

No. 664,776.

Patented Dec. 25, 1900.

E. F. PORTER.

APPARATUS FOR COOLING AND AGITATING AIR.

(Application filed Dec. 20, 1897.)

(No Model.)

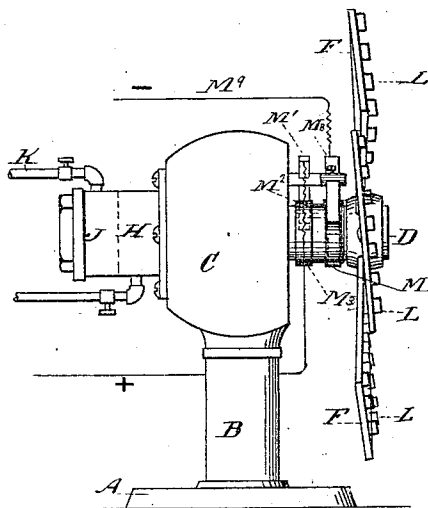


Fig. 1.

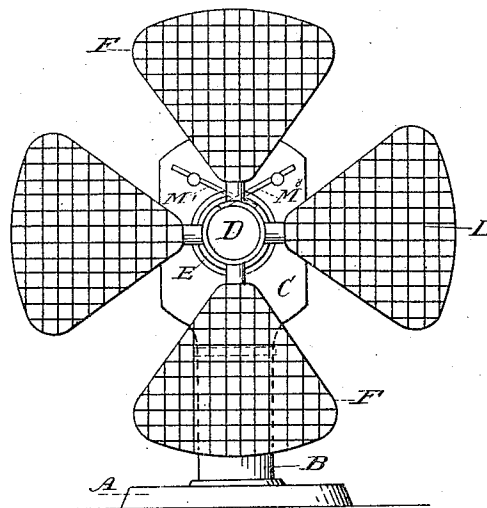


Fig. 2.

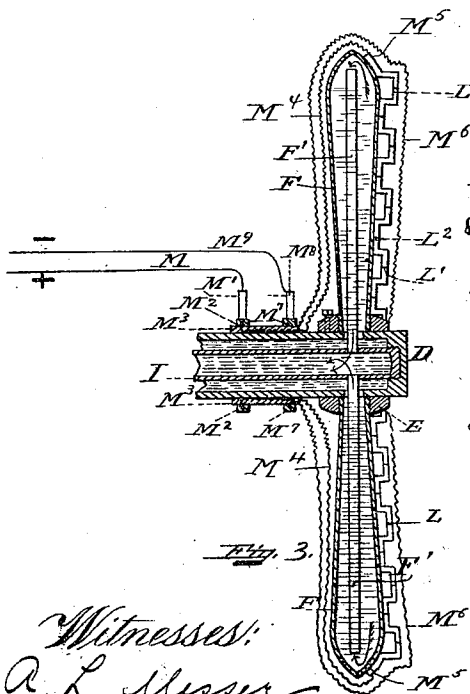


Fig. 3.

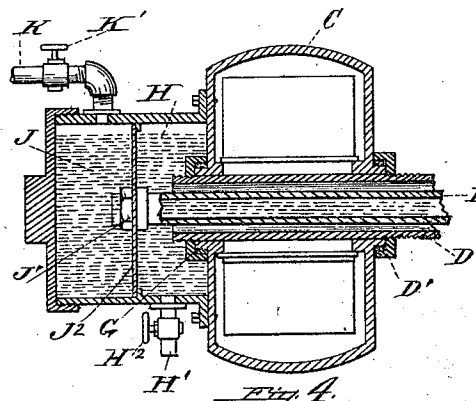


Fig. 4.

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UNITED STATES PATENT OFFICE.

EDWIN F. PORTER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE BAY STATE ELECTRIC HEAT AND LIGHT COMPANY, OF JERSEY CITY, NEW JERSEY.

APPARATUS FOR COOLING AND AGITATING AIR.

SPECIFICATION forming part of Letters Patent No. 664,776, dated December 25, 1900.

Application filed December 20, 1897. Serial No. 662,541. (No model.)

To all whom it may concern:

Be it known that I, EDWIN F. PORTER, a subject of the Queen of Great Britain, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Cooling and Agitating Air, of which the following is a specification.

My invention relates to an apparatus for cooling and agitating air; and the object is to cool the air by the action of an electric current in a thermopile, the action of said current displacing heat from one end of the electric conductors to the other, thereby cooling the air in contact with the end from which the heat has been taken, after which the heat which is stored at the opposite end is carried away by a current of water. The air after being cooled is blown from the cooling-surfaces by the revolution of fan-blades in which the cooling-surfaces are incorporated, and in this way the temperature of the apartment in which the fan is placed is lowered.

My invention consists of certain novel features hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate a construction embodying my invention, Figures 1 and 2 represent, respectively, side and front views of an apparatus for cooling and agitating air. Fig. 3 is a sectional view through two opposite fan-blades and the motor-shaft. Fig. 4 is a sectional view of the circulation-chamber and motor.

Like letters of reference refer to like parts throughout the several views.

A represents a base, upon which rests a post B, and upon said post is supported a motor C. On the front end of the motor-shaft D there is secured a hub E, in which are secured four hollow blades F, which communicate with the interior of the shaft D, as shown in Fig. 3, and the inner end of said shaft D communicates through the stuffing-box G with a water-chamber H, which receives its supply through the pipe H', having a suitable controlling-valve H². The water entering the chamber H passes through the hollow shaft D and enters the blades F and passes from said hollow blades

through the inner tubes F' to the interior of the inner hollow shaft I, which passes rearwardly through the stuffing-box J' and communicates with the water-chamber J on one side of the partition J², which separates the water-receiving chamber H and the water-outlet chamber J. The water entering the chamber J passes off through the pipe K, having a suitable valve K', effecting in its circulation the cooling of the inner side of the thermopile L, hereinafter described.

Mounted on the front of each blade of the fan is a thermopile L of the ordinary construction and securely fastened to the front side of each blade, and a wire conductor M supplies the current to the brush M', which current passes to the collector-ring M², mounted on the insulating-drum M³. The current passes through the wire M' in the insulating drum M³, and the wire is connected with one pole of the thermopile L at M². The current passes through the thermopile and out through the wire M⁶ back to the other collector-ring M' and thence to the brush M⁸ and to the wire M⁹, which completes the circuit. The inner shaft I being secured fast at its front end to the outer shaft D revolves with said shaft as said shaft D is revolved by the electric motor C, which may be of the ordinary construction, and in the revolution of the outer shaft D the brushes M' and M⁸ are kept in constant contact with the collector-rings N² and N⁷, and thereby supply the thermopile of each fan-blade with an electric current.

In this device the object is to cool the air in an apartment by means of an electric current, and this cooling is effected by passing a current through a thermopile of the ordinary construction. The current in passing will remove the heat from the outer joints L' of the thermopile to the inner joints L², and the heat which has been thus displaced by the current is then carried away by a current of water, which circulates against the inner surfaces of the hollow blades with which the inner joints of the thermopile are in contact. The thermopile is soldered on each blade and is therefore an integral part thereof and forms

the cooling-surfaces which come in contact with the air, and it is obvious that the fan in revolving will cool the air of the apartment in which it is located, and the cooled air will be rapidly diffused or carried away from each blade upon the operation of the fan.

It is obvious that the entire fan-blade may be formed of the thermopile so arranged that the water will come in direct contact with the inner joints of the thermopile, to which the heat has been carried by the action of the electric current.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

Having thus ascertained the nature of my invention and set forth a construction embodying the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus of the character specified, a rotatable fan provided with a hollow blade, means for circulating a fluid through said hollow blade, a thermopile contacting with the face of said blade, and means for supplying electricity to said thermopile.

2. In an apparatus of the character specified, a fluid-supply chamber, a fluid-receiving chamber, a hollow shaft, means for rotating said shaft, a fan carried by said shaft having a hollow blade, passage-ways connecting said chambers through said hollow shaft with said hollow blade to circulate a fluid through said blade, a thermopile contacting

with the face of said hollow blade, and means for supplying electricity to said thermopile.

3. In an apparatus of the character specified, a rotatable shaft, a fan carried by said shaft having a hollow blade, means for circulating a fluid through said blade, a thermopile contacting with the face of said hollow blade, collectors carried by said shaft, brushes electrically connected with a source of electricity engaging with said collectors, electrical connections between said collectors and said thermopile, and means for rotating said shaft.

4. In an apparatus of the character specified, a fluid-supply chamber, a fluid-receiving chamber, a hollow shaft, means for rotating said shaft, a fan carried by said shaft having a hollow blade, passage-ways connecting said chambers through said hollow shaft with said hollow blade to circulate a fluid through said blade, a thermopile contacting with the face of said hollow blade, collectors carried by said shaft, brushes electrically connected with a source of electricity engaging with said collectors, and electrical connections between said collectors and said thermopile.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 18th day of December, A. D. 1897.

EDWIN F. PORTER.

Witnesses:

A. L. MESSER,
E. L. HARLOW.