

(No Model.)

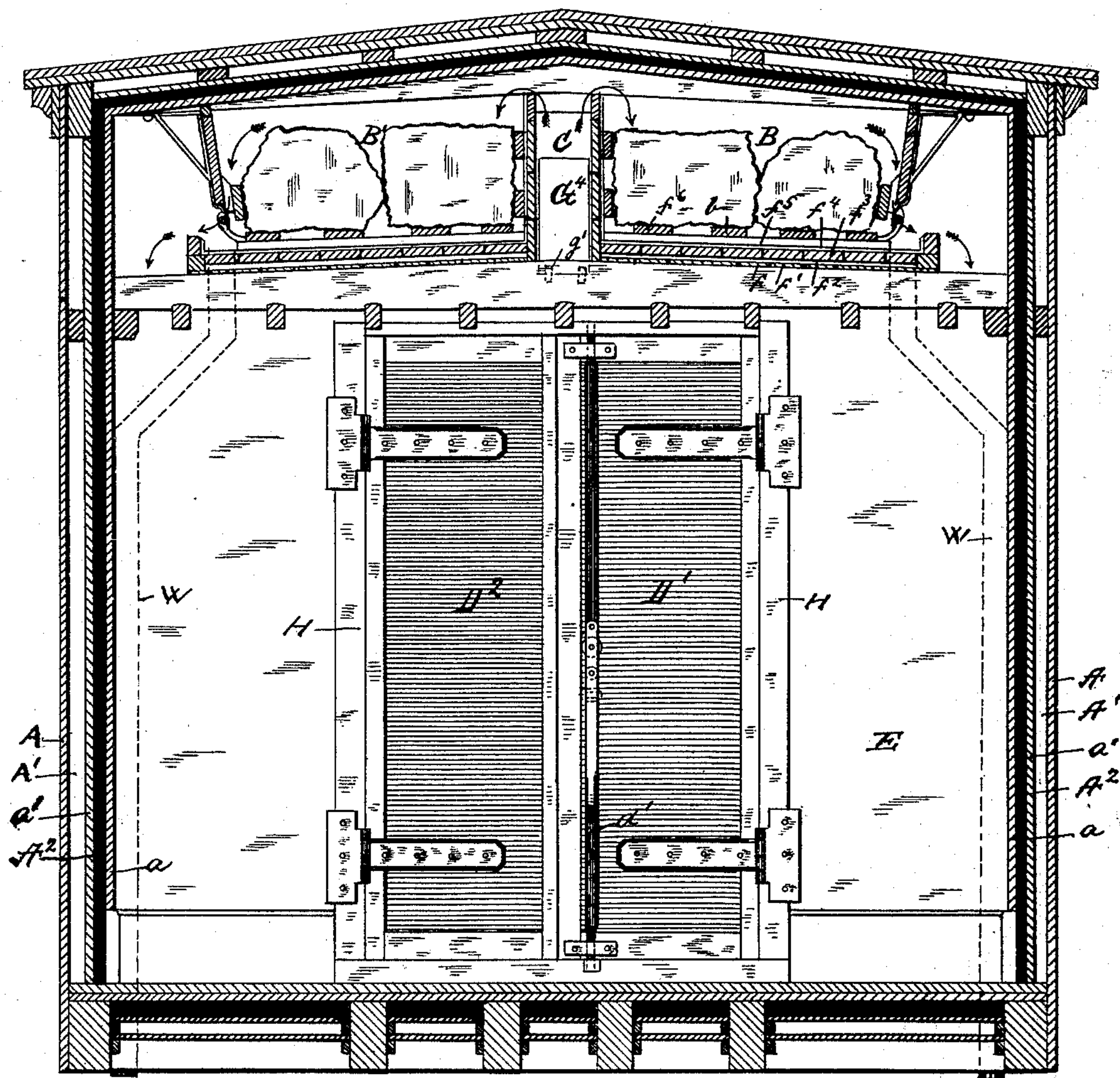
3 Sheets—Sheet 1.

H. C. GOODELL.
COMBINED REFRIGERATOR AND FRUIT CAR.

No. 483,552.

Patented Oct. 4, 1892.

Fig. 1.



WITNESSES:

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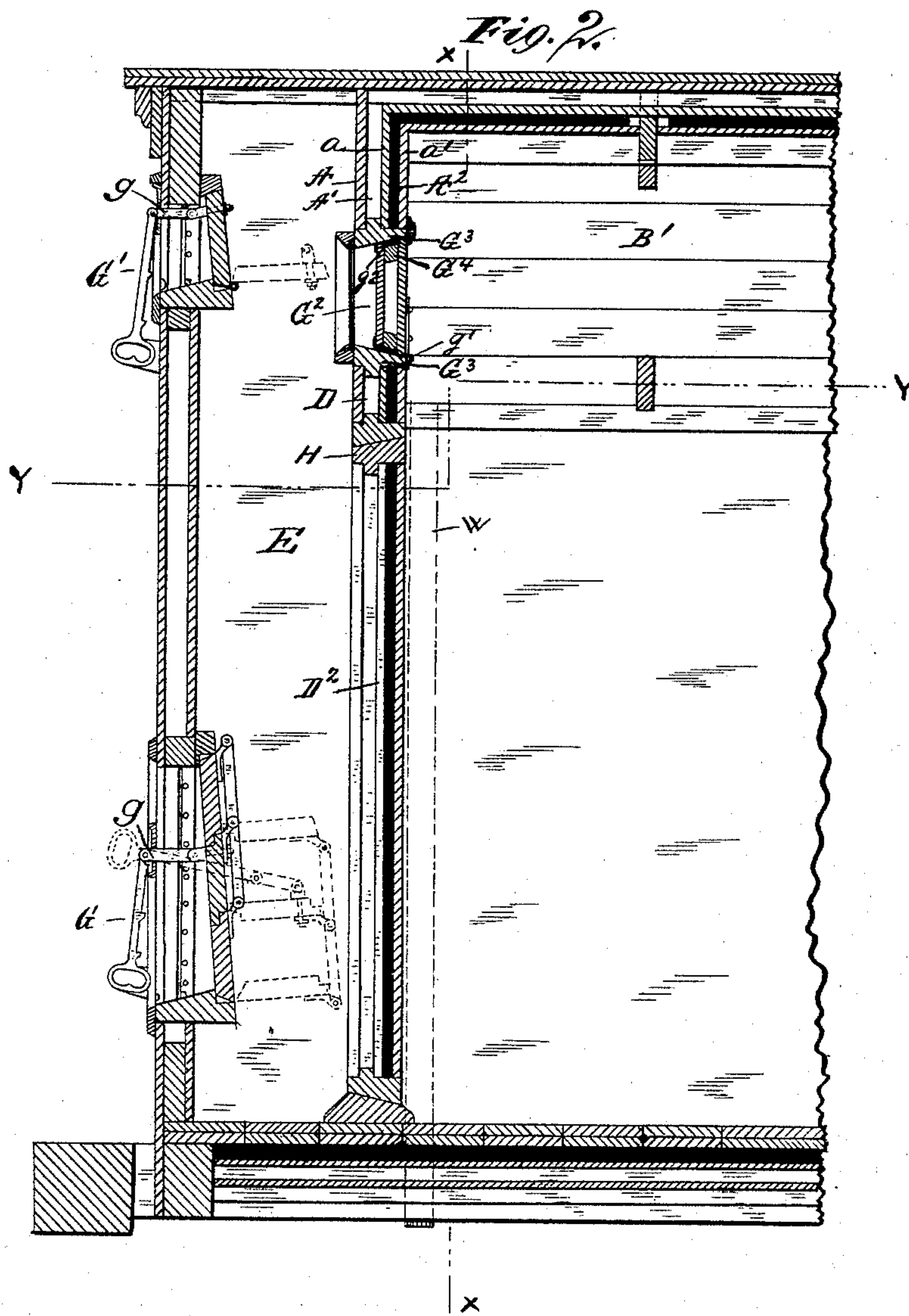
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3 Sheets—Sheet 3.

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Fig. 3.

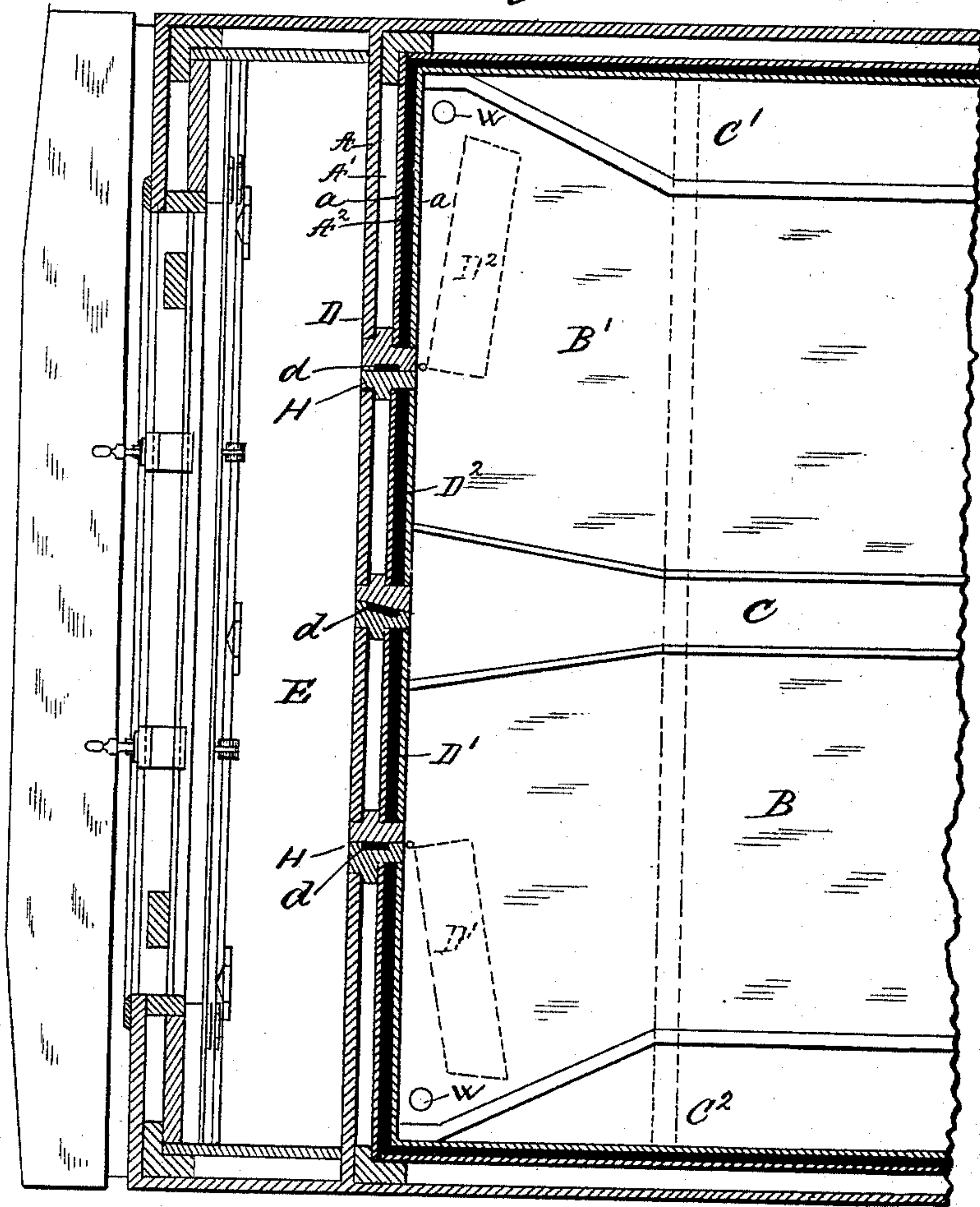


Fig. 4.

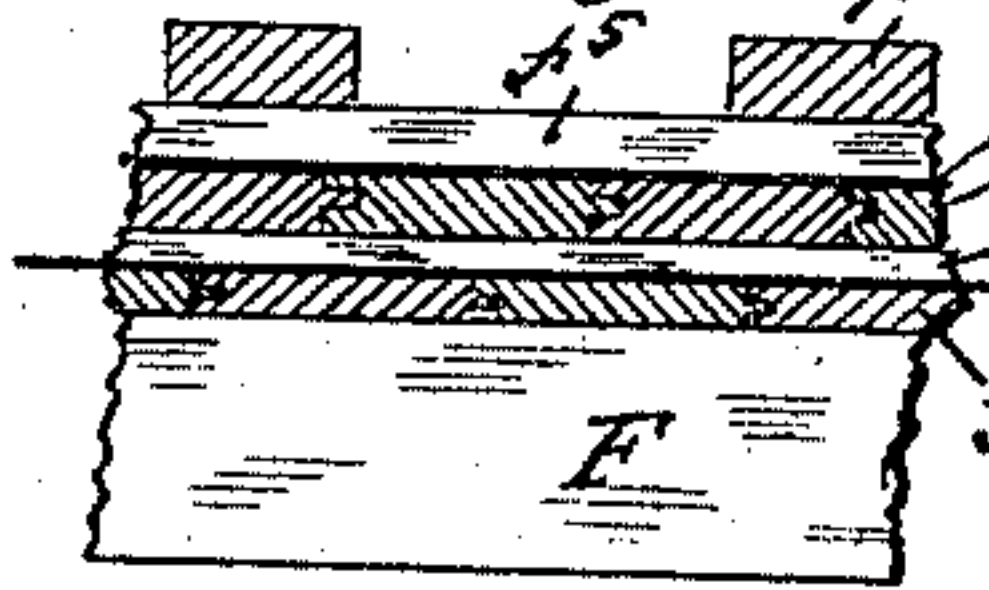
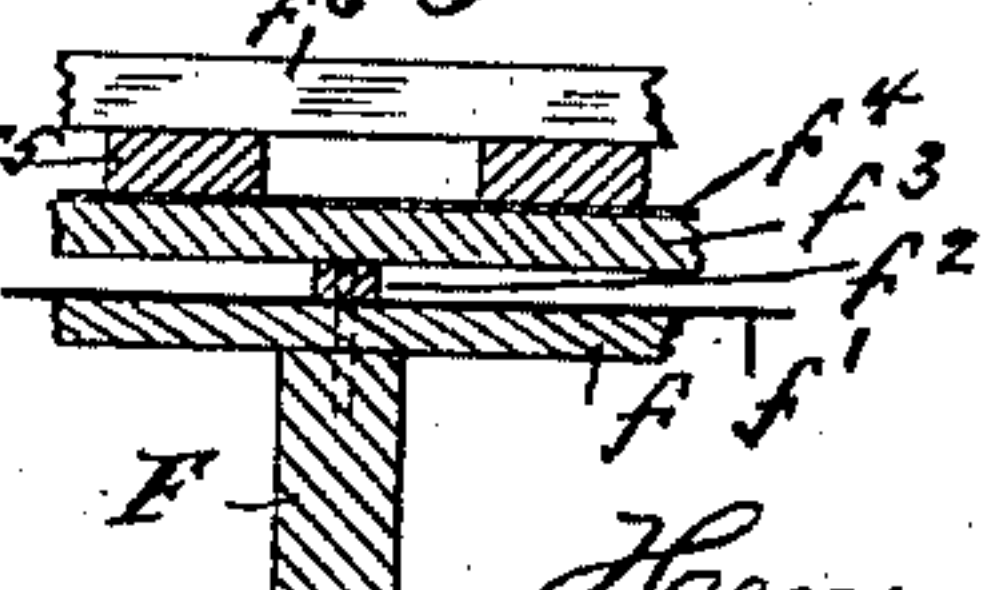


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY CARR GOODELL, OF ATCHISON, KANSAS.

COMBINED REFRIGERATOR AND FRUIT CAR.

SPECIFICATION forming part of Letters Patent No. 483,552, dated October 4, 1892.

Application filed February 1, 1887. Serial No. 226,171. (No model.)

To all whom it may concern:

Be it known that I, HENRY CARR GOODELL, of Atchison, in the county of Atchison and State of Kansas, have invented a new and useful Improvement in a Combined Refrigerator and Fruit Car; and I hereby declare the following to be a full and clear description thereof.

This invention relates to an improvement in refrigerator-cars as heretofore patented and used by me, (reference is here made to my patent, No. 300,596;) and it consists in placing in said refrigerator-cars a diaphragm-partition near the end thereof, so as to form an air-chamber thereby, into which outside atmospheric air is admitted through properly-arranged ventilators and from which it is sent into the storage-room of the car in the manner hereinafter described, and also in such details of construction as are required to make this a thoroughly complete and practical improvement, as will hereinafter more fully appear.

The invention will be readily understood by reference to the accompanying drawings, of which—

Figure 1 is a transverse sectional elevation of my improved car, taken on the line xx of Fig. 2, looking toward the end of the car. Fig. 2 is a central longitudinal sectional elevation of the end portion of the car, showing the air-chamber and the diaphragm-partition which separates it from the storage-room. Fig. 3 is a sectional plan of the top portion of the end part of a car, taken on the line yy through the air-chamber, at end of car and through the ice-boxes that are located in that part of the structure. Figs. 4 and 5 are respectively a transverse and a longitudinal sectional elevation in detail of a part of the floor forming the bottoms of the ice-boxes and the top of the storage-room.

The general construction of the storage or transportation room of the car is quite similar to structures heretofore patented and used by me for refrigerator-cars, &c. It has an outer wall A , with inner walls a and a' , which together form insulating-chambers A' and A^2 around the sides of the inclosed storage-compartment. The outer insulating-chamber A' , I leave open to form an air-insulator to the compartments within, and the inner chamber A^2 , I fill with some suitable insulating mate-

rial, like charcoal, lamp-black, mineral wool, or other good non-heat-conducting material.

As in my former structures of a similar character, I place at or near the top of the refrigerating-compartment two ice-boxes B and B' , with a central air-duct C between them, and similar air-ducts C' and C^2 at the sides of the said ice-boxes and between them and the outer side walls A and a' , as shown clearly in Fig. 3. The ribs b form the rack at the bottoms of the ice-boxes on which the ice is laid.

At or near the corners of the ice-boxes or in other convenient locations are placed properly-trapped drainage-pipes W , through which the meltage from the ice in the boxes B and B' , respectively, escapes.

As in the cars and similar structures formerly invented and used by me, the ice-boxes B and B' are placed at or near the top of the car or compartment, as above described, and the storage-room is placed below them, and the whole structure arranged so that the warm air of the storage-room will rise up through the central air aperture or duct C , and thence pass over and through the ice-boxes, where it will become cooled, and then again descend to the storage-room below through the side apertures or ducts C' and C^2 .

In this invention the ice-boxes and storage-room are not continued to the end of the car, but are cut off a short distance therefrom, as in Figs. 2 and 3, by a diaphragm-partition D , so as to form between the said partition and the contiguous end of the car an air-chamber E . The said diaphragm-partition is provided with a pair of bevel-edged folding doors D' and D^2 , arranged to close air-tight into a bevel-edged frame H in the said partition by means of suitable packing-strips d , of some soft material like leather, felt, canvas, or such other like article, and they are also provided with suitable catches d' to hold them in their closed position. The wall or partition D is of a similar insulated construction to that already described for the outer wall of the car.

The floor forming the bottom of the ice-compartments B and B' is constructed as shown in detail in Figs. 4 and 5. First, a tight boarding f is laid on top of the transverse beams F , and this boarding is then covered with a water-tight covering f' of tarred paper, felt, or other similar material, and on

top of this I lay transverse strips f^2 over the beams F, as shown in Fig. 5, and on top of these strips I lay another tight boarding f^3 . All these are securely fastened to the beams f by nailing or other equivalent fastening means, and then I roof this boarding over with a tight sheet-metal roofing f^4 . The tight roofing f^4 receives and discharges through the waste-pipes W the meltage from the ice, and the water-tight covering f' prevents any condensed moisture from accumulating on the bottom side of the roofing f^4 and from going down into the storage-room below. On top of the roofing f^4 I lay the wooden rack-pieces f^5 and f^6 , which form the bottoms of the ice-boxes and sustain the ice resting therein. The bearing-strips f^2 , interposed between the boardings f and f^3 , form air-spaces between the said boardings, and thereby form an insulating-space between the ice-boxes and the storage-room below them. The structure thus constructed is provided with air inlets or valves G and G', of any well-known or suitable construction, placed in the end wall of the car and adapted to admit an adjustable quantity of outside atmospheric air into the air chamber or compartment E, from which the air so received may be admitted to the storage-room through the doors D' D² and an inlet-duct G². The said inlet-duct G² is placed in the upper end of the diaphragm-partition and in such a location as to deliver the air to the storage-room through the central duct C. The air-inlet doors G and G' are placed, respectively, near the bottom and near the top of the end of the car, so as to regulate at will the upward or downward flow of the air, as required. Each of the said inlet doors or gates G G' are provided with suitable gratings to exclude dust or anything else not desired within the structure, and also with suitable levers or latches g for operating them and fastening them in any desired position, either open or shut.

The inlet-duct G² is constructed with beveled jamb-pieces G³, which form the framework of said duct, and are adapted to receive the bevel-edged door G⁴, which is hinged at g' to the jamb-piece G³. The door G⁴ is provided with packing-strips g^2 of rubber, leather, felt, canvas, or any other suitable material, so that when shut it will be air-tight, and the incoming current of air will be prevented from passing into and through the duct G² and through the central duct C.

In the transportation of beef and other meats for long distances refrigeration is of the first importance, while in the transportation of fruit the greatest amount of ventilation is required, with only sufficient refrigeration to preserve an even temperature as near as possible. This is especially the case when passing through sections of country where the temperature is warm during the day and cold during the night.

This invention constitutes a combined refrigerator and ventilated fruit-car, and in it

facility is afforded for adapting it to the transportation of meats, fruits, and all other provisions or substances of a perishable nature by providing for adjusting the apparatus so as to secure the exact proportion of refrigeration or ventilation, or both, which may be required by the character of the articles to be transported. Thus, for example, when the apparatus is to be used only as a refrigerator-car the air-inlet valves G and G' and the doors D' D² G⁴ may be tightly closed. When the car is to be used for transporting fruit, where perfect ventilation is of the first importance, all or any desired number of the inlet and outlet valves and doors may be opened, so that a free and unobstructed current of air may be allowed to pass through the storage-compartment, and said valves and doors may be so regulated as to provide for passing either the whole or a portion of said current through the top or the bottom of the car, as may be desired. The gases and evaporation arising from the fruits naturally ascend to the top of the car, and by the opening of the upper inlet and outlet valves and ducts provision is made for carrying off said gases without passing the current directly through the fruit itself.

It is obvious and it has been proven by practice that the perfect system of ventilation and circulation of air provided for in this invention could not be accomplished in any other manner than that above described or in some similar manner, such as is described in my application, Serial No. 226,172, filed on the same date herewith, for if the inlet and outlet apertures were arranged in the sides of the car the only circulation possible would necessarily be such as would result from the operation of the vacuum caused by the passage of the car, and would consequently be imperfect, while by having said apertures in the ends of the car all the current and circulation of air, whether great or small, are necessarily always in line with the line of travel of the car, and perfect ventilation is thereby secured.

It has been proven by practice that this car provides for the successful transportation of deciduous fruits for long distances during the heated summer months, by reason of its thoroughly-ventilated ends and thoroughly-insulated diaphragm-partitions and side walls, whereby all the air required to pass through the fruit can be obtained by the ventilation, while the insulation prevents the sun's rays from penetrating the walls to change the temperature within. It is equally obvious that in the long-distance transportation of citrus fruits should a cold temperature be encountered and the ventilators require to be closed the insulated walls will protect the fruits from being chilled or frozen.

I am aware that numerous patents have been granted for ventilating refrigerator-cars, examples of which are found in the patents of Potts and Lamason, dated June 28, 1870, No.

104,765; B. N. Bugbey, dated January 9, 1883, No. 270,383; P. C. Nissen, dated June 26, 1883, No. 280,224, and others; but such is not the object of my invention.

5 My invention is a combined refrigerator and ventilated fruit car—that is to say, it is a refrigerator-car and a ventilated fruit-car combined in one structure. The car can be used at one time as a refrigerator, in which
10 case it is tightly closed, and at another time as a ventilated fruit-car, in which case the ventilators are open and refrigeration is not necessary.

I do not claim in this application a venti-
15 lated refrigerator-car; neither do I claim a car which can be used as a refrigerator only, nor a car which can be used as a fruit-car only.

Having thus fully described my invention, what I claim as new, and desire to secure by
20 Letters Patent, is—

1. In a refrigerating and ventilating car, an ice-chamber in the upper part of the car, an independent storage-chamber beneath the same, ventilating gated openings in each end
25 of the car in line with each other and with the ice-chamber, and ventilating gated openings at each end of the car in line with the storage-chamber and with each other, and means for independently controlling said
30 openings, substantially as described.

2. In a refrigerating and ventilating car, an ice-chamber extending along the upper
35 part of the car, an independent storage-chamber beneath the same, partition-walls intermediate of the end walls, forming the end walls of the ice and storage chambers, independently-controlled gated openings in said partitions at each end in line with each other, one pair being in line with the ice-chamber
40 and the other pair with the storage-chamber, and a gated opening in each end wall of the car, substantially as described.

3. In a refrigerating and ventilating car,

an ice-chamber extending along the upper
part of the car, an independent storage-cham- 45
ber beneath the same, partition-walls intermediate of the end walls, forming the end walls of the ice and storage chambers, inde-
pendently-controlled gated openings in said
partitions at each end in line with each other, 50
one pair being in line with the ice-chamber and the other pair with the storage-chamber, and corresponding and independently-con-
trolled gated openings in each end wall of the
car at the upper and lower part thereof, sub- 55
stantially as described.

4. In a refrigerating and ventilating car, an ice-chamber in the top of the car, compris-
ing two ice-boxes with a space between them
centrally, partition-walls forming the ends of 60
the ice-chamber, a gated opening in each partition-wall in line with said central passage between the ice-boxes, an independent stor-
age-chamber beneath the ice-chamber, the
partition-walls also forming the end walls of 65
said chamber, gated openings in said walls in line with the storage-chamber and with
each other, and gated openings in the end
walls of the car, substantially as described.

5. In a refrigerating and ventilating car, 70
an ice-chamber in the upper part of the car, a storage-chamber beneath the same, parti-
tion-walls intermediate of the end walls of the car, forming the end walls of the ice and
storage chambers, ventilating gated openings 75
in said partition-walls in line with each other and with the storage-chamber, and ventilat-
ing gated openings in each end of the car, substantially as described.

In witness whereof I have hereunto set my 80
hand in presence of two witnesses.

HENRY CARR GOODELL.

Witnesses:

E. L. RICHARDS,

WM. E. RICHARDS.