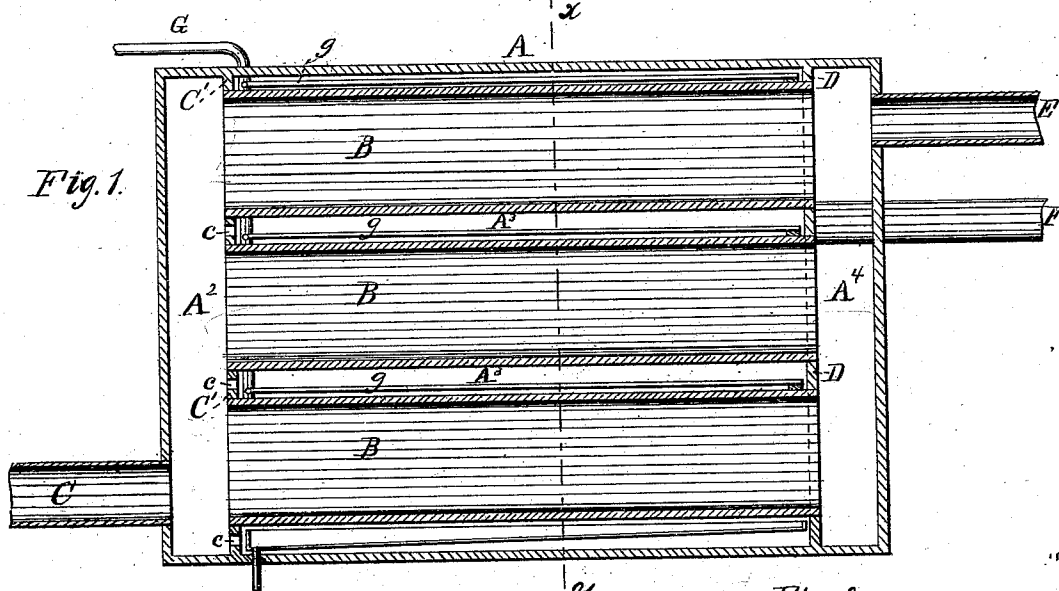


W. S. WILKINSON.
Apparatus for Cooling Air.

No. 225,192

Patented Mar. 2, 1880.



Witnesses:
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J. S. Barker.

Inventor:
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UNITED STATES PATENT OFFICE.

WALTER S. WILKINSON, OF BALTIMORE, MARYLAND.

APPARATUS FOR COOLING AIR.

SPECIFICATION forming part of Letters Patent No. 225,192, dated March 2, 1880.

Application filed May 12, 1879.

To all whom it may concern :

Be it known that I, WALTER S. WILKINSON, of Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Apparatus for Tempering Air; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved method of ventilation and of tempering the air which is supplied to apartments and buildings.

The object of the invention is to produce a desired temperature in a current or volume of air by means of another current or volume of air caused to pass around the duct or ducts through which is conveyed the air which is to be tempered.

In carrying out my invention I preferably divide a column of air into two or more parts or currents, one of which is caused to remove the heat from the other, and to then escape through suitable exhausting devices, the cooled current being employed for ventilation, and being conveyed to any desired points. The air which is to be used for ventilation is passed through an inner pipe, around which is placed an outer pipe or casing of suitable dimensions, and adapted to form a chamber or open space between the inner pipe and the casing or outer pipe. The cooling-current passes through this chamber or open space around the ventilating-duct and withdraws the heat from the air therein.

To cause the cooling of the air, water is supplied to the outside of the ventilating pipe or duct, which is thus kept constantly moist. The evaporation of this moisture of the outer current of air withdraws the heat from the duct and from the current of air passing through it, as will be readily understood.

The wind or the natural movements of the air may be utilized to cause the passage of air through the tempering devices; or said passage may be caused by any of the suction, blast, or exhaust mechanisms that are employed for such purposes; and said mechanism may be located at any desired point, ac-

cording as convenience or occasion may dictate. Thus, a force or blast fan or a cowl may be arranged to operate upon the air as it is being first supplied to the apparatus; or the ventilating-current and the cooling-current may, after performing their respective operations, be conducted to a common exhaust-shaft provided with an exhaust-fan, cowl, or with a steam-jet; or the two currents may be respectively supplied with a separate exhausting device.

In the drawings I have shown some of the methods of carrying out my invention.

Figure 1 is a vertical section of a cooling and ventilating mechanism embodying my invention. Fig. 2 is a transverse section taken on line *xy* of Fig. 1. Fig. 3 illustrates my invention when a single cooling-pipe is employed.

In the drawings, A is a casing adapted to form a tight chamber and to contain devices for supporting one or more pipes, B B. Air is introduced into this chamber through a supply-pipe, C, communicating with it at any desired point, though I prefer to connect it at the bottom of the casing, in order that the air may traverse as much as possible of the body of the inclosed chamber.

D represents a partition or wall within the casing A.

The pipes B B are supported at one end in this partition, and it should be air-tight, except at the ends of the pipes. The pipes are supported at the opposite ends by means of bars or sills C' C', which are situated at suitable distances from the end of the casing. Instead of the bars or strips a wall or partition may be used to support the pipes, in which case perforations or apertures *cc* should be formed therein to permit the passage of air. It will be seen from Fig. 1 of the drawings that there are thus within the casing A three apartments or chambers, formed as shown at A² A³ A⁴; and it will be further seen that there is no communication for the air between the compartments A² A⁴ except through the pipes B B.

E represents a duct for conducting to the building or apartments to be ventilated the air which passes through said pipes B B and the chamber A⁴.

F is an exhaust-pipe for withdrawing the air from the central compartment, A³. It projects across the chamber A⁴ and opens into the inner compartment.

5 The pipes B B are preferably constructed substantially of the shape shown in Fig. 2—that is to say, as nearly flat as is practicable—in order to have a large cooling-surface in proportion to the volume of air that passes
10 through them.

G is a water-pipe connected with any convenient reservoir, and adapted to distribute water over the surfaces of the pipes B B, which can be conveniently accomplished by means of branch pipes *g g*, situated, respectively, above the air-pipes B B. These ventilating-pipes may be constructed of any suitable material; but in order to obtain the best results they should either be porous upon their
15 outer surfaces or be surrounded by some porous material, in order to better distribute the moisture. Thus they may be formed of iron or other metal, and be surrounded with jackets of cloth, felt, or other absorbing material,
20 or they may be constructed of clay or terracotta, and when these materials are used the inner surface of the pipe should be vitrified in order to be smooth; but the outer surface should be left porous to facilitate the moistening of the pipe.
30

A drip-receptacle may be placed in the bottom of the casing to catch the water that passes below the pipes, and the waste-water may be withdrawn by any suitable devices.

35 From the drawings and the foregoing description it will be seen that if the volume of air be caused to pass into the casing A through the pipe C it (said volume of air) will be divided into two currents or sets of currents, of which one will traverse the pipes B B, the
40 chamber A⁴, and the duct E, and that the other will pass beyond the bars or sills C' into the space or compartment A³, around the pipes B B, and thence into the exhaust-pipe F; and it will be further seen that if the pipes B B are moistened upon the outside by the water fed from the pipes G *g* the warm air that passes through the compartment A³ around the air-pipes will cool the air within said pipes
45 by taking up the moisture on their surfaces.
50

When a construction of the nature shown in Figs. 1 and 2 is used, it may be located in any part of the building to be ventilated, though I have found it desirable, for some reasons, to place it at the top or upper part of the structure rather than in the lower, as the air met with at the tops of buildings, especially in cities, is more advantageous for ventilating than that found nearer the ground.

60 It may be sometimes desirable to provide a single apartment with a ventilating apparatus of the kind described, in which case the apparatus may be placed directly in said apartment, and the pipe E may be dispensed with, the cool air being delivered through a suitable aperture in the wall of the casing. This aper-
65

ture should be provided with a door or dampers, as should also the duct through which the cooling-air is exhausted, in order to regulate the volumes of air relative to each other.
70

In Fig. 3 I have shown a ventilating device embodying my invention in which but one air-pipe is used. In this case a volume of air is forced down into the outer casing or tube, A, and into the inner pipe, B. A supply of water for evaporation is effected by the feed-pipe G and the branch pipes *g g*, situated at convenient distances around the ventilating-pipe.
75

I represents a cowl of any desired construction, whereby the air is forced downward into the pipes. The pipe B is turned, as at B', to carry the cooled air to any desired point. The air which passes through the outer pipe escapes at the bottom, which is left open for
80 that purpose.
85

It will be seen that the inner duct, B, operates as a partition within the outer duct or chamber, A, to divide the air into two currents, and also that the ducts B and E serve as a passage for the inner current.
90

Constructions similar to that shown in Fig. 3 are especially adapted to be used upon the outside of buildings, to the walls of which they can be conveniently attached.
95

I do not wish, however, to limit myself to the exact details of construction which I have shown and set forth, inasmuch as the essential features of my invention may be carried out by devices of a modified character, which will readily suggest themselves to those familiar to the art to which they appertain.
100

This system of ventilating and tempering air may be readily applied to cars, boats, ships, and other moving apartments. When applied to such structures the passage of the air through the cooling apparatus would be caused by the motion of the structure, as will be readily understood.
105

By constructing the apparatus so that it shall divide a single current of air into the two or more currents necessary to carry out my invention I am enabled to produce all of the required movements by a single forcing apparatus.
110

What I claim is—
115

1. The combination of an outer air-conduit, a conduit partly or entirely within said outer conduit, and air-forcing mechanism which supplies both conduits with air from a single current, substantially as set forth.
120

2. A moistened duct through which air passes into a room or structure from the outside of said room or structure, in combination with an air-forcing mechanism which passes a current of air around said moistened duct.
125

3. In combination with an inner duct, an outer duct or chamber, into which a current of air is forced, and a partition which divides the air into two independent currents.
130

4. In an air-cooling apparatus, a chamber having an outlet, E, for a ventilating-current,

another outlet, F, for an evaporating and cooling current, and an inlet at which both currents are received together, substantially as set forth.

- 5 5. A duct or chamber, A, divided into two compartments, A² A⁴, of which each has a separate air-exit, by a partition, D, which is provided with an air-passage, substantially as set forth.

In testimony that I claim the foregoing as 10
my own I affix my signature in presence of
two witnesses.

WALTER S. WILKINSON.

Witnesses:

JAS. HENDERSON,

JAMES C. G. UNDUCH.