W. A. LIGHTHALL.

Steam Heater.

No. 96,709. Patented Nov. 9, 1869.

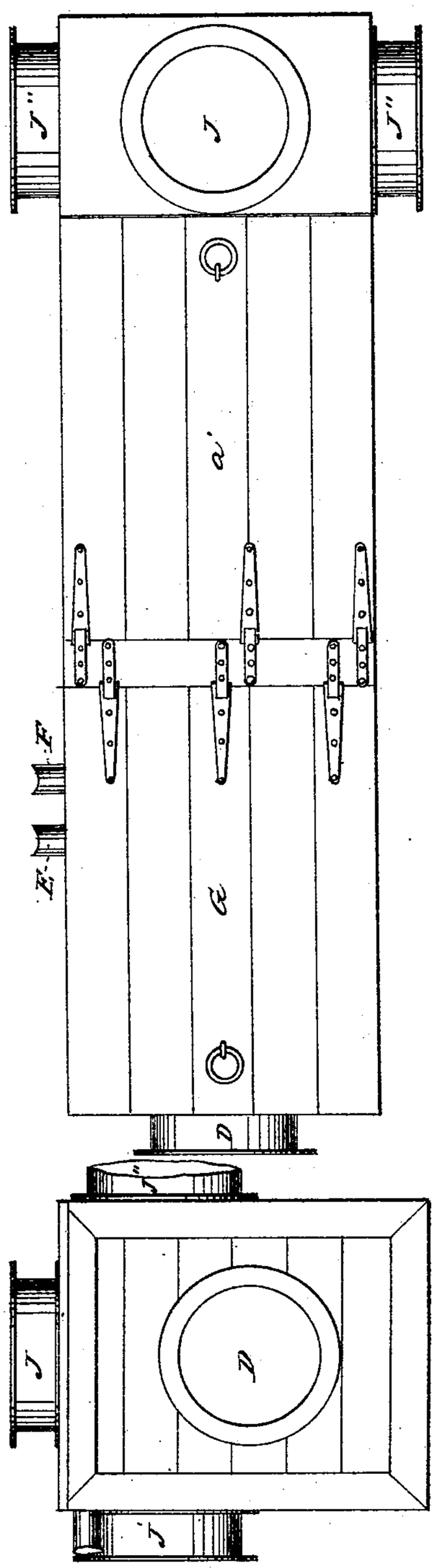

FIG. 2

FIG. 1

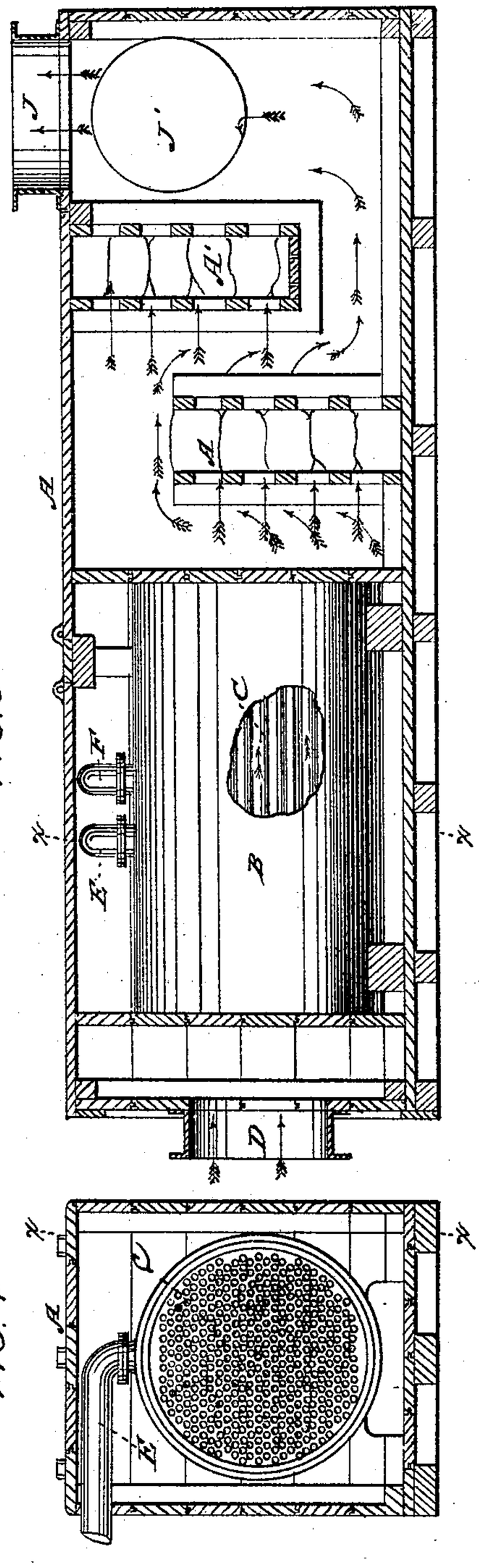

FIG. 3

FIG. 4

WITNESSES:
Francis L. Low
Addison Low

INVENTOR.
Wm A Lighthall

United States Patent Office.

WILLIAM A. LIGHTHALL, OF NEW YORK, N. Y.

Letters Patent No. 96,709, *dated November* 9, 1869.

APPARATUS FOR WARMING AND COOLING APARTMENTS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM A. LIGHTHALL, of the city, county, and State of New York, have invented a certain new and useful Combination of a Heater, for Heating Rooms, and a Refrigerator, for Cooling Rooms, both being contained in one apparatus; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 is an end elevation.

Figure 2 is a plan view.

Figure 3 is a longitudinal-cut section, taken through the line *x x*, fig. 4.

Figure 4 is a transverse section, taken through the line *x x*, fig. 3.

The object and purpose of my invention are to combine, within one apparatus, the means by which rooms can be heated in cold weather, and cooled in warm weather, to avoid the expense and trouble of two distinct apparatus to effect these purposes, as now required.

A is the case of the apparatus, which may be made of wood or of light metal, as may be desired. In this case, the whole of the means for heating and cooling are placed and located, excepting the mechanical means to furnish and supply the air to be heated or cooled, as hereinafter described.

B is a cylinder, of proper length to effect its purpose, and of such diameter as to contain the requisite number of valves, which is made of such thickness of metal as to withstand the pressure of the steam exhausted into the same, when the apparatus is used as a heater. Into this cylinder, there can also be a pipe from the boiler, that will furnish "live" steam, to further increase the heating-power of the apparatus.

C are the tubes in the cylinder B, of such number and length as may be required for the purposes of heating, when the apparatus is used for heating-purposes. These tubes are secured properly in the heads of the cylinder, so as to allow of the expansion and contraction of the same, if desired, or found necessary in practice.

D is the nozzle, through which air is taken into the cylinder B, to pass through the tubes C, to effect either of the objects of heating or refrigerating. The air to be supplied through this nozzle, to effect the purposes named, can be furnished by a fan-blower, or other equivalent means, operated by a steam-engine, to be attached to the steam-boiler that, directly (by live steam) and indirectly (by exhaust steam from the engine,) heats the air, when the apparatus is used for a heater. When the apparatus is used for a refrigerator, of course no steam is allowed to enter the cylinder B, proper provision being made to allow all the steam, both live and exhausted, to escape in other directions.

E is the steam-pipe leading from the boiler to the heater, with which is connected, by proper means, the exhaust from the engine before named. These pipes may be reversed, as found convenient, so that the larger pipe shall be the exhaust, and the smaller one, attached, the pipe for the live steam.

F is the exhaust-pipe from the heater B, through which the exhaust steam that is not condensed in the heater B can be taken off to any desired locality. The resultant products of the steam exhausted or supplied to the heater B are to be taken away from the bottom of the case of the heater by any known means, not confining myself to any particular way of doing the same.

F is the exhaust-pipe from the cylinder B, by which the exhaust steam is taken away, after the steam entering and fulfilling its object, as before stated, the amount of the same being very limited; and, if the apparatus is in complete order, there should be none. It is requisite, however, to provide for any contingency of this nature, and this pipe will effect the purpose of allowing the same to escape, if needed, or to take off the incondensable vapor that would not be carried, by means provided, as above named, for taking off the water of condensation.

G G′ are covers to the case A, which are properly provided with hinges, or other means, to allow the interior of the case and its attachments to be reached, to make the said interior effective for the purposes designed.

H H′ are compartments, which are filled with ice, in blocks or pieces, when the apparatus is to be used for a refrigerator. They are slotted on the sides, so that the current of air through the tubes can go through and around the ice contained in them, carrying the air thus cooled through, around, and by these compartments, to be taken away to the places or apartments where it is required through the apertures J J′ J″. By this means, the temperature of a room or rooms can be kept as low in the hottest weather as may be desired, the degree of the same being very nearly regulated by the speed of the air passed through the tubes C.

J J′ J″ are apertures, through which either the heated or the cooled air is taken to the several rooms required to be heated in winter, or cooled in summer. Of course, the outlets to the pipes connected to these apertures (in the ordinary manner) will be provided with "registers" or valves, or other means by which the current of hot or cold air can be controlled at will.

When the apparatus is used as a heater, the ice in the compartments named is left out, and it then acts simply as a heater, the hot air passing through the in-

terstices in the compartments H H', to be passed through to the apertures J J' J", and from thence to the room to be heated, the same as described for the passage of cold air.

I am aware that different styles of apparatus have been constructed and used for the purpose of heating rooms by heated air, and also that different styles of apparatus have been constructed and used for the purpose of cooling rooms, but in every case these have been separate and distinct from each other, each being required to be operated by itself, by a distinct and separate mechanical movement.

I, therefore, do not claim, broadly, the heating or cooling of rooms "*per se;*" but

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

The combined heater and refrigerator for heating or cooling rooms, constructed, operated, and applied as and for the purposes herein set forth.

WM. A. LIGHTHALL.

Witnesses:

FRANCIS S. LOW,

ADDISON LOW.