

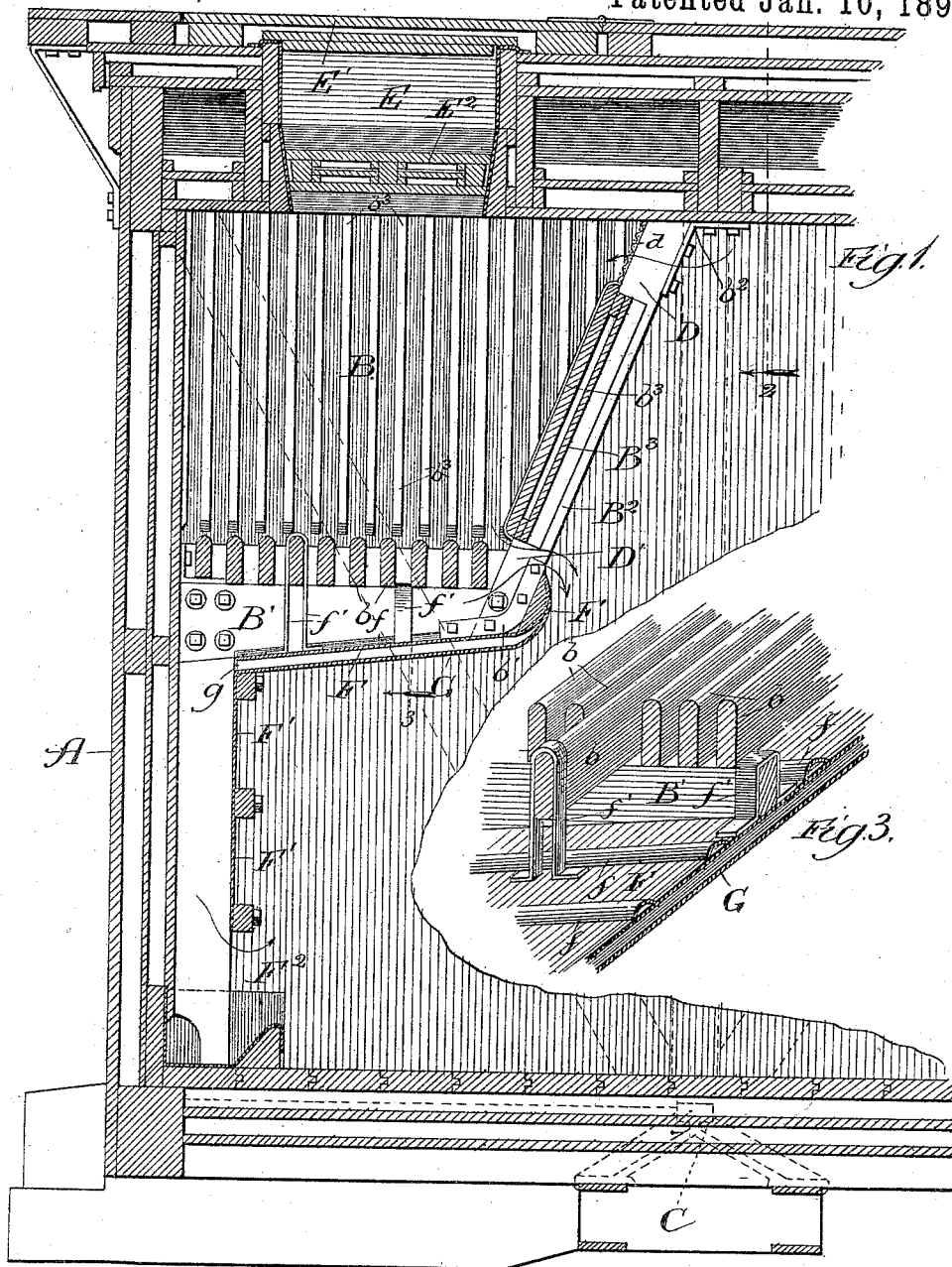
(No Model.)

2 Sheets—Sheet 1.

G. B. ROBBINS.  
REFRIGERATOR CAR.

No. 489,759.

Patented Jan. 10, 1893.



Witnesses:  
*Charles E. Gaylord,*  
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Inventor:  
*George B. Robbins,*  
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*Attys.*

(No Model.)

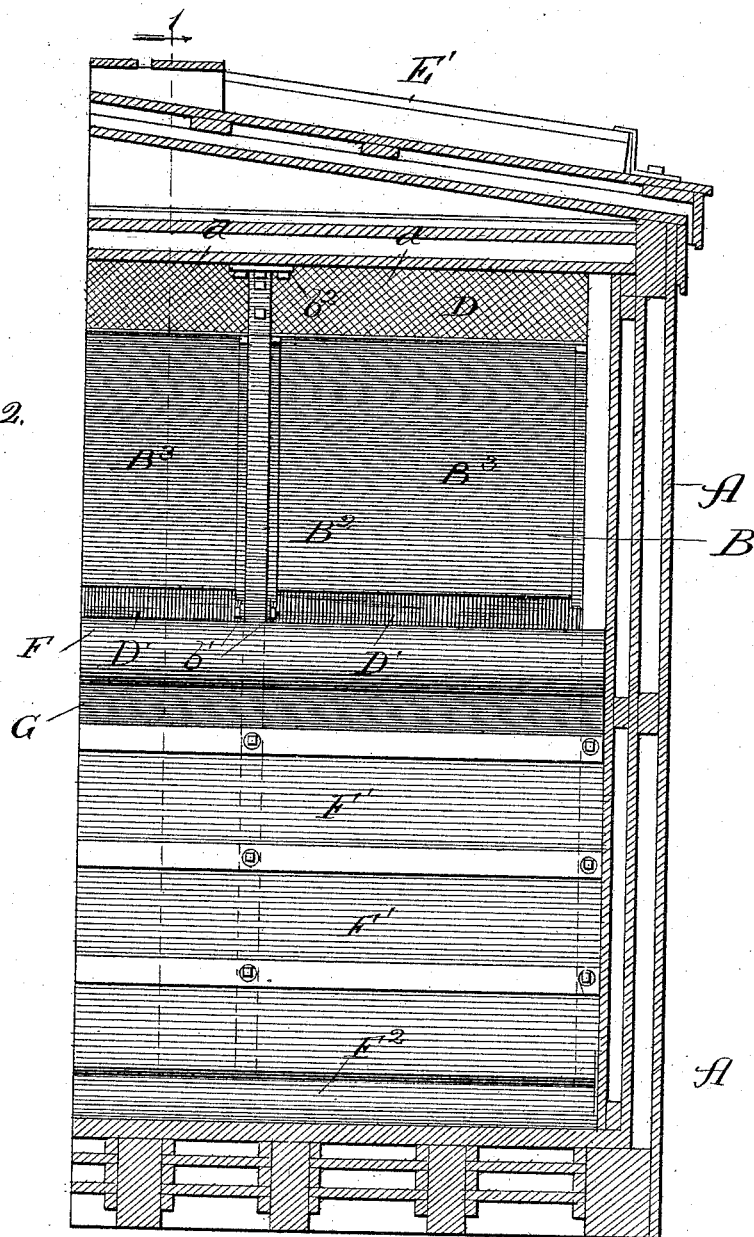
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Fig. 2.



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# UNITED STATES PATENT OFFICE.

GEORGE B. ROBBINS, OF HINSDALE, ILLINOIS.

## REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 489,759, dated January 10, 1893.

Application filed May 31, 1892. Serial No. 434,868. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE B. ROBBINS, a citizen of the United States, residing at Hinsdale, Du Page county, Illinois, have invented certain new and useful Improvements in Refrigerator-Cars, of which the following is a specification.

Refrigerator cars are used, as is well known, for the transportation of perishable articles, such as fruit, meats, &c., which require to be carried at low temperature to insure their arriving at their destination in prime condition.

Among the requirements of a perfect refrigerator car are; that it shall be so constructed as to afford the necessary amount of space for the ice or other cooling medium, while interfering as little as possible with the receptive capacity of the car, in order not to unnecessarily diminish the quantity of freight that can be contained and transported therein. Secondly, it is essential that the receptacle for the ice shall be so constructed and located as to permit and insure a circulation of the air currents throughout the car, which circulation shall be free and unimpeded, and so directed and controlled that the air shall reach every part of the car, since it is obvious that if the currents are misdirected or obstructed the temperature of certain portions of the interior of the car may rise above the point necessary to insure the arrival of the freight in proper condition. Again, it is desirable not only that the ice receptacles be so located and constructed as to interfere as little as possible with the capacity of the car, but also that the construction of the car shall be such that the weight of the ice shall be carried by such parts of the car structure as are best adapted to bear the load, and also that these receptacles, &c., shall be made in a manner that will admit of ready access to their interior, while still properly supporting the ice. Other desiderata include provision for disposing of the melted ice, for preventing the entrance of dust, warm air, &c.

While these cars have been constructed in a great variety of forms, some of which contain to a greater or less extent the essentials above pointed out, I am not acquainted with any prior construction wherein the theory of

current circulation has been so embodied and carried out as to insure the perfect operation of the car under all conditions and circumstances; nor with any car embodying within itself all or the greater part of such essentials. Having therefore these requirements and the defects in previous constructions before me, I have sought to devise a car wherein the currents shall be directed and controlled in such manner as to produce the highest efficiency, while at the same time the construction of the car shall be such that it will comply with the essential requirements as to space, &c., and to this end I have devised a car, which, in my judgment, approaches more nearly than any other with which I am acquainted, to the practical and theoretically perfect car; and my invention consists in the features and details of construction hereinafter described and claimed.

In the drawings, Figure 1 is a vertical section of one end of a refrigerator car constructed in accordance with my invention, taken on line 1 of Fig. 2; and Figs. 2 and 3 are sections taken on lines 2 and 3 of Fig. 1, respectively, each of the above sections being taken in the direction indicated by the respective arrows.

The car A, except as hereinafter particularly pointed out, may be made of any desired form or dimensions, and, being well known, requires and will receive no further description. Across each end of this car, preferably adjacent to the roof thereof, is placed a box or receptacle B, intended to contain the ice used for maintaining the requisite temperature in the car. The bottom of this box is composed of strips of wood or other suitable material *b*, preferably rounded or beveled on their upper sides and supported by means of arms *B'*, which are bolted as shown to the posts or timbers of the car at their outer ends. Attached to the inner ends of these arms *B'*, by means of straps *b'*, are bars *B<sup>2</sup>*, which run in a preferably slanting direction up to the roof of the car to which they are secured by means of straps or hangers *b<sup>2</sup>*, these hangers being preferably fastened to a carling supported on posts placed at a point above the transom C, for reasons to be hereinafter pointed out. To these bars

B<sup>2</sup> is secured the front or inner sides B<sup>3</sup> of the receptacle, this being so constructed as to leave an opening D between its upper edge and the roof, and an opening D' between its lower edge and the slats *b*, the arrows in these openings indicating the action of the air currents hereinafter to be described. The opening D is preferably covered with a netting *d* to prevent particles of ice from escaping into the car. The interior of the box is preferably protected by means of strips *b*<sup>3</sup>, of wood or other suitable material, fastened to its sides, though, if desired, metallic sheets may be used in place of these strips.

The car roof is provided with an opening E, situated at a suitable point above this box for the introduction of ice, and normally closed by a hinged door E' and a plug E<sup>2</sup>, which plug is preferably beveled and fits against the sloping or beveled sides of the opening E, being held in place by its own weight.

Attached at any suitable point beneath the slats *b*, preferably to the under sides of the arms B' is a plate of metal F, which serves as a pan to catch the melted water from the ice. This plate extends back in a slanting direction to a point near the end of the car, where it turns and runs downward in a substantially vertically plane, as shown, thereby forming a flue or channel F' for the passage of water and air. The lower end of this flue opens, as indicated by the arrow, into the car, and beneath such end is a well or trough F<sup>2</sup> provided with a suitable discharge outlet, and adapted to receive water, &c., as it is discharged from the flue.

To strengthen the plate F, I prefer to provide strips *f*, of a half round or angular shape, which are secured across this plate at suitable intervals; but, if desired, I can use in addition to or instead of these strips, to prevent the plate from sagging, hangers *f'*, which pass over either the arms B' or the slats *b*, and are secured at their lower ends to the plate F, these means of stiffening being shown more particularly in Fig. 3. The pan F connects, as shown by the arrow, with the opening D'. It is possible that this pan will sweat, or that water will collect upon its under side and drop down upon the floor, and since the ice box is so located as to provide room beneath it in which to store freight being transported which might be wet or injured by this falling water, I deem it advisable to provide means for preventing any such damage, and for this purpose I support a supplementary plate G beneath and substantially parallel to the plate F, which will receive any such water and discharge it into the flue through an opening *g* provided for that purpose.

The car having been constructed and put together as above described, its operation, together with the advantages incident thereto, are as follows: When ice is placed in the box at each end of the car, the air will be chilled,

and, becoming heavier than the rest of the air in the car, will pass down and out through the flue and the opening D' or either of them, and into the car; while the warm air will rise to the top of the car, pass through the opening D into the box, wherein it will in like manner be chilled, and pass out at the openings, maintaining a circulation in the car. Ordinarily, the greater part of the air will pass down and out of the flues at the end of the car, but it frequently happens, through accident or otherwise, that in loading the car freight will be so placed as to close or obstruct the opening at the end of the flue to such an extent as to interfere with the efficient circulation, and, with cars as heretofore constructed, there has been no way of remedying this defect. In the present car, however, if the air is prevented from escaping through the flue by means of the obstruction above referred to, it can and will readily escape through the openings D', either directly from the box or from the pan, thereby entering the car and maintaining a perfect circulation, and it is this control and direction of the currents of air that constitutes one of the most important features of my invention, as it is by this means that I insure absolute certainty of circulation of air throughout the car, however loaded, and thereby prevent any possibility of any part of such car becoming sufficiently warm to injure the goods being transported. Again, this method of construction renders it exceedingly easy to get at the interior of the ice box to clean it out, or for any other purpose, since a brush or other implement can be inserted through the opening D' when desired. As above stated, the bars B<sup>2</sup> are supported by a carling, which is in turn supported by posts located directly above the transom of the car, and this construction has the following advantage. As ordinarily constructed, these ice boxes are attached directly to the end of the car, or rest on the floor or are supported from the roof near the end of the car, and consequently, the weight of the ice tends to bend down and rack the car body; but, when constructed as herein shown, the greater portion of the weight will be supported directly above the transom, thereby preventing any such injury to the car. In case the car is being used without ice for any purpose, the passages E may be opened, thereby permitting the circulation of air from the outside through the car, in which case the pan F will act to receive and collect the cinders, dust, &c., which may enter through this opening, and discharge them downward through the flue, thereby preventing their escape into the car.

The advantages of the other features of my invention, such as the strengthening strips, the supplementary pan, &c. will be obvious from the above description, and need not be further detailed.

While I have described more or less precise

forms, I do not intend to limit myself thereto, but contemplate changes in form, proportions, and the substitution of equivalent members, as may be desirable or necessary.

5 I claim:—

1. In a refrigerator car, the combination of an ice box provided with air openings at points at or near the top and bottom of its innerside, a pan beneath such box, and a flue connecting with such box and opening at a point  
10 near the floor of the car, whereby a thorough circulation of air through the car is insured under all circumstances, substantially as described.

2. In a refrigerator car, an elevated ice box located at one end of the car and provided with an air entrance opening directly into the car at a point near its top, and with two air discharge openings, one of such openings being located at a point near the bottom of the car, and the other at a point near the bottom of the box, the latter opening admitting air to the car both above and beneath such bottom, substantially as described.

3. In a refrigerator car, the combination of an ice box located at the end of the car at a point near the roof, leaving storage space beneath such box, and having a solid front provided with an entrance opening near its top and a discharge opening near its bottom, a pan placed beneath the box, and a flue leading from such pan and opening at a point  
30 near the bottom of the car, substantially as described.

4. In a refrigerator car, an elevated ice box supported in great part by the roof timbers at a point directly above the car transom, whereby the greater part of the weight of such box and its contents is supported by the transom and racking of the car prevented, substantially as described.

5. In a refrigerator car, an elevated ice box provided with a slatted bottom, an opening in the roof of the car above such box, an inclined pan beneath the box, a flue leading  
45 downward from such pan and opening at a point near the bottom of the car, and openings in the solid front of such box at points respectively near the top and bottom thereof, substantially as described.

6. In a refrigerator car, the combination of an ice box provided with a slatted bottom, an inclined pan supported beneath such box, a flue leading downward from such pan and opening near the bottom of the car, an entrance opening into the ice box at a point  
50 near the car roof, and a second opening into the box also communicating with the pan, whereby a thorough circulation of air is insured, substantially as described.

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Witnesses:

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