B. MACFADDEN & E. L. MOUMBLOW.

COOLING AND VENTILATING APPARATUS.

APPLICATION FILED JUNE 21, 1916.

1,228,939.

Patented June 5, 1917.

2 SHEETS—SHEET 1.

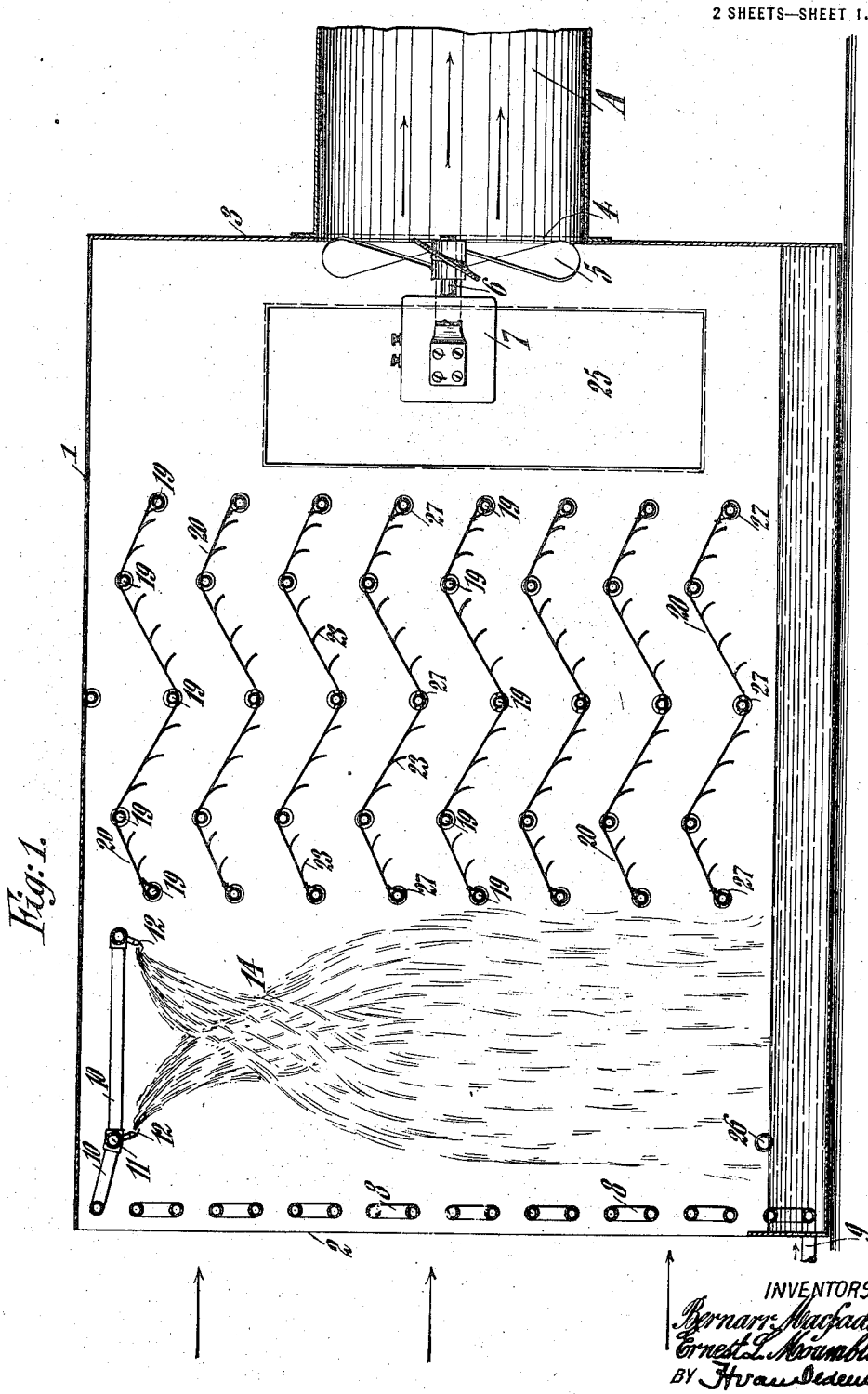


Fig. 1.

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Fig. 4.

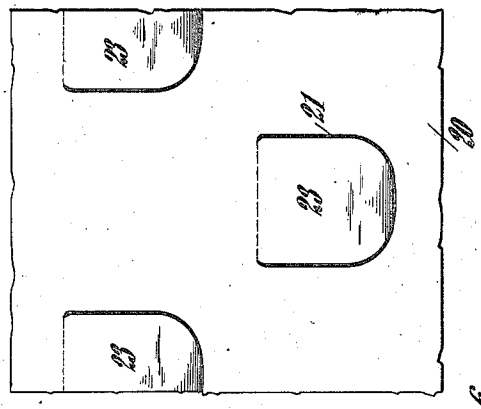


Fig. 6.

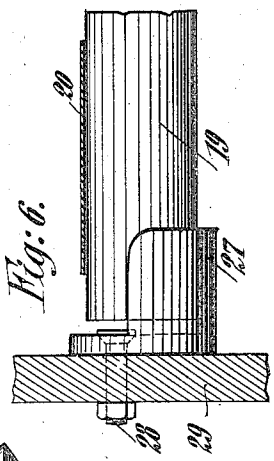


Fig. 3.

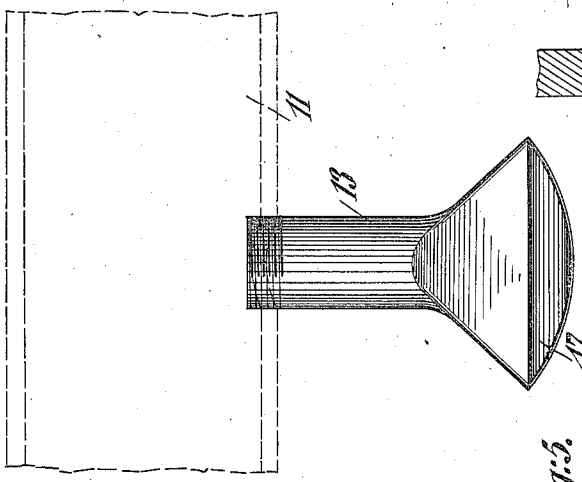


Fig. 5.

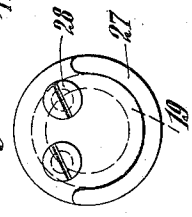
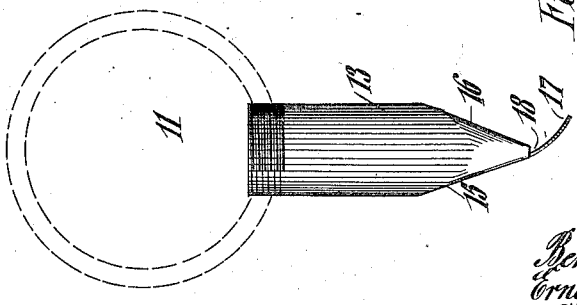


Fig. 2.



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BERNARR MACFADDEN AND ERNEST L. MOUMBLOW, OF NEW YORK, N. Y.; SAID MOUMBLOW ASSIGNOR TO SAID MACFADDEN.

COOLING AND VENTILATING APPARATUS.

1,228,939. Specification of Letters Patent. Patented June 5, 1917.

Application filed June 21, 1916. Serial No. 104,995.

To all whom it may concern:

Be it known that we, BERNARR MACFADDEN and ERNEST L. MOUMBLOW, citizens of the United States of America, residing, respectively, in the borough of Manhattan, city, county, and State of New York, and in the borough of Richmond, county of Richmond, State of New York, have invented new and useful Improvements in Cooling and Ventilating Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to a device for cooling and ventilating, and is particularly adapted for use in connection with restaurants, public halls and like places, where the problem of ventilating and cooling has always been a serious one.

The main object of the invention is to provide a novel, simple, efficient and most economical apparatus for ventilating and cooling.

Among other novel features, the device comprises the use of combined evaporators and eliminators, which have heretofore not been used in devices of this nature. The use of such combined evaporators and eliminators aids materially in obtaining the desired result, namely the cooling of the air to be used for ventilating. Up to the present, many persons have been striving to accomplish the result obtained by this invention, but have all been singularly unsuccessful. However, by the use of the combined evaporators and eliminators, the inventors of this device have not only solved the very perplexing problem of cooling and ventilating, but have also produced a structure which is most economical to install, as well as being the most efficient of its kind.

In the drawings, which are for illustrative purposes only and not drawn to any particular scale:

Figure 1 is a vertical sectional view of the apparatus;

Figs. 2 and 3 elevations of the spray-nozzles;

Fig. 4 is a detail view showing the flaps in the combined evaporators and eliminators; and

Figs. 5 and 6 are fragmental side elevations showing a suitable form of bracket for supporting the bars which carry the combined eliminators and evaporators.

Referring now more particularly to Fig. 1, a box or casing 1 having an open end 2 and a rear wall 3 contains the various parts of the device. The said rear wall 3 is provided with an outlet opening 4 in which is mounted a fan or blower 5 driven by a shaft 6 connected to a motor 7, the purpose of said fan being to draw air through the box and to discharge the cooled air into the conduit A, through which it is then conducted to any desired place.

At its open end, the box or casing is provided with a coil 8, which is connected at one end by a pipe 9 to a supply of iced water or other source of water supply (not shown). At its other end, the coil is connected by pipe 10 to supply pipes 11 carrying spray nozzles 12. Each nozzle, 12, is composed, as shown in Figs. 2 and 3, of a body portion 13, one end of which is connected to the supply pipes, its free end being formed so as to discharge water in the form of spray in the spray chamber 14. This is accomplished by having the free end of the body portion flattened to form sides 15 and 16, these sides converging and almost touching at the free edges, and having one side 15 elongated and curved forming a lip 17, thus leaving a long narrow slit or mouth 18 for the discharge of the water.

As will readily be seen, in order to escape, the water must first pass through the slit 18 and then strike the overhanging lip, and is discharged in the form of spray. As will be noted, the arrangement of the nozzles is such that the sprays from the various nozzles will intermingle in the spray chamber.

Within the casing 1, disposed one above the other, are substantially horizontal groups of transverse bars or supports 19, the bars of each group being arranged in substantially staggered relation. The groups of bars carry, in a wave or serpentine-like manner, the combined evaporators and eliminators 20, which have a most important function in this apparatus.

Such combined evaporators and eliminators may be composed of any desired material, such as felt, which readily becomes saturated with water carried over from the spray, whence the water is evaporated and materially assists in the cooling of the air passing over the combined evaporators and eliminators. To better effect the evaporation, U-shaped slits 21 are made in the felt of the eliminators, thus forming openings

provided with flaps 23 (Fig. 4). The provision of openings with flaps in the eliminators, as well as the wave-like form thereof, causes the air passing through to have a very close contact with the eliminators, and thus aids greatly in the evaporation.

For purposes of inspection or repair, the casing is provided with a door 25.

In order to carry off any excess of water from the bottom of the casing, an outlet 26 is provided.

The inclination and number of the eliminators 20 will depend upon the required temperature, humidity and volume of the air to be passed through the apparatus and on the capacity of the fan 5. Therefore, in order to make it possible to adjust the inclination and number of the eliminators to meet different conditions under which the apparatus may be used, it is desirable to provide an adjustable mounting for the bars 19, so that they may be secured at any desired place to the side walls of the casing 1.

To this end, I provide adjustable brackets 27 (Figs. 5 and 6) which by means of bolts 28 or screws may be detachably secured to any desired part of the sidewall 29 of the casing, and serve to receive the ends of the bars 19. Of course, other convenient adjustable supporting means may be used instead of the brackets 27.

The operation of the device is as follows:—

The water being turned into the coil 8 and the fan started, the air is drawn into the box over the coil, thus being somewhat cooled, and is then drawn through the spray chamber and treated with the cold spray and further cooled. It is then drawn over the combined evaporators and eliminators, which become saturated with the water carried by the current of air, and subsequently this water is evaporated, thus still further cooling the air. The cooled air is then drawn into the conduit A and conducted to any desired place.

As will be seen, this invention has many novel points heretofore unknown in cooling and ventilating devices, but it is to be understood that the applicants do not desire to be limited to the details shown in the drawings, as such are merely for illustration. Many modifications may be used in this device without departing from the scope of the applicants' invention.

We claim as our invention:

1. In a ventilating and cooling device, the combination of a casing open at one end and having an outlet at the other; means for producing a water spray near the open end of the casing; a group of combined eliminators-and-evaporators composed of absorbent material and disposed one above the other between said spray and said outlet and forming therebetween a series of sinuous paths open throughout and leading from said spray toward said outlet; and means for causing a draft of air through said casing.

2. In a ventilating and cooling device, the combination of a casing; means for producing a water spray in the casing; a group of combined eliminators-and-evaporators disposed in a series one above the other and each composed of a layer of absorbent material extending from side-to-side of the casing and arranged in zig-zag fashion, adjacent eliminators-and-evaporators forming zig-zag paths open throughout and leading from said spray; and means for causing a draft of air through said spray and thence through said paths.

3. In a ventilating and cooling device, the combination of a casing; means for producing a water spray therein; a group of combined eliminators-and-evaporators extending from side-to-side of the casing and extending in a series one above the other, each being composed of a layer of absorbent felt arranged in zig-zag fashion longitudinally of the casing and forming with the adjacent layer a zig-zag path open throughout and leading from said spray; and means for causing a draft of air through the spray and said paths.

4. In a ventilating and cooling device, the combination of a casing open at one end and having an outlet at the other; a series of coils extending over the open end of the casing; a nozzle connected to said coils for producing a water spray near the open end of the casing; a group of combined eliminators-and-evaporators composed of absorbent material and disposed one above the other between said spray and said outlet and forming therebetween a series of sinuous paths open throughout and leading from said spray toward said outlet; and means for causing a draft of air to pass over said coils, through said spray and thence through said paths to said outlet.

5. In a ventilating and cooling device, the combination of a casing; means for producing a watery-spray therein; a group of combined eliminators-and-evaporators extending from side-to-side of the casing and extending in a series one above the other, each being composed of a layer of thick absorbent material arranged in zig-zag fashion so as to form inclined portions provided with U-shaped cut-outs forming flexible flaps, adjacent layers forming zig-zag paths open throughout and leading away from said spray; and means for forcing air through said spray and thence through said paths.

6. In a ventilating and cooling device, the combination of a casing; means for producing a water-spray therein; a group of combined eliminators-and-evaporators extending from side-to-side of the casing and ex-

tending in a series one above the other, each being composed of a layer of thick absorbent material arranged in zig-zag fashion so as to form inclined portions of about thirty degrees to the horizontal, adjacent layers forming zig-zag paths open throughout and leading away from said spray; and means for forcing air through said spray and thence through said paths.

7. In a ventilating and cooling device, the combination of a casing; means for producing a water-spray therein; a group of combined eliminators-and-evaporators extending from side-to-side of the casing and extending in a series one above the other, each being composed of a layer of thick absorbent material arranged in zig-zag fashion so as to form inclined portions of about thirty degrees to the horizontal, provided with U-shaped cut-outs forming flexible flaps, adjacent layers forming zig-zag paths open throughout and leading away from said spray; and means for forcing air through said spray and thence through said paths.

8. In a ventilating and cooling device, the combination of a casing; means for producing a water-spray therein; a group of combined eliminators-and-evaporators extending from side-to-side of the casing and extending in a series one above the other, each being composed of a layer of thick absorbent material arranged in zig-zag fashion so as to form inclined portions, adjacent layers forming zig-zag paths open throughout and leading away from said spray; means for forcing air through said spray and thence through said paths; and adjustable means for supporting said layers.

9. In a ventilating and cooling device, the combination of a casing; means for producing a water-spray therein; a group of combined eliminators-and-evaporators extending from side-to-side of the casing and extending in a series one above the other, each being composed of a layer of thick absorbent material arranged in zig-zag fashion so as to form inclined portions adjacent layers forming zig-zag paths open throughout and leading away from said spray; means for forcing air through said spray and thence through said paths; rods supporting said layers; and brackets receiving said rods and adjustably securing them to the walls of the casing.

In testimony whereof, we have signed our names to this specification.

BERNARR MACFADDEN.
ERNEST L. MOUMBLOW.