

(No Model.)

G. C. PERKINS.  
REFRIGERATOR.

No. 598,006.

Patented Jan. 25, 1898.

Fig. 3

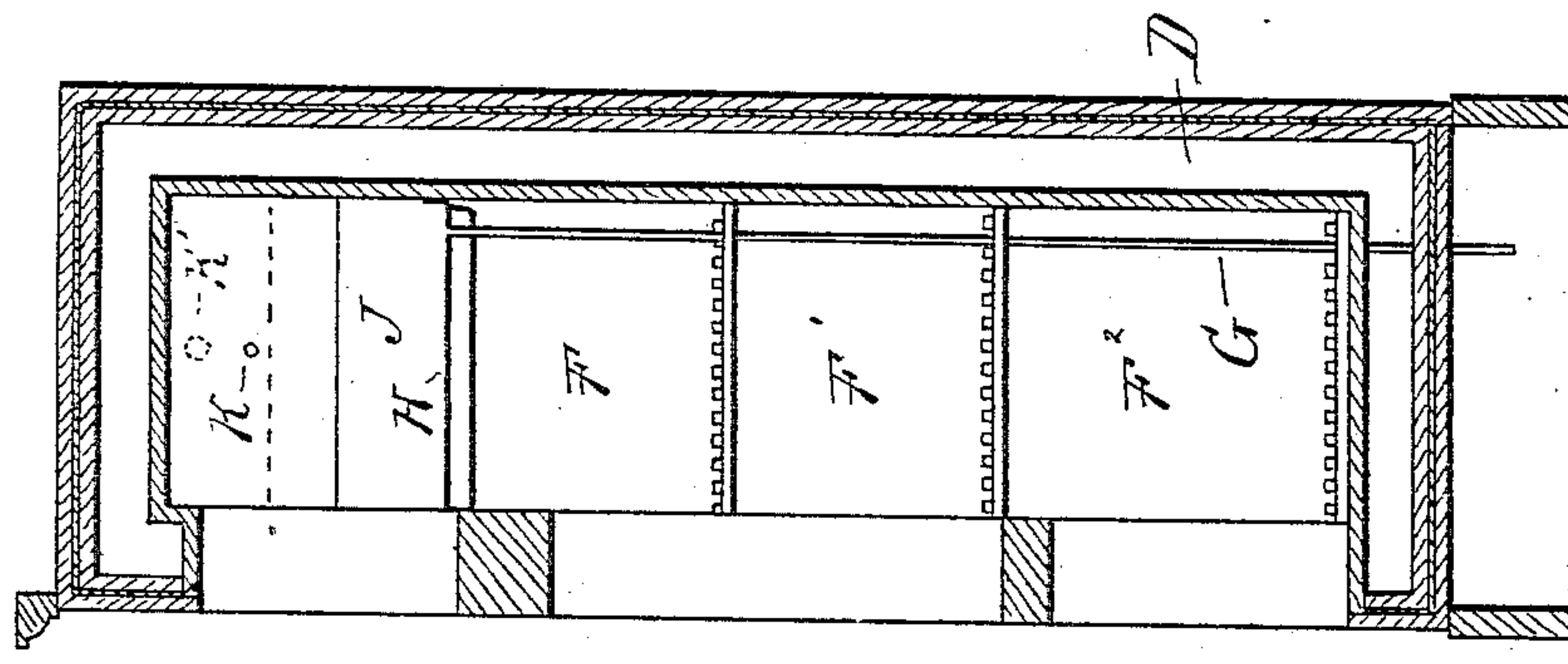


Fig. 1

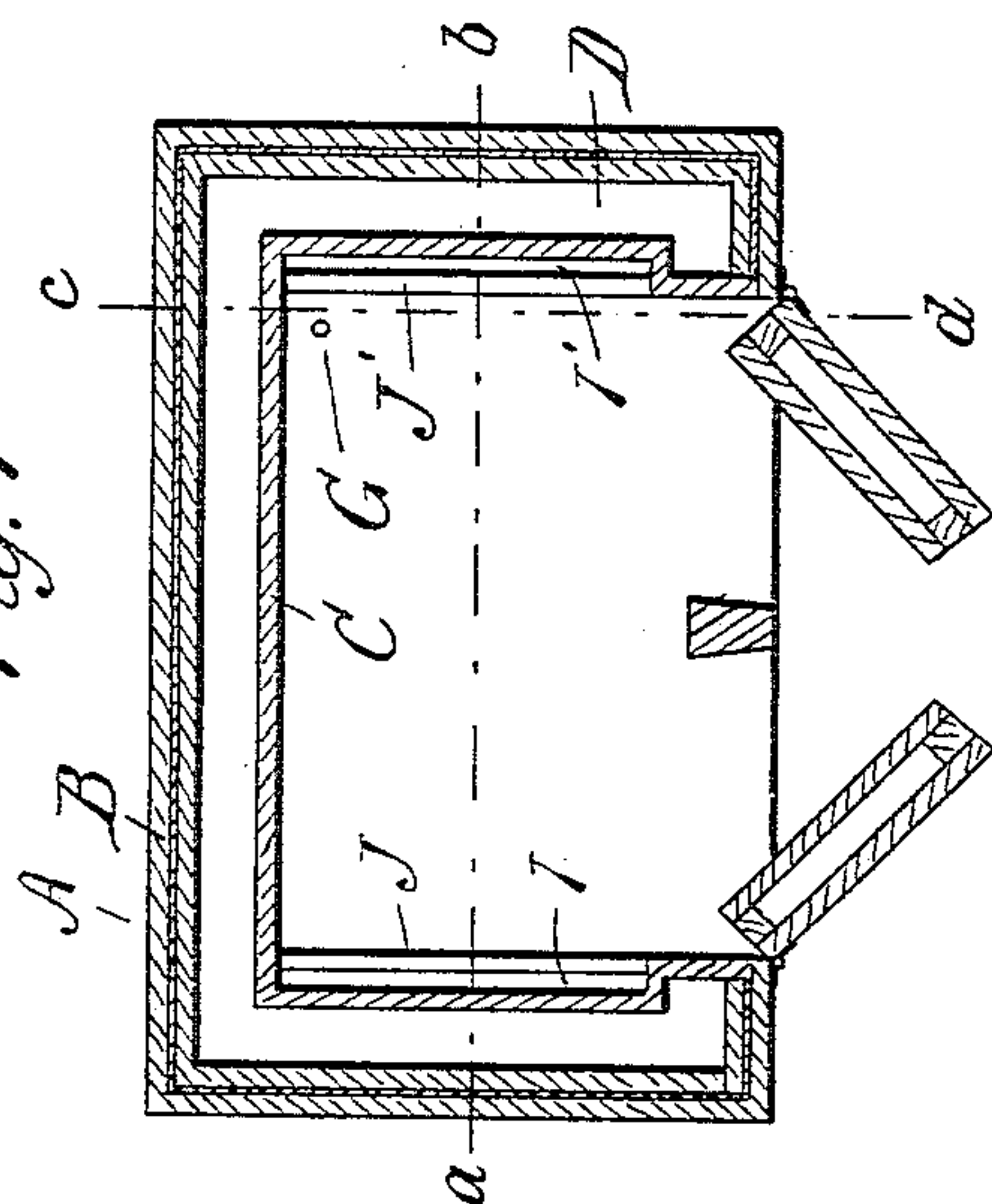
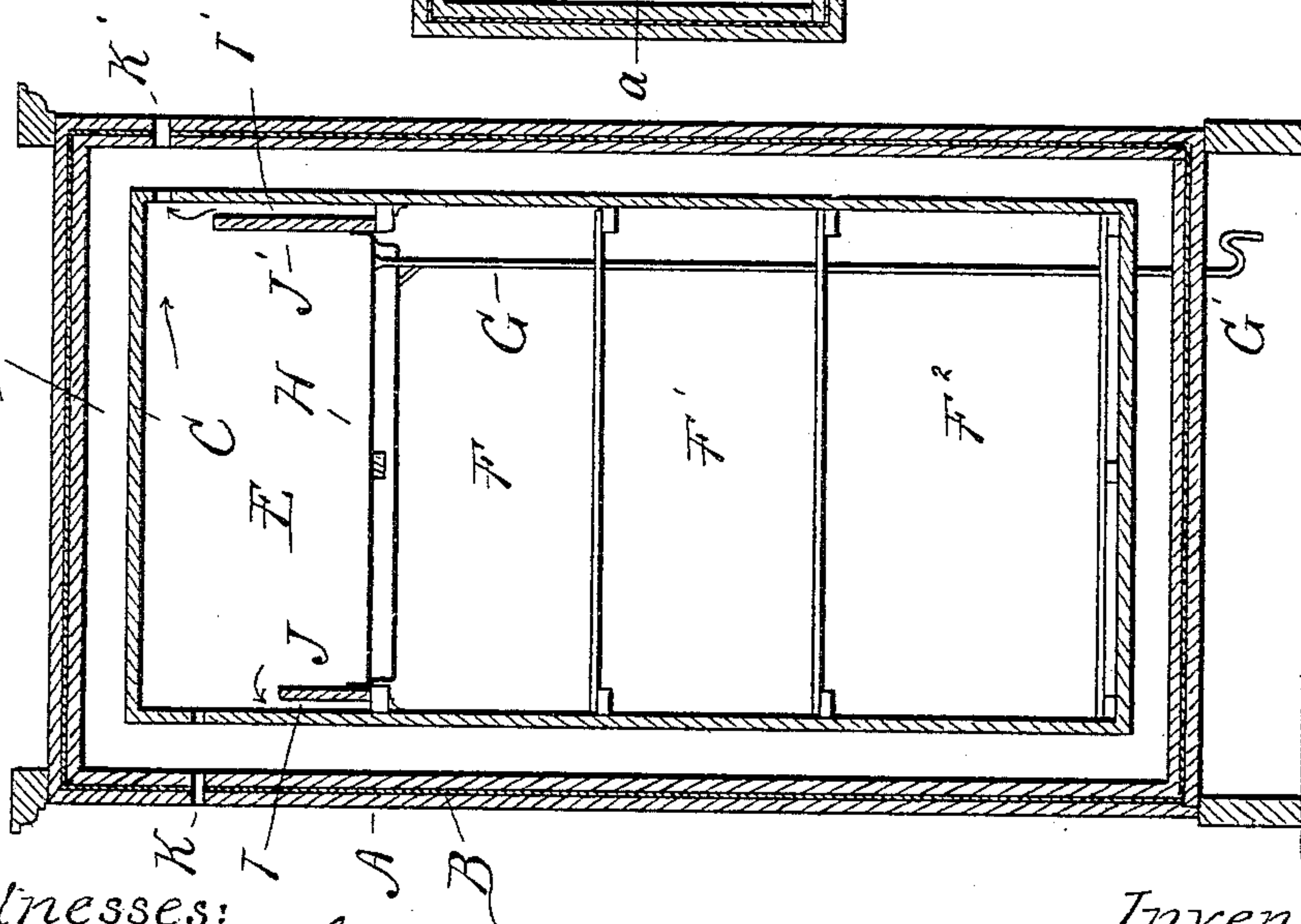


Fig. 2



Witnesses:  
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By *Mos Spangenberg* Att'ys.



# UNITED STATES PATENT OFFICE.

GEORGE C. PERKINS, OF DETROIT, MICHIGAN.

## REFRIGERATOR.

SPECIFICATION forming part of Letters Patent No. 598,006, dated January 25, 1898.

Application filed October 26, 1896. Serial No. 610,111. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE C. PERKINS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Refrigerators, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention refers principally to an improved ventilation for refrigerators, and the principal object is to produce a greater economy in the use of ice than has been obtained heretofore; and to this end I base the construction of my refrigerator upon the following leading principles: first, to keep ice in a closed receptacle from wasting the top of the receptacle must be thoroughly ventilated; second, no outside air must be allowed to come in contact with the ice, and thus no air should be admitted at the bottom or in any manner which would cause it to circulate in contact with the ice.

While these principles are of very simple application in the construction of an ice-house, they are difficult to carry out in a refrigerator in which it is the paramount requirement that cold air should circulate through the refrigerating-chamber, and the cold air thus circulated should be gradually removed as it becomes foul or contaminated by contact with the food and the vapors emitted therefrom, which requirement therefore demands an admission of fresh air to the ice.

My invention therefore consists in a refrigerator in which an interior circulation of the cold air is provided through the refrigerating-chamber with constant and gradual renewal of such cold air as it becomes contaminated, while at the same time the top of the refrigerating-chamber is constantly ventilated, all in a manner to prevent the air admitted from the outside to circulate in contact with the ice, as more fully hereinafter described.

My invention consists also in the peculiar arrangement of parts whereby the inside walls of the refrigerating-chamber are prevented from becoming moist and thereby form a source of generating foul air.

Figure 1 is a horizontal section through the upper part of the refrigerator in which the ice is kept. Fig. 2 is a vertical central sec-

tion on line *a b* of Fig. 1. Fig. 3 is a similar section on line *c d* of Fig. 1.

A are the outer walls of a refrigerator made of two thicknesses of board all around, with a layer B of felt or like non-conducting material inserted between. Within these outer walls is inclosed the refrigerating-chamber C, built of a single thickness of board, with an air-space D separating it all around the top and bottom from the outer walls of the refrigerator. This refrigerating-chamber is divided into the upper compartment E for the ice and several lower compartments F F' F<sup>2</sup> for the reception of the articles of food to be preserved. These separate compartments have, as usual, suitable doors in the front for access thereto.

The bottom H of the higher receptacle E is made imperforate and constitutes a pan for the collection of the water from the melting ice, which water is carried off through a suitable drip-pipe G, passing out through the bottom and provided with the usual goose-neck trap G', all in the usual manner. The bottom H of this higher receptacle does not extend quite to the side wall of the refrigerating-chamber, but forms small openings at the opposite ends, which openings are continued upwardly by means of end partitions communicating at different heights with the upper compartment, which partitions I have conveniently shown in the form of boards J J', extending some distance above the floor H, the arrangement being such that at one side, which I call the "air-inlet" side, the end board J is considerably lower than on the other end where it extends higher up. In this manner air-ducts I I' are formed, through which the compartment E communicates with the refrigerating-compartments F F' F<sup>2</sup> below, the floors or division-walls of which are merely composed of slatted shelves, through which the air can freely pass.

The ice-holding compartment E communicates with the outside air through two apertures K and K', the latter of which is located at or near the top of the ice-compartment, while the former is lower down and is also made of lesser area than the aperture K'. Both of these apertures extend through the outer walls A and inner walls C and commu-



nicate freely into the air-space D between the two walls.

In practice the operation of the refrigerator is as follows: The air in contact with the ice in the compartment E becoming cooled and heavy will gradually overflow over the partition J, as the higher board J' will prevent it from flowing down on the other side. It will thus flow down through the air-duct I and thence through the different compartments to the bottom of the refrigerator and thereby displace an equal quantity of less cold and, therefore, lighter air, for which the only exit is by way of the passage I' in the upward course into the top of the ice-compartment, and as it becomes warm and expanded it will naturally seek an exit through the higher opening K'. At the same time by the proximity of the opening K to the air-duct I the outflow of cold air over the partition J will induce an inflow of fresh air through the opening K; but this air will only mingle to a slight degree with the cold air surrounding the ice, and that only after it becomes suitably cooled down to the temperature of said air. For the same reason it is also cut off from flowing down through the duct I, as it is warmer and much lighter. Its course will therefore be to the desired extent across the top of the compartment E toward the opening K', and thus form the desired top ventilation of the refrigerator without carrying any wasteful air-current around or in contact with the ice from which it is kept by the cold body of air retained in the compartment E around the ice up to the height of the board J.

By this arrangement I produce great economy in the use of ice, and at the same time the air is suitably circulated and renewed within the refrigerating-compartments to make the refrigerator efficient.

It will further be seen that by reason of the air-space D, surrounding the inner chamber C, which is only of single thickness, the air therein will become cooled off in contact with the walls C, and therefore prevent condensation of moisture on the inner faces

thereof. At the same time a slight circulation of air may take place through this air-space sufficient to prevent it from becoming filled with moist air by reason of its communicating with the apertures K K'.

What I claim as my invention is—

1. In a refrigerator, a refrigerating-chamber having an upper and lower compartment, two vertical end partitions in said upper compartment forming between them and the adjacent upright walls of the refrigerating-chamber narrow air flues or passages communicating with the upper compartment at different heights and communicating with the lower compartment at or near its top, the refrigerating-chamber having air-passages through the upright walls thereof into the top of the upper compartment, the air-passage adjacent the flue having the lower communication with the upper compartment being located below the air-passage adjacent the other air-flue, substantially as described.

2. In a refrigerator the combination of the outer inclosing walls of non-conducting construction, a refrigerating-chamber inclosed within and having its walls separated by an air-space from the outer walls, an upper compartment for the ice formed in said refrigerating-chamber, two vertical end boards of different heights in said compartment forming narrow vertical air-flues between them and the side walls of the refrigerating-chamber respectively and through which the upper compartment communicates into the compartment below, and air-passages connecting the ice-holding compartment upon the sides near the top directly with the outer air, said passages being placed above the end boards at different heights respectively and communicating also into the air-space between the outer walls and the refrigerating-chamber.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE C. PERKINS.

Witnesses:

M. B. O'DOHERTY,  
OTTO F. BARTHEL.