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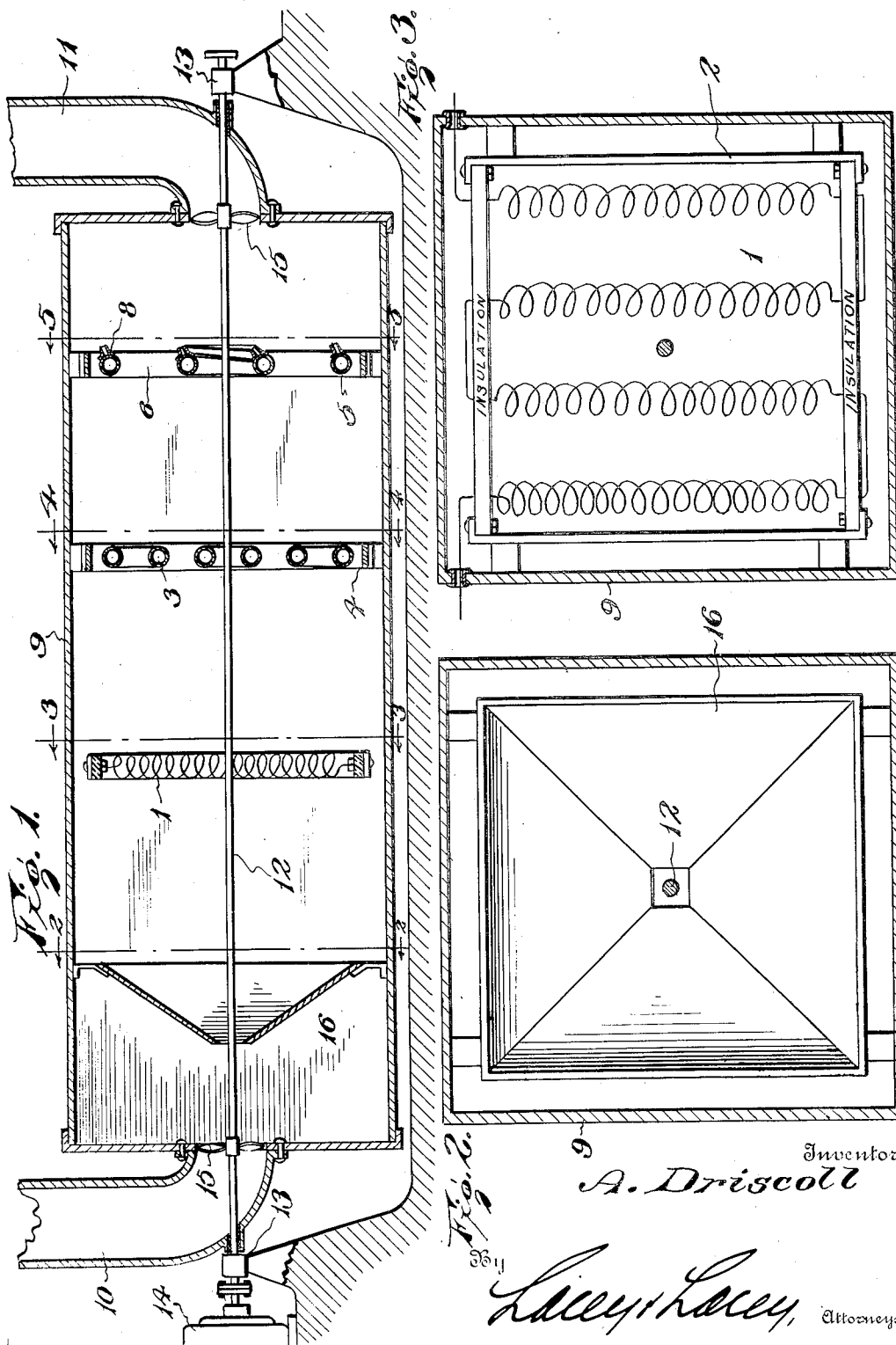
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1,821,297

COOLING, HEATING, VENTILATING, AND HUMIDIFYING SYSTEM

Filed Oct. 1, 1928

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

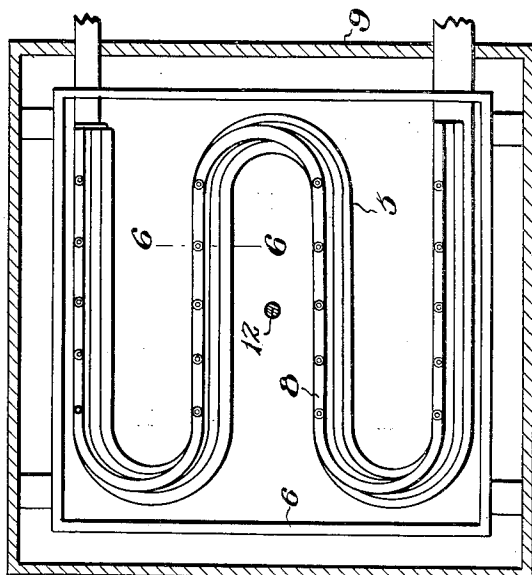


Fig. 5.

Fig. 6.

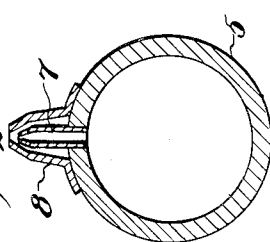


Fig. 7.

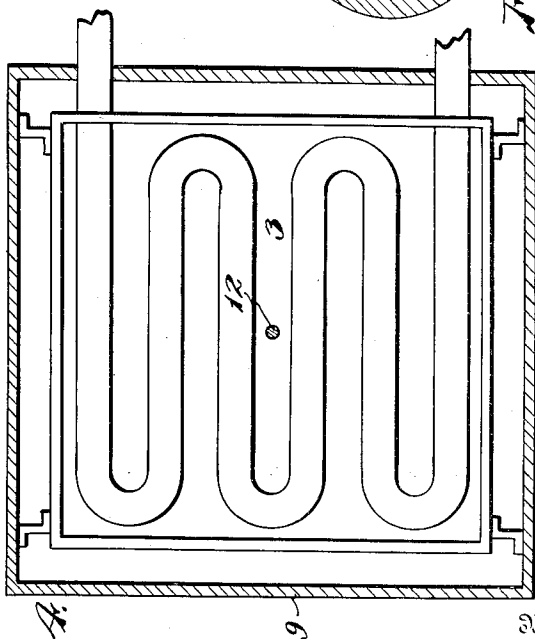
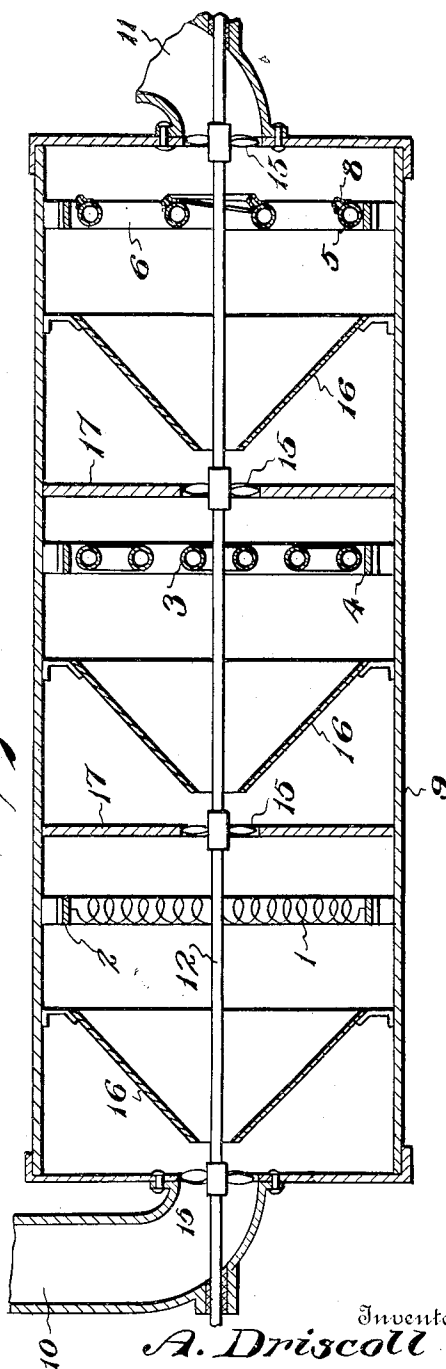


Fig. 8.



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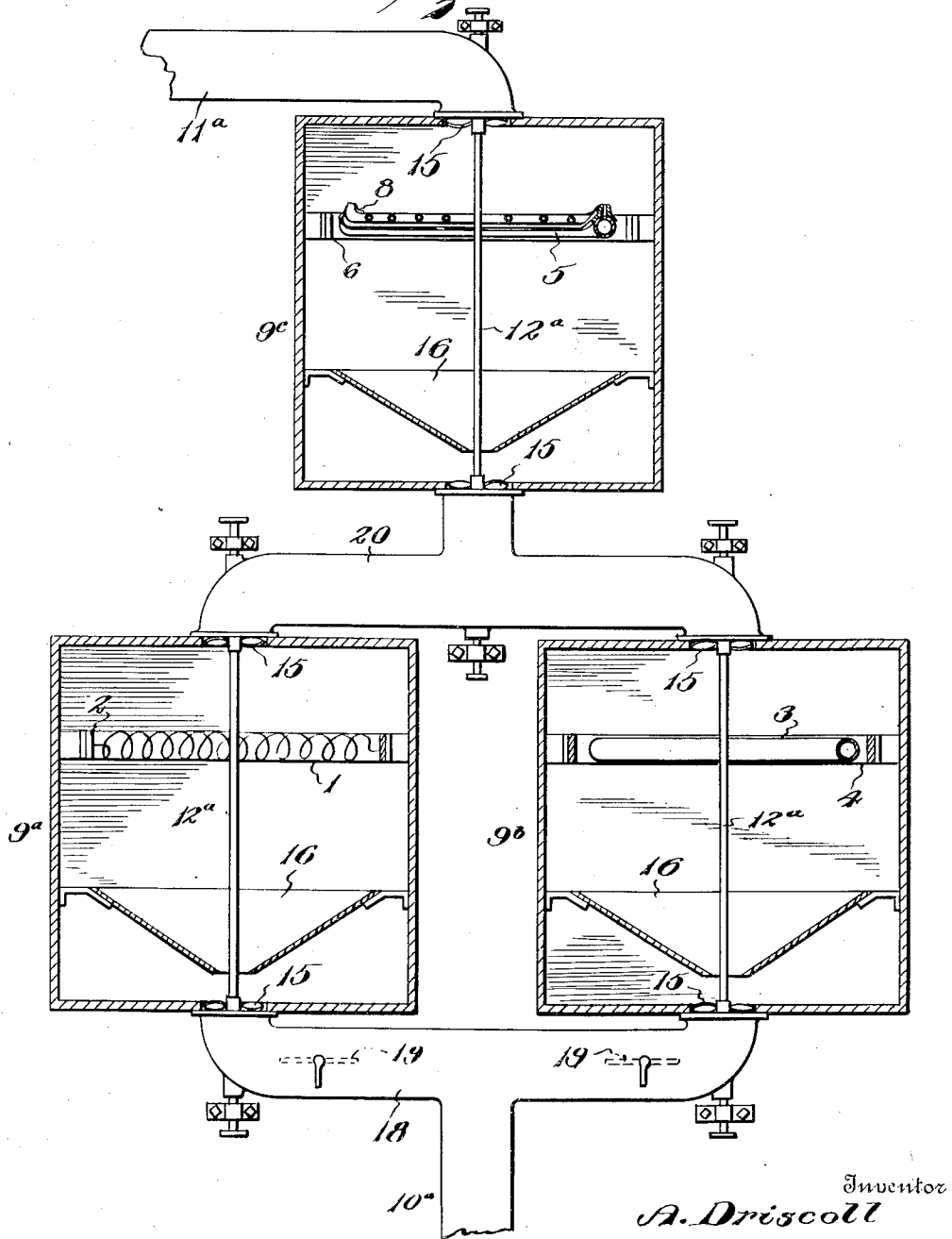
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Fig. 8.



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UNITED STATES PATENT OFFICE

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COOLING, HEATING, VENTILATING, AND HUMIDIFYING SYSTEM

Application filed October 1, 1928. Serial No. 309,429.

The invention contemplates tempering and modifying the air of dwellings, large and small, public places of assembly, such as halls, churches, theaters, and carriers including cars, ships and air craft, whereby to heat, cool, ventilate and humidify as occasion may require.

The invention provides an apparatus for attaining the purposes aforesaid which is compact, capable of being economically operated, controllable from any determinate and convenient point and which admits of impregnating the air with a perfume or other substance according to the ultimate result to be effected.

The invention combines in a single organization means for creating a positive circulation of air, means for heating or cooling the air while in motion, and an atomizer for moistening and impregnating the air with a perfume or other substance.

While the drawings illustrate a preferred embodiment for the invention, it is to be understood that in adapting the means to meet specific needs and requirements, the design may be varied and changes in the minor details of construction may be resorted to within the scope of the invention, as claimed, without departing from the spirit thereof.

For a full understanding of the invention and the merits thereof, reference is to be had to the following description and the drawings hereto attached, in which:—

Figure 1 is a central longitudinal sectional view of an apparatus illustrative of an embodiment of the invention.

Figure 2 is an enlarged transverse sectional view on the line 2—2 of Figure 1 looking to the left as designated by the arrows.

Figure 3 is an enlarged sectional view on the line 3—3 of Figure 1.

Figure 4 is a sectional detail on the line 4—4 of Figure 1 showing the parts on a larger scale.

Figure 5 is a transverse sectional view on the line 5—5 of Figure 1 showing the parts on the same scale as Figures 2, 3 and 4.

Figure 6 is an enlarged detail sectional view on the line 6—6 of Figure 5.

Figure 7 is a view similar to Figure 1 of a modification.

Figure 8 is a sectional view of a further modification.

Corresponding and like parts are referred to in the following description and designated in the several views of the drawings by like reference characters.

The apparatus includes a housing for enclosing the component parts and this housing may consist of a single casing, as shown in Figures 1 and 7 of the drawings, or a sectional casing as indicated in Figure 8, each of the sections enclosing the coordinate parts for heating, cooling, or humidifying the air.

The numeral 1 designates the heater which preferably consists of an electric unit including a suitable supporting frame 2 and a resistance element such as a coil of wire. This electric heater may be supported within the casing in any determinate way to insure a warming of the air positively circulated through the casing.

The cooling unit comprises a coil 3 and supporting frame 4 and is mounted within the casing to insure a cooling of the air flowing therethrough. It is to be understood that a refrigerating medium is circulated through the coil 3 to reduce the temperature of the air in its travel through the casing and about the elements comprising the coil.

The humidifier for moistening and perfuming the air may be of any preferred construction and is preferably arranged to form a last stage for tempering air just prior to its supply to the dwelling, structure or carrier with which the apparatus is associated. The humidifier is shown as comprising a coil 5 of pipe and a supporting frame 6 and is mounted within the casing in substantially the same manner as the heating and cooling units or in any determinate way. Nozzles 7 are provided in the length of the pipe 5. A covering 8 encloses the nozzles 7 and is attached to a side of the pipe 5. The covering 8 is formed with protuberant portions having outlets in line with the respective nozzles 7. The pipe 5 is connected with a suitable source of water supply. The cover 8

is connected with a suitable source for supplying air under pressure to atomize the water discharging from the nozzles 7. A perfume or other substance may be supplied to the humidifier for impregnating the moisture supplied to the air in the process of humidifying.

Referring to Figures 1 and 7 and the detail sectional views the numeral 9 designates the casing which houses the several units. This casing is formed at one end with an inlet opening with which a pipe 10 connects. A pipe 11 connects with an outlet at the opposite end of the casing 9. A shaft 12 extends centrally through the casing and beyond the ends thereof and is mounted in suitable bearings 13. This shaft passes through the pipes 10 and 11 and has a close fit in the sides thereof. The shaft 12 is adapted to be positively rotated and for convenience an electric motor 14 is connected thereto. Fans 15 are disposed in the length of the shaft 12 and are fastened thereto for rotation therewith. These fans are designed to create a positive flow of air through the casing. As illustrated in Figures 1 and 7 a fan is located within the inlet and the outlet of the casing. Referring to Figure 1 of the drawings it will be seen that a baffle 16 is located within the casing 9 adjacent the inlet and it is spaced from the walls of the casing as shown most clearly in Figure 2 of the drawings. The baffle 16 flares outwardly and rearwardly from a central point and operates to deflect the inflowing air outwardly towards the sides of the casing which effects a spreading of the air to insure a more thorough heating or cooling and a humidifying thereof. The heater 1, cooler 3 and humidifier 5 are located at intervals in the length of the casing in the order mentioned.

In the operation of the apparatus air is drawn into the casing 9 by means of the fan at the inlet and is spread by coming in contact with the baffle 16. If the air is to be heated current is supplied to the resistance of the heater 1. On the other hand if the air is to be cooled a suitable refrigerating medium is circulated through the cooling coil 3. Should it be required to supply moisture to the air the humidifier is operated to supply vapor. Perfume or other substance may be supplied to the latter and is vaporized by the humidifier for impregnating the air simultaneously with the humidification thereof.

The air thus treated and modified is drawn from the casing 9 and passed through the discharge pipe 11 to be supplied in the manner required for use for heating, cooling, ventilating or humidifying the atmosphere of a dwelling, building or other place substantially in the manner hereinbefore indicated.

In the arrangement shown in Figure 7 a partition 17 is disposed between the heater and cooler and between the cooler and humidifier and each of these partitions is formed with a central opening in which is located a fan 15 fastened to the shaft 12 to rotate therewith. A baffle 16 is likewise disposed between the heater and cooler and between the cooler and humidifier. These baffles function in substantially the same manner as the baffles located at the inlet end of the casing. In this arrangement the air is drawn into the center of the casing, thence spread, and again drawn inwardly and forced outwardly, thus being compelled to travel in a tortuous path, which insures a thorough mixing as will be readily appreciated.

In the arrangement shown in Figure 8 of the drawings, the heating, cooling and humidifying units are separate and distinct and are connected in series. The heater 1 and cooperating baffle 16 are housed within the casing 9a. The cooler 3 and cooperating baffle 16 are located within the casing 9b. The humidifier 5 and cooperating baffle 16 are arranged within the casing 9c. Each of the casings 9a, 9b and 9c has a centrally disposed inlet and outlet in which is located a fan 15 for creating and maintaining a positive flow of air in the treatment thereof. A shaft 12a is associated with each of the casings 9a, 9b and 9c and has the fans fastened thereto and each of these shafts is adapted to be rotated from a suitable source of power in the manner found most advantageous. A pipe 18 connects the air inlets of the casings 9a and 9b and contains dampers or valves 19 to admit of controlling the flow of air through one or the other of the casings accordingly as it may be required to heat or cool the air. A pipe 20 connects the outlet of the casings 9a and 9b with the inlet of the casing 9c. A discharge pipe 11a is connected with the outlet of the casing 9c and delivers the prepared air to the place to be supplied with air as tempered or modified. A pipe 10a connects with the pipe 18 and supplies the air to be treated. This arrangement is designed chiefly for treating a large volume of air such as required to supply halls, theaters and hotels. For heating the air the same is diverted to pass through the casing 9a and is cut off from the casing 9b. If the air is to be cooled it is cut off from the casing 9a and caused to flow through the casing 9b. The direction of flow of the air is controlled by means of the dampers or valves 19 in a manner readily appreciated.

Having thus described the invention, I claim:

Air treating apparatus comprising a casing, having an air inlet and an air outlet at opposite ends, partitions within the casing dividing the interior thereof into a plurality of compartments and having central

openings, a shaft passing through the casing, fans rotatable with the shaft and associated with the inlet and outlet of the casing and the openings of the partitions, a flared
5 baffle adjacent the inlet to spread the air in all directions toward the wall of the casing, similar baffles adjacent the several partitions, and an air treating unit in each of said compartments.

10 In testimony whereof I affix my signature.
ARTHUR DRISCOLL. [L. s.]

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