(No Model.) 2 Sheets—Sheet 1.

N. L. BAUMGARDNER.

REFRIGERATOR CAR.

No. 303,793. Patented Aug. 19, 1884.

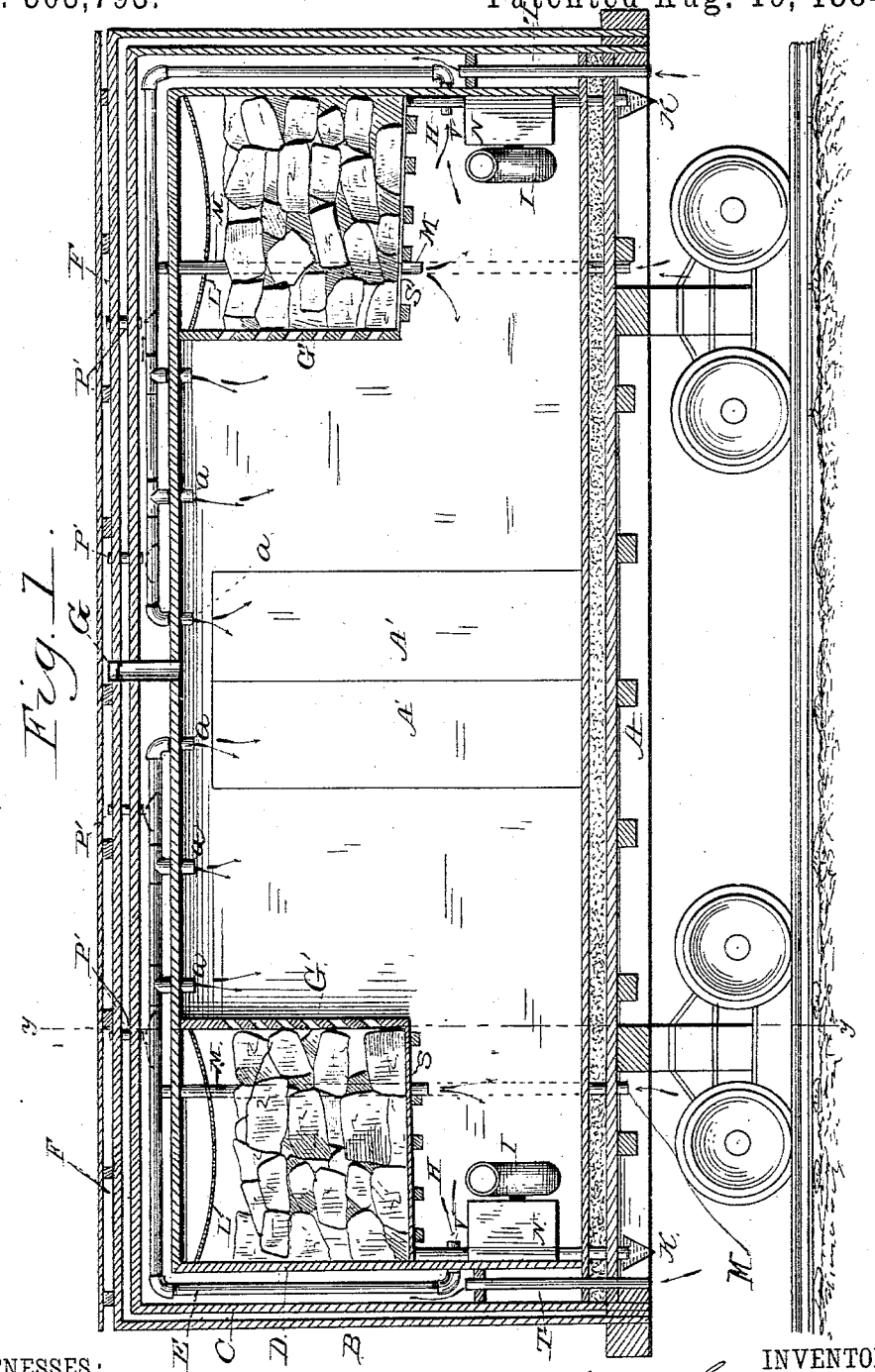

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

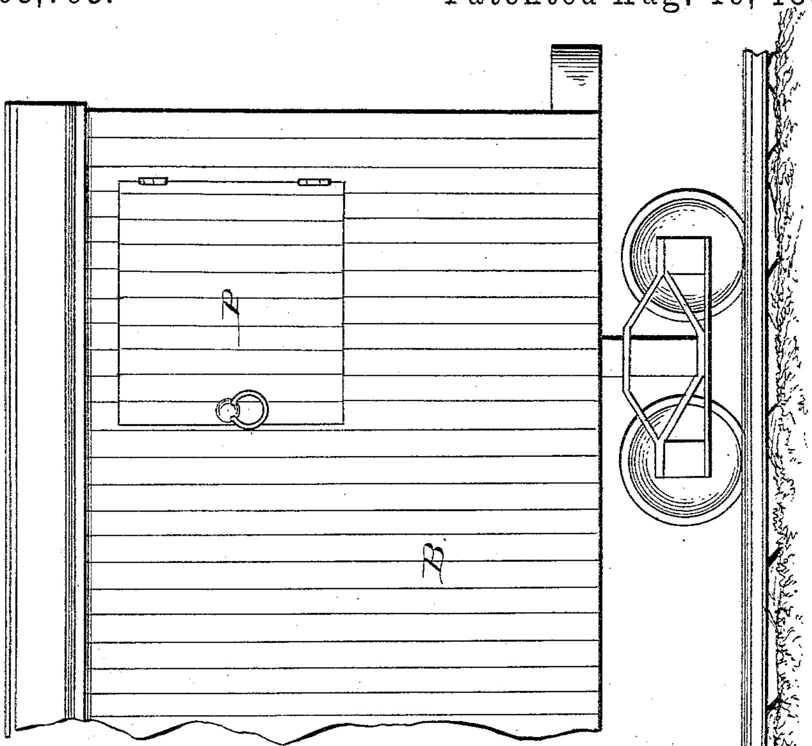
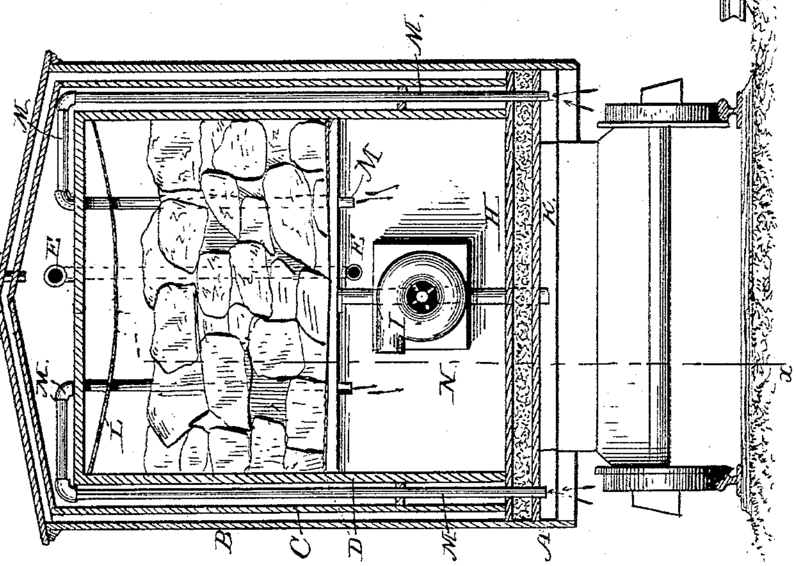


Fig. 2.



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UNITED STATES PATENT OFFICE.

NEWTON L. BAUMGARDNER, OF WOOSTER, OHIO.

REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 303,793, dated August 19, 1884.

Application filed June 6, 1884. (No model.)

To all whom it may concern:

Be it known that I, NEWTON L. BAUMGARDNER, of Wooster, in the county of Wayne and State of Ohio, have invented certain new and useful Improvements in Refrigerator-Cars; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to certain new and useful improvements in the construction of refrigerator-cars, whereby at a minimum expenditure of ice cool and fresh air is constantly supplied for the preservation of the perishable cargo during transit or while at a stoppage-point along the route.

To this end my invention consists in the novel features hereinafter set forth, and particularly specified in the claims.

Referring to the accompanying drawings, wherein like letters indicate like parts, Figure 1 is a longitudinal section of a car and part elevation embodying my invention upon the line *x x*, Fig. 2. Fig. 2 is a cross-section of the same on the line *y y*, Fig. 1. Fig. 3 is a side elevation of the car, partly broken away.

In the several figures, A represents the flooring of the car, composed of two layers of planking suitably mounted upon the truck-axles and separated by a non-conducting filling of appropriate material, preferably charcoal.

The outer body, B, of the car is mounted upon the lower planking or platform, forming an inclosed space. This space is subdivided into others by means of the inner partitions, C and D. No communication exists between the space included between the car-body and the partitions C and the external atmosphere or the car interior. The space referred to is therefore a non-conducting dead-air space. The car-body is surmounted by a three-sided channel, F, open at both ends. From this channel pipes *p' p'* enter the space between the walls C and D.

At opposite ends of the car interior are located the ice-receptacles, consisting of the perforated side G' and a solid flooring, S, drained by pipe H into a subjacent trough, K. These ice-boxes are accessible through side doors, as P, for the purpose of renewing from time to time their supply, as occasion requires. In their upper portions they are provided with the perforated partitions L. A pipe, G, extends upward from the interior of the car, opening into the passage-way or channel formed above the roof of the car, as shown. The pipe is provided with a flap-valve, opening upward, as shown. Through the bottom of the car extends upwardly the open-ended pipes M, passing through the space under the roof, where they are bent at right angles, running for a short distance parallel with the ceiling of the car, and then descending through the latter, and finally opening into the car interior, wherein the articles to be preserved are packed for shipment. The bends in the pipes are made by elbows and T's joining the straight sections, as is well understood. From the outer air short pipes T extend upward into the spaces between the frame-work or partitions C and D. Bent pipes, opening into the car interior at V, extend upward through the same space and again open into the car interior by the dependent branches *a a*. The car interior is accessible through the doors A' A'.

Immediately below the ice-boxes, or at any other convenient place, are arranged the fans I, preferably driven by clock-work within the boxes N. The perforated partitions in the upper portions of the ice-boxes are of metal, cloth, wire, or other material suitable for condensing the water contained in the air passing through them.

The parts being disposed as described, the operation of my invention is as follows: The car being put in motion, a quantity of air rushes through the channel formed by F and past the openings of the pipes *p' p'*. Consequently a vacuum is formed within said pipes, whereupon air is drawn through them from the space between the walls C and D. To supply the place of the air thus withdrawn, an additional quantity enters immediately through the pipes T, whereby a constant current is secured within the space and around the pipes E. In the same manner the flap-valves within the

pipes G communicate with the channel F, formed by the running-board and are caused to open and air to be withdrawn from the ice-boxes. In the same manner the flap-valve within the pipe G is caused to open and foul air to be withdrawn from the interior. Air accordingly enters the body of the car through the pipe M, that communicates at the bottom of the car with the outer atmosphere, and whose upper portion extends down through the body of ice and communicates with the car interior, this air being considerably cooled in its passage through the part of the pipe surrounded by the ice. By the escape of vitiated air through pipe G the fresh air entering to take its place induces a circulation through the pipes E. The continuous circulation through the space between the partitions C and D keeps the walls of the car interior free from moisture, and also serves to cool the air passing through the pipes E. The waste-pipe H is trapped, as shown in Fig. 1, so that the outflow of water will not be retarded by incoming air-currents. The dead-air space and charcoal-jacket prevent the car from being affected by sudden changes of temperature. In some instances, when desired, I supplement the automatic circulation already spoken of by a forced circulation produced by means of the fan I, operated by means of clock-work or other mechanism contained within the box N; or the fan-blade may be within the box and operated from the outside; or, when the car is at rest, the fan may be used with great advantage alone. It will be readily understood that the principles of construction herein described may be adapted to refrigerator-buildings with good results; hence I do not desire to confine myself to refrigerator-cars alone.

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

1. In a refrigerator-car, the combination, with the car body and partition forming a dead-air space, of the inner partition, D, the pipes T, entering the space between the partitions C and D, and the pipes p', opening from the said space into the channel F, whereby a circulation of air is maintained between the partitions C and D, insuring the walls of the car interior from moisture, substantially as described.

2. In a refrigerator-car, the combination, with the car interior containing the ice-receptacles, of the pipes M, communicating at one end with the outer air from the bottom of the car and opening into the car interior, and means, substantially as described, for inducing a draft through the ice-receptacles, whereby the temperature of the air passing through the said pipes into the car interior is still further lowered, substantially as described.

3. In a refrigerator-car, the combination, with the car interior, of the pipes E, with both ends thereof opening into the same and passing through the space between the partitions C and D, and means for causing a circulation through said pipes, whereby the body of air passing through the pipes is cooled by the current in the space named, substantially as described.

4. In a refrigerator-car, the combination, with the ice-receptacle, of the stand-pipes G, provided with flap-valves opening upward, and the longitudinal channel F under the running-board for directing a current of air past the ends of said pipes, whereby a draft is secured through them and the ice-chamber, substantially as described.

5. In a refrigerator-car, the combination, with the ice-receptacle, of the concave perforated condensing plates or cloths L across the top of the ice-receptacle, whereby the outgoing air is deprived of moisture, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

NEWTON L. BAUMGARDNER.

Witnesses:
O. E. DUFFY,
F. O. MCCLEARY.