

(No Model.)

W. A. CHASE.
REFRIGERATING APPARATUS.

No. 299,622.

Patented June 3, 1884.

Fig. 1.

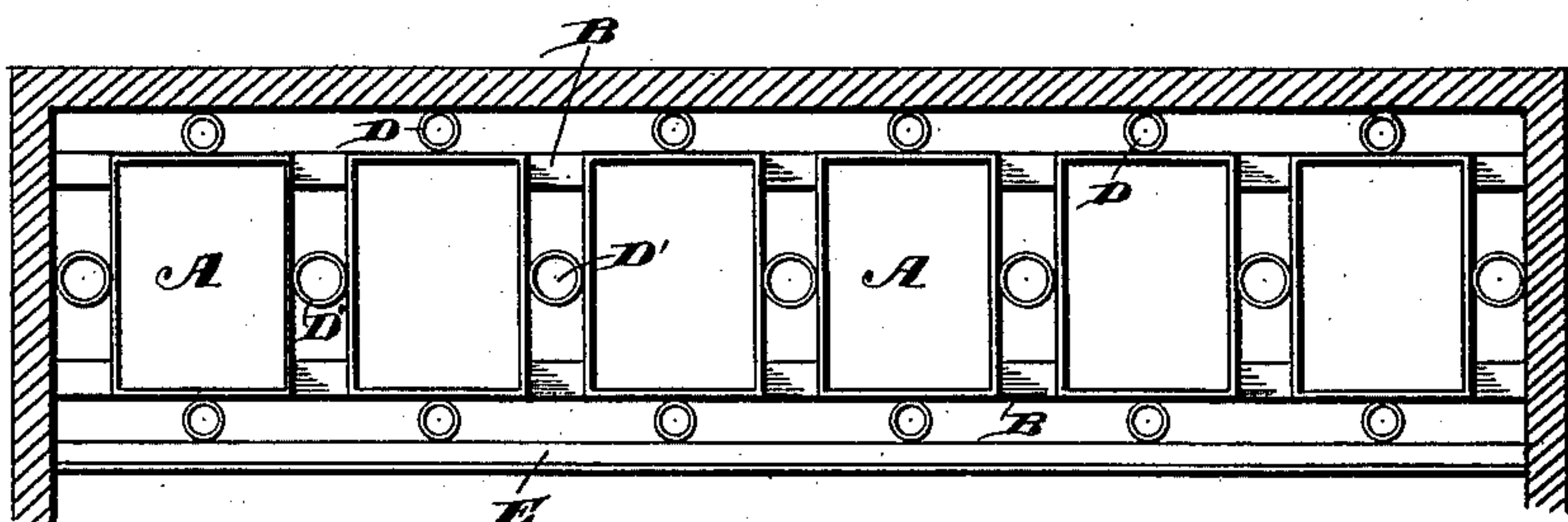


Fig. 2.

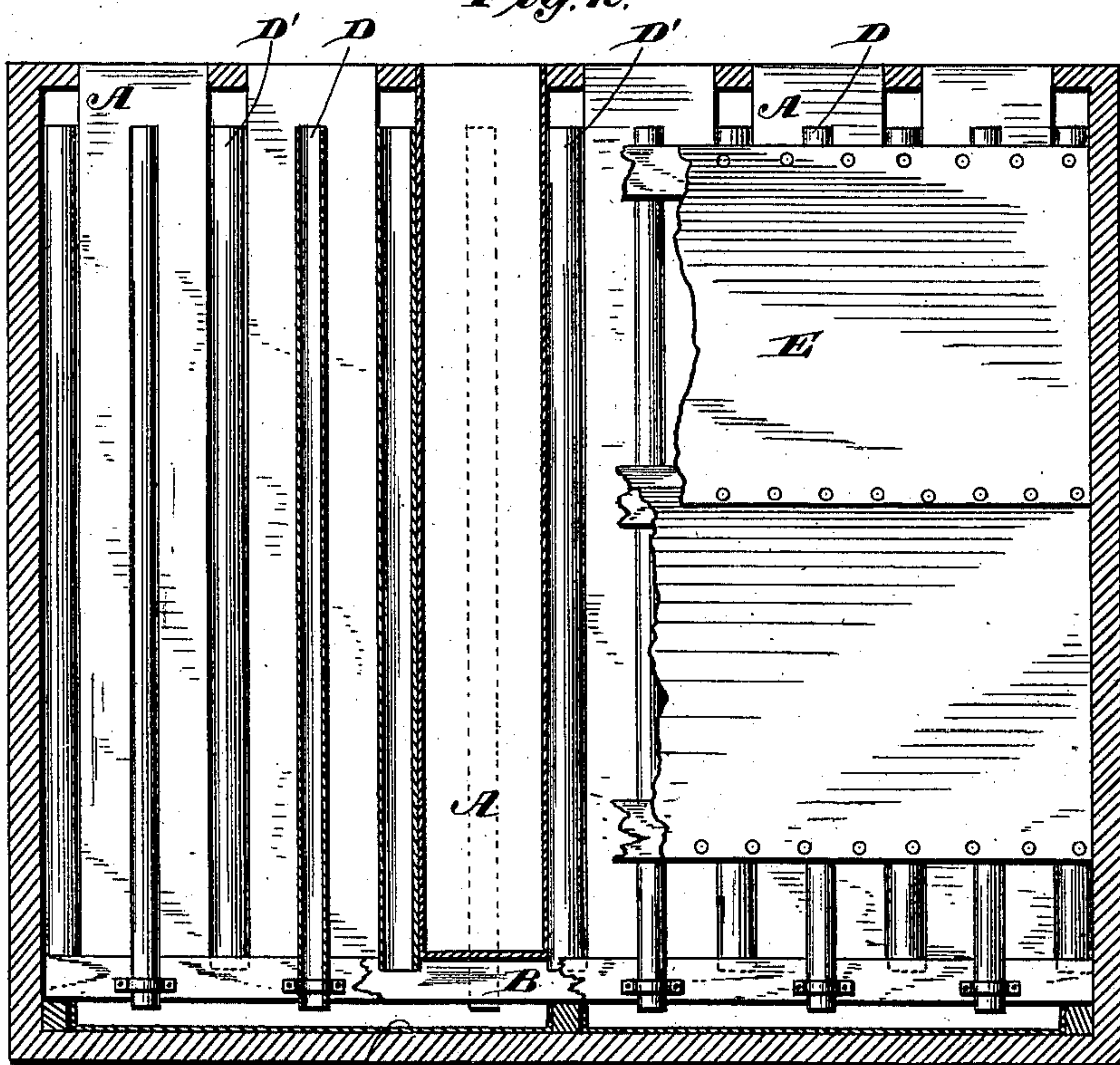
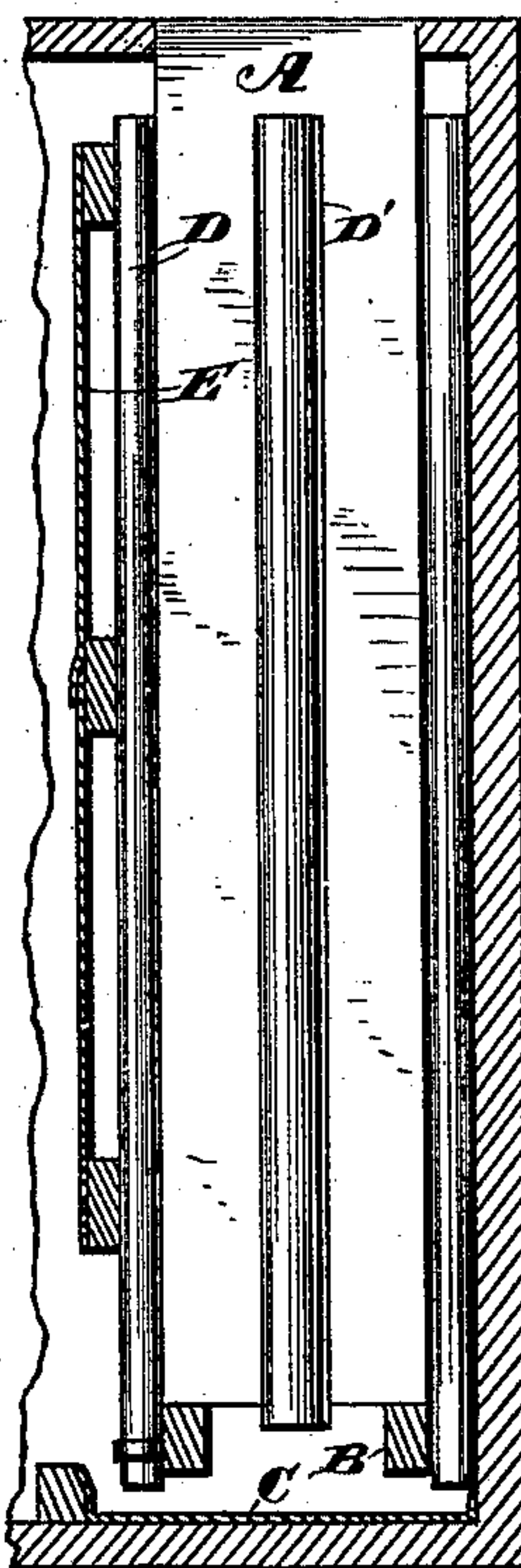


Fig. 3.



Witnesses,

Robert Everett,

J. A. Rutherford

Inventor,

Warren A. Chase,

By

James L. Norris,

Atty.

UNITED STATES PATENT OFFICE.

WARREN A. CHASE, OF BOSTON, MASSACHUSETTS.

REFRIGERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 299,622, dated June 3, 1884.

Application filed August 17, 1883. (No model.)

To all whom it may concern:

Be it known that I, WARREN A. CHASE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Refrigerating Apparatus, of which the following is a specification.

My invention relates to refrigerating apparatus of the kind used in refrigerator-cars, on vessels, and in large refrigerating establishments; and the purpose of said invention is to secure a low and uniform temperature within the preserving compartment, to secure an automatic circulation and diffusion of the air contained therein, and to provide a surface or surfaces for the condensation of the moisture.

To this end, therefore, my invention consists in a series of tanks having open pipes arranged vertically in contact with their sides, said pipes being of metal which is a good conductor of heat, whereby constantly descending air-currents are created and an increased condensing-surface obtained, while at the same time the said pipes serve to brace the tanks and occupy the space usually filled by joists.

Referring to the drawings forming part of this application, Figure 1 is a plan view. Fig. 2 is a front elevation. Fig. 3 is an end elevation.

A in said drawings represents a series of tanks arranged in a refrigerating car or compartment. These tanks may be of any suitable form and size, and are of metal, it being intended to fill them with a freezing-mixture. They are placed in the usual manner upon a support, B, raised somewhat above the floor, to permit a free circulation of air, and a drip-pan, C, is arranged beneath, to receive the condensed and uncongealed moisture which falls from the surface of the tank.

Upon each side of every tank I place upright tubes D, which may be fastened in place in a variety of ways. Each tube is open at both ends, and is placed in contact with the tank, serving to brace and support the latter and taking the place of joists, which would otherwise be necessary. It will readily be seen that as the warmer portions of the air at the top of the compartment come in contact

with the pipes, they will be cooled and deprived of a considerable portion of their moisture, and, their specific gravity being changed by the change of temperature, the air will descend, creating continuous currents downward. In this manner the temperature is not only rendered equable throughout the car, but the air is dried, and, as the moisture condensed therefrom upon the surfaces of the tubes and cooling-tanks is immediately congealed, the whole forms an ice-plant, by which the refrigeration is aided. An air-dividing partition, E, is placed in front of the tanks, and this partition may be composed of metal plates, as shown in Fig. 2, whereby a largely-increased condensing-surface is obtained. When a series of tanks are arranged as shown in Fig. 1, the intermediate pipes, D, are made of such size as to lie against the adjacent walls, affording the required support and a proportionately-increased condensing-surface.

It will be seen that, by using separate pipes in the manner shown, I am able to utilize the space which is usually taken up by the timber joists, and at the same time without additional room increase or produce a condensing-surface equivalent to the tanks themselves, and of course the drying and circulating of the air will be in the same ratio.

It must be understood that while but one surface (the outside) of tank is used as a condensing-plate, the pipes count double by having the circulating air come in contact with both the outside and inside surfaces of the same.

The partition in front of tanks and pipes forms a congealing and drying chamber separate from the preserving-room, through which the entire atmosphere of the inclosed room is constantly and automatically passing, leaving its heat and moisture there at each revolution.

Having thus described my invention, what I claim is—

1. The combination of closed metallic tanks for containing the refrigerating material, and the air-circulating tubes fixed vertically to the exterior of the walls of the tanks, and having their upper and lower ends open and their upper ends terminated below the tops of the tanks, whereby the condensed moisture is col-

lected upon the interior and exterior of the tubes, substantially as described.

2. The combination of closed metallic tanks for containing the refrigerating material, and the metallic air-circulating tubes fixed vertically upon all sides of the exterior of the tanks and having upper and lower open ends, the open upper ends terminating below the tops of the tanks, whereby the tanks are braced and the condensed moisture collected upon the interior and exterior of the tubes, substantially as described.

3. The combination of a preserving-compartment, a series of closed metallic tanks arranged therein adjacent to but separated from one wall of the preserving-compartment, the metallic air-dividing and condensing partition arranged at a distance from one side of the tanks, the air-circulating pipes fixed vertically

to the sides of the tanks between their outer sides and the walls of the preserving-compartment, similar pipes interposed between the tanks, and air-circulating pipes fixed vertically to the sides of the tanks between the latter and the air-dividing and condensing partition, said pipes having upper and lower open ends, and their upper ends terminated below the tops of the tanks, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WARREN A. CHASE.

Witnesses:

FISHER AMES,

THOMAS F. FEE.