

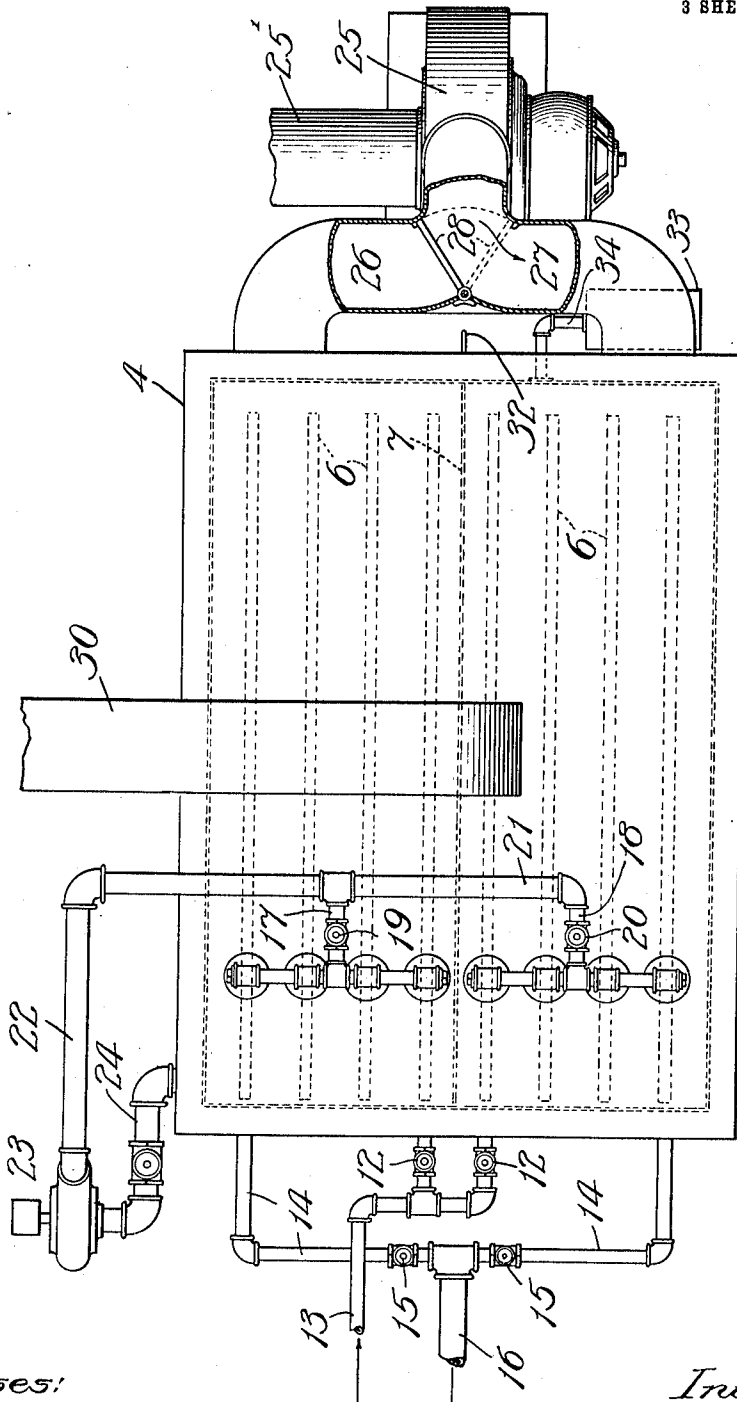
F. WITTENMEIER.
AIR COOLING APPARATUS.
APPLICATION FILED OCT. 26, 1910.

988,613.

Patented Apr. 4, 1911

3 SHEETS—SHEET 1.

Fig. 1.

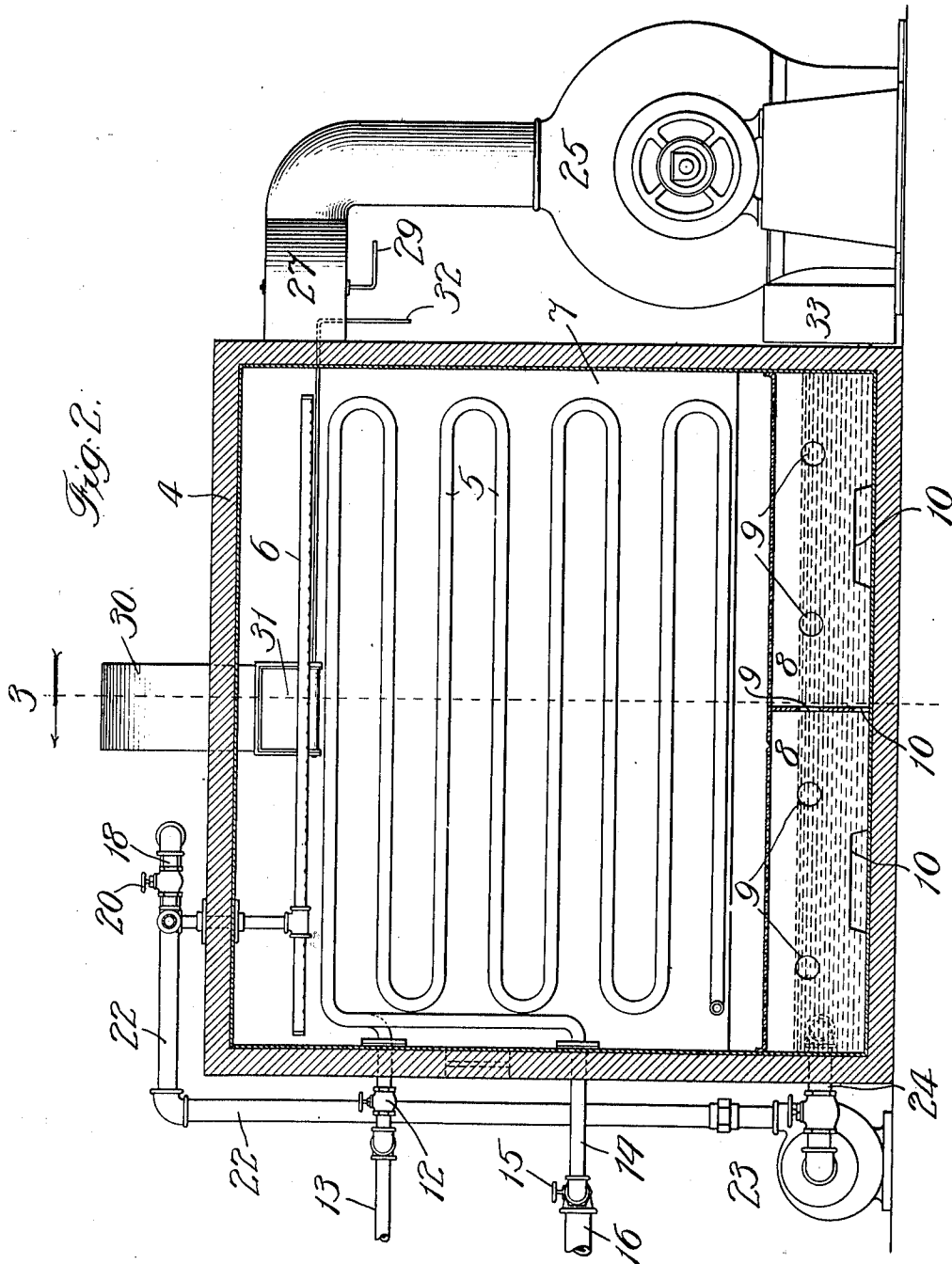


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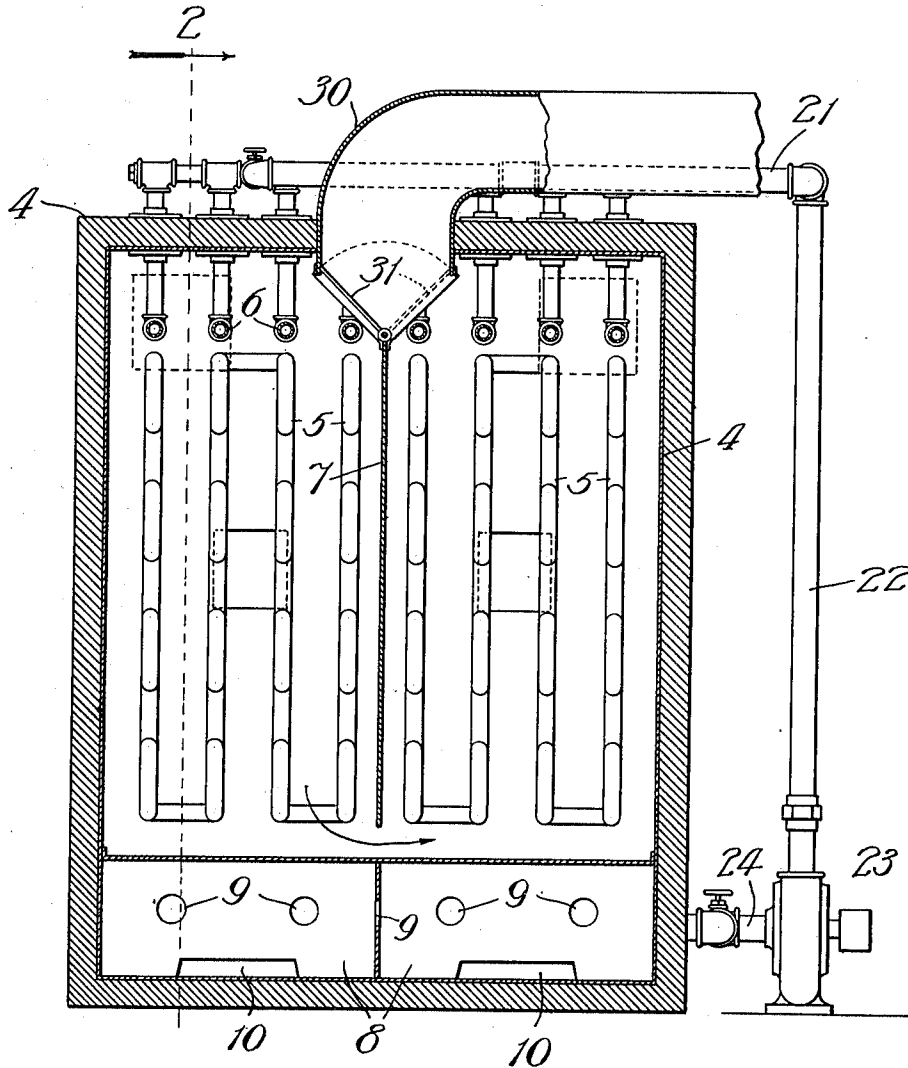
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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AIR-COOLING APPARATUS.

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To all whom it may concern:

Be it known that I, FREDERICK WITTENMEIER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Air-Cooling Apparatus, of which the following is a specification.

My invention relates to an improvement in the class of apparatus used in theaters, hotels, restaurants, and other public buildings, as also in private buildings, for washing and cooling air forced into the apartments, and drying the air to a desired condition of humidity.

In the accompanying drawings, Figure 1 is a broken plan view of my improved apparatus, partly in dotted representation, with the valved pipes for supplying and withdrawing the water and gaseous refrigerating medium shown diagrammatically; Fig. 2 is a view of the apparatus in cross-sectional elevation, partly broken, the section being taken on line 2, Fig. 3; and Fig. 3 is a broken section on line 3, Fig. 2.

A box 4, shown of rectangular form houses refrigerating-coils 5 and water-spraying pipes 6. The box is divided into two compartments by a central vertical partition 7 extending from the top of the box short of the base thereof. In the base is a water-pan 8, preferably provided in four similar sections in open communication with each other through ports 9 and 10 in the partitions dividing them. The two compartments are in open communication with each other below the partition 7.

The gaseous refrigerating medium (preferably carbonic acid) is supplied in the usual manner, continuously to the coils through a pipe 13 containing similar regulating valves 12, 12 for admitting to either coil, according to requirement, more or less of the refrigerating medium, which is exhausted from both coils, by way of the pipes 14, past the normally-open valves 15, 15 therein, through the discharge pipe 16. The two sets of perforated pipes 6 are adapted to be supplied, each independently of the other set, or alternately, with water through pipes 17 and 18, respectively, containing the shut-off valves 19 and 20 and branching from a header 21 which leads from the discharge-pipe 22 of a pump 23, the suction-side of which communicates with the pan 8 through a valved

pipe 24. Thus, with either valve 19 or 20 closed and the other open, water from the pan may be forced by the pump into the pipes 6 of one compartment.

An air-blower 25, of ordinary or any suitable construction, has its supply-pipe 25' in communication with the apartment (not shown) to be cooled and has its discharge-outlet connected by branch-conduits 26 and 27, respectively, with the two compartments in the box 4 at one side thereof near its upper end. Between these two branches is hinged a flap-valve 28 for closing either compartment to the blower and thereby opening the other thereto, a handle 29 being shown to be provided for turning the valve. A discharge-conduit 30, for cooled air, extends through the top of the box, from within the same near the center of the top, to said apartment to be cooled, and registers at its receiving-end with the adjacent edge of the partition 7, to which is hinged a flap-valve 31, provided with a handle 32 by which to turn it for opening either compartment and thereby closing the other to the conduit 30.

Water is fed to the pan 8, to replenish it, from an external tank 33 through a pipe 34.

With the flap-valves 28 and 31 occupying the positions of their full-line representation, the blower and pump in operation, and the valve 20 open (the valve 19 being closed), while the refrigerating agent is passing through the coils in both compartments, water is sprayed into the compartment controlled by the valve 20 and air is forced by the blower downwardly through that compartment to be washed by the water which falls into the pan. The water prevents frost or ice forming on the pipes of the coil in that compartment, but such frost or ice forms on the pipes of the coil in the other compartment, into the bottom of which the humid air passes underneath the partition 7 to rise therein in contact with the cold pipes, which cool it and congeal out of it more or less of its contained moisture; and the resultantly dried and cooled air passes out of the last compartment through the conduit 30 into the apartment to be cooled by it. The described operation is continued for a period, say 24 hours, insufficiently long to permit the frosted coil to become clogged by the accumulation of ice in the spaces between the pipes. By then opening the valve 19 and closing the valve 20 and turning the flap-

valves to the positions of their dotted-line representation, the operation is reversed, spraying the water into the compartment containing the ice-coated coil and thereby
 5 melting off the ice while the coil in the other compartment becomes coated with ice to dry and cool the air then initially introduced into the first-named compartment.

As will thus be seen, the operation of this
 10 apparatus is rendered continuous and may be carried on indefinitely, merely requiring the periodical setting of the valves for directing the water and air courses.

What I claim as new and desire to secure
 15 by Letters Patent is:

1. In an air-cooling and humidifying apparatus for the purpose set forth, the combination of a box divided into compartments intercommunicating near their bases, refrigerating-coils in the compartments, water-spraying pipes in the compartments, a
 20 water-receptacle in the lower part of the box, a pump communicating at its suction-side with said receptacle, a pipe extending from the discharge-side of the pump and having valved branches discharging to the different compartments for directing water thereto alternately, an air-blower having
 25 valved communication with each compartment for directing air thereto alternately, and an air-discharge conduit leading from the box, having valve-controlled communication with the compartments for directing the air-discharge therefrom alternately.

2. In an air-cooling and humidifying apparatus for the purpose set forth, the combination of a box, a vertical partition dividing the box into compartments intercommunicating under the partition, a water-pan
 35 in the bottom of the box, a refrigerating-coil

in each compartment with valved supply and exhaust-pipes for a gaseous refrigerating agent, water-spraying pipes in the compartments, a header having valved branches each
 45 discharging to the pipes in a different compartment, a pump communicating at its suction-side with said pan and having a discharge-pipe leading to the header, an air-blower having valved communication with each compartment for directing air thereto
 50 alternately, and an air-discharge conduit leading from the box, having valve-controlled communication with the compartments for directing the air-discharge therefrom alternately.

3. In an air-cooling and humidifying apparatus for the purpose set forth, the combination of a box divided into compartments intercommunicating near their bases, refrigerating-coils in the compartments, water-spraying pipes in the compartments, a water-receptacle in the lower part of the box, a
 60 pump communicating at its suction-side with said receptacle, a pipe extending from the discharge-side of the pump and having valved branches discharging to the different compartments for directing water thereto
 65 alternately, an air-blower having discharging conduit-branches leading each to a different compartment, a flap-valve operating between said branches, a conduit leading from both compartments in the box, and a flap-valve in the box for closing and opening the compartments alternately to said conduit.

FREDERICK WITTENMEIER.

In presence of—

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 R. A. SCHAEFER.