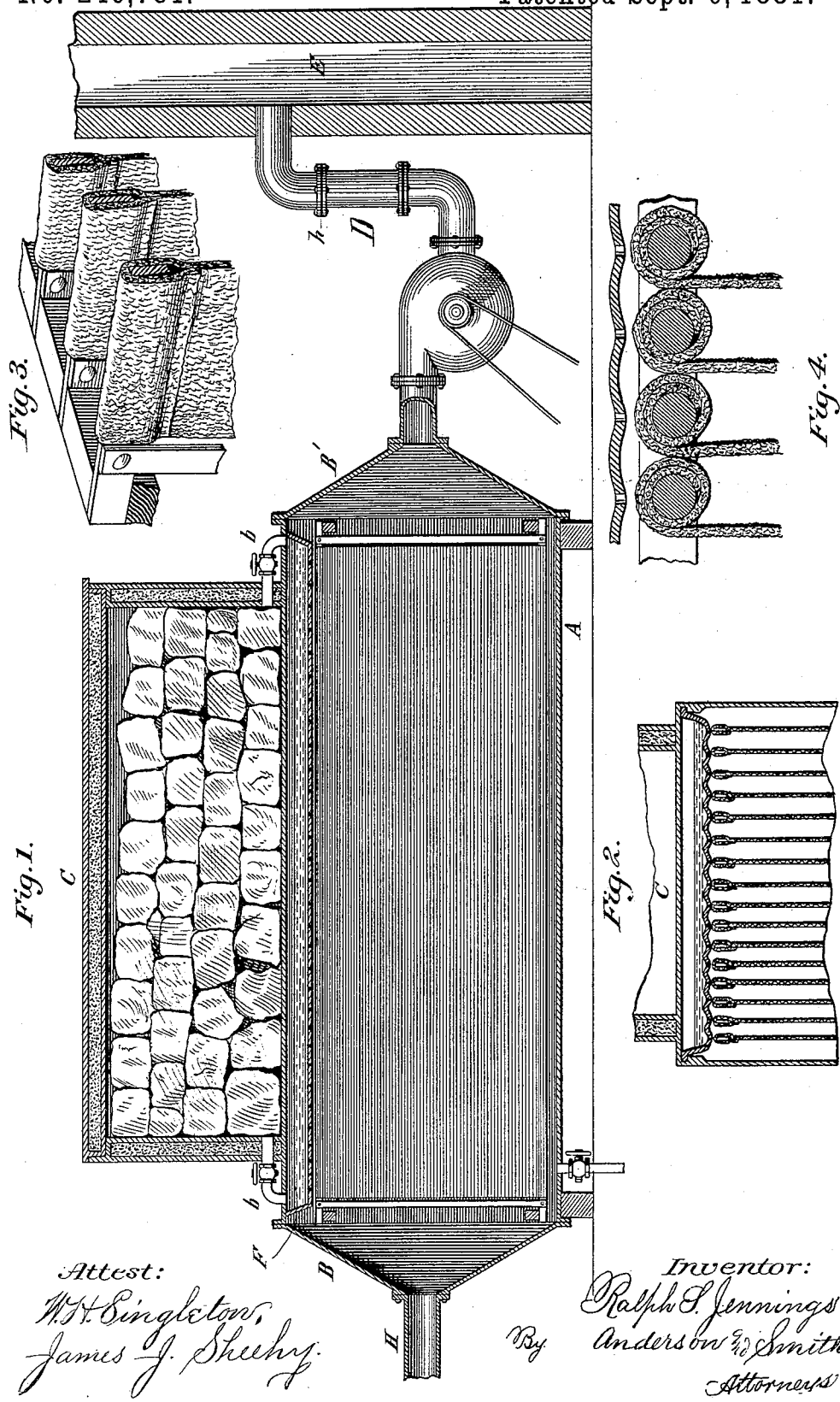
(No Model.)

R. S. JENNINGS.

AIR COOLING APPARATUS.

No. 246,781. Patented Sept. 6, 1881.



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UNITED STATES PATENT OFFICE.

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AIR-COOLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 246,781, dated September 6, 1881.

Application filed August 2, 1881. (No model.)

To all whom it may concern:

Be it known that I, RALPH S. JENNINGS, a citizen of the United States, a resident of Baltimore, in the county of Baltimore and State of Maryland, have invented a new and valuable Improvement in Air-Cooling Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

The object of this invention is to provide an apparatus for regulating and controlling the temperature of buildings, hospitals, sick-chambers, rooms, apartments, vessels, &c., and at the same time furnish dry and pure air; and to this end my invention consists in the method of passing air between a series of longitudinal and parallel screens composed of rough fibrous material, between which the air is passed uninterruptedly, and becomes cooled, dried, and purified from contact with the dampened screens.

My invention further consists in a cooling-chamber provided with a series of longitudinal vertical screens composed of a rough fibrous material, preferably terry fabric, so that the current of air to be cooled can readily pass between the said screens and become cool and dry on the way to the chamber or apartment.

My invention further consists, in combination with a cooling-chamber provided with a series of longitudinal vertical screens composed of a fibrous material, of an ice chamber or box arranged above the cooling-chamber and having communication therewith, for conducting the cold water or ice-drippings from the said ice-box onto the fibrous screens.

My invention further consists in the combination of a cooling-chamber provided with a series of longitudinal vertical screens composed of a fibrous material, an ice chamber or box arranged above the cooling-chamber, and a tray or pan having a series of perforated troughs to register over the fibrous screens, and a communication for conducting the cool water or drippings from the ice-box into the pan.

My invention further consists in an air-cooling apparatus consisting, essentially, of a cooling-chamber having a series of longitudinal vertical screens composed of a fibrous material, an ice-box arranged above the cooling-chamber and communicating therewith to conduct the cool water or drippings into a suspended, corrugated, and perforated pan arranged above the screens, a suction-fan, and pipe-connections for receiving the air to be cooled and conducting the same to the desired apartment.

My invention further consists in the novel construction and combination of the parts, as will be hereinafter more fully set forth and specifically claimed.

Figure 1 of the drawings is a central longitudinal section of my improved air-cooling apparatus, showing the connection with a flue of a building. Fig. 2 is a transverse sectional view, showing a portion of the ice-box, drip-pan, and a portion of the air-cooling chamber. Fig. 3 is a perspective view of a portion of the screen-supporting frame, and Fig. 4 is a modification of the device shown in Fig. 3.

The letter A represents the air-cooling chamber, preferably rectangular in shape, but of any desired dimensions. This cooling-chamber is constructed with two conical heads, B B′, to which the air induction and eduction pipes are attached, substantially as seen in Fig. 1 of the drawings. These heads are secured to the ends of the chamber in any suitable manner—preferably by bolts.

Within the cooling-chamber A is arranged transverse frames, having slots into which rest, at the top and bottom, the ends of the bars or strips to which the fabric is attached. The cooling-chamber A is also provided near the top with longitudinal strips, upon which the pan or tray rests.

The fabric forming the longitudinal vertical partitions within the cooling-chamber is composed, preferably, of terry fabric, commonly designated as "Turkish toweling," so as to secure a rough surface with a large amount of absorbing and cooling surface; but it is obvious that other textile fabrics may be employed for this purpose.

The advantage of arranging the fibrous screens longitudinally are obvious, in view of the fact that if the screens were arranged transversely in the cooling-chamber and the air

forced or drawn through the same the moisture, instead of being retained by the screens, would be forced or drawn out of the same and carried into the apartment, thereby rendering the air objectionable on account of the large amount of moisture contained in it. I have also found in my experiments that the rough surface of the terry fabric or Turkish toweling will take up most of the moisture by absorption and carry it rapidly by gravitation to the bottom of the screens, where it will collect.

The letter C represents an ice box or chest arranged above the cooling-chamber to receive the ice or cold water, or both. Immediately below this ice-box and above the fibrous parallel screens is supported a pan by means of longitudinal strips or cleats. This pan is provided with a series of longitudinal troughs, *a*, perforated at certain intervals immediately, or nearly so, over the longitudinal vertical fibrous screens, for the purpose to be hereinafter described. Communication is established between the ice-box and the water-pan by means of the pipes *b*, which are provided with suitable cocks or valves.

To the forward head, B′, of the cooling-chamber are attached the pipe-sections D, leading into the flue E, establishing a communication with the desired apartments of a building. To these pipe-sections, at a suitable point, is attached a suction-fan in any of the well-known manners, and the shaft of this fan is provided with the usual drive-pulley, which is provided with a belt from the driving-shaft of the motor.

The joints between the pipe-sections are provided with packing for the purpose of deadening the noise and preventing rattling of the adjacent parts. This noise and rattling of the pipes may be obviated by the introduction of a section composed of flexible tubing.

To the head B of the cooling-chamber A is attached a pipe leading to the exterior of the building or other source to receive the supply of fresh air.

The operation of this apparatus is as follows: The broken ice, mixed with salt, and in some cases with water added, is placed in the box C, with non-conducting walls and top, or it may be properly protected by means of blankets and a non-conducting top. Then the cocks or valves are opened, so as to allow the water or drippings from the ice-box to pass into the pan F, so as to cover the surface or lodge in the troughs and percolate or drip through the perforations upon the longitudinal vertical fibrous screens, which, in return, become thoroughly saturated from the drippings. Power is applied and the suction-fan put in motion, which draws the air through the induction-pipe H into the cooling-chamber, where it disperses, on account of the bulging or conical head B of the cooling-chamber, and passes forwardly in divided currents between the longitudinal parallel rows of the terry fabric or Turkish toweling. By coming in contact with said cool surfaces the heat is withdrawn from the currents of air, and as the currents of air advance forward through the cooling-chamber they become purified, dried, and of a refreshing nature. As the air becomes cool and purified by its progress through the cooling-chamber it is finally drawn into the pipe D and forced through the flue E into the desired apartment.

Attention is called to the fact, as found in my experiments in my lard-refinery, in Baltimore, Maryland, the results of which were fully sustained by the use of the hereinbefore-described apparatus at the Executive Mansion, Washington, District of Columbia, that when the temperature in the cooling-chamber is lowered by the contact of the air with the rough cloths, which are moistened with ice-water, the air deposits the moisture which it contains upon the screens or cloths as dew; or, if the temperature in the cooling-chamber is reduced very low, the moisture will take the form of frost and be deposited upon the screens. Thus, by the employment more especially of the longitudinal parallel screens, as described, a cooled atmosphere is provided, which is purified by refrigeration and contact, and which is delivered free from moisture.

I do not wish to confine myself to the exact construction herein shown and described, as it is evident that changes may be made without departing from the spirit of my invention. For instance, instead of the corrugated and perforated pan, I may use a perforated serpentine pipe; or the air-supply, instead of being admitted to the end of the cooling-chamber, may be made to enter at the top of the ice-box and through the same.

What I claim as new, and desire to secure by Letters Patent, is—

1. The method of cooling, purifying, and drying air which consists in passing the air between longitudinal parallel screens of fibrous material which have been previously moistened with a cooling-liquid, substantially as described.

2. A cooling chamber or chest provided with screens of fibrous material which are arranged longitudinally and vertically within the same, for the purpose set forth.

3. An air cooling chamber or chest provided with parallel screens of fibrous material arranged longitudinally and vertically within the chamber, in combination with a tank or box for a cooling medium and connecting means, substantially as described, and for the purpose set forth.

4. The combination of a cooling chamber or chest provided with parallel screens of fibrous material arranged longitudinally and vertically within the chamber, an ice-box arranged above the cooling-chamber, and a perforated pan, with means for connecting with the ice-box, arranged substantially as described, and for the purpose set forth.

5. The combination of an air-cooling chamber or chest having a series of parallel screens of fibrous material arranged longitudinally and

vertically within the said chamber, an ice-box arranged on top of the cooling-chamber, a perforated troughed pan, with means of establishing communication with the ice-box, the air induction and eduction pipes, and a suction or force fan, substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

RALPH S. JENNINGS.

Witnesses:
W. H. SINGLETON,
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