(No Model.) 4 Sheets—Sheet 1.

A. J. BERG & F. A. ANDERSON.

REFRIGERATOR CAR.

No. 342,419. Patented May 25, 1886.

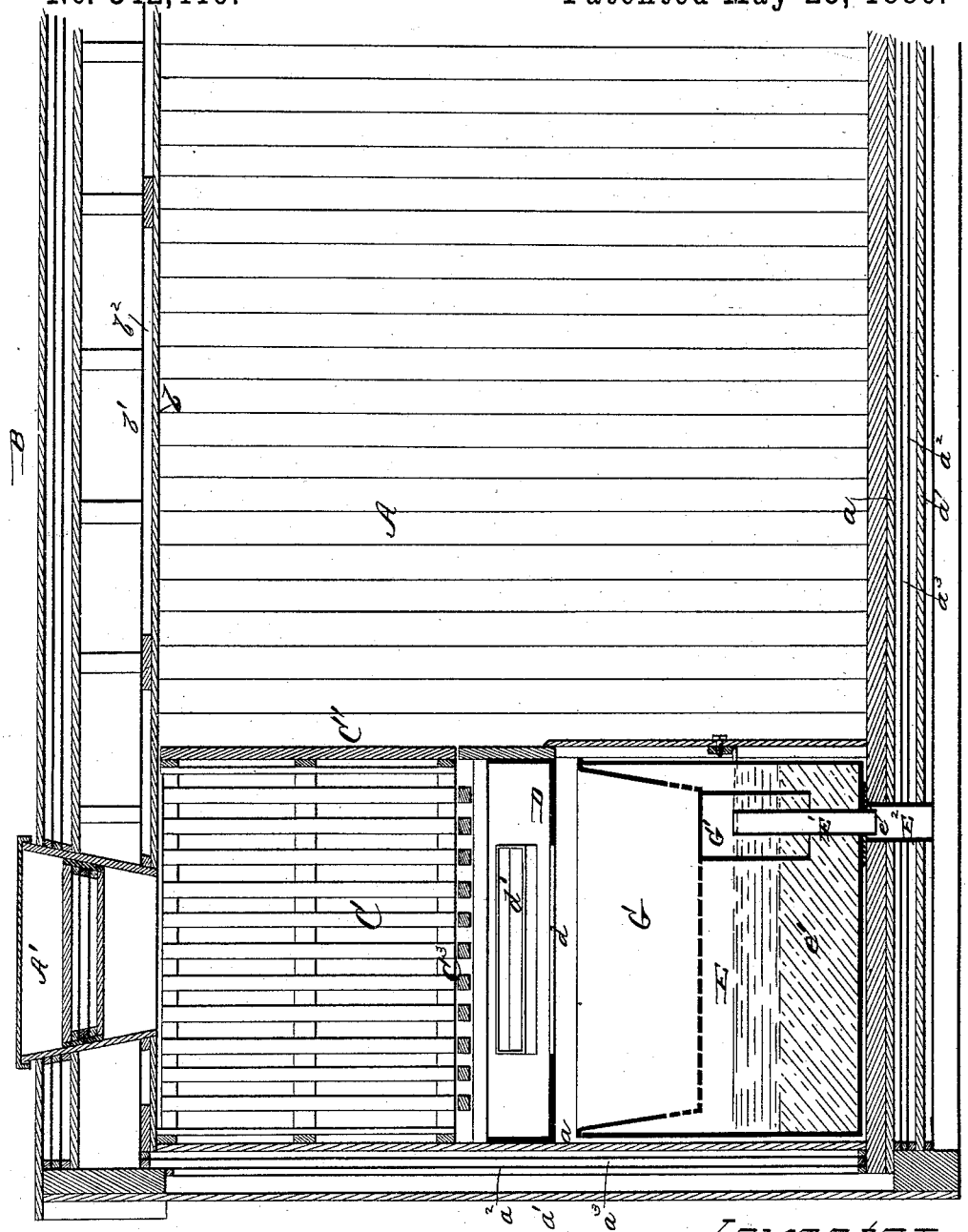

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Fig. 1.

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(No Model.) 4 Sheets—Sheet 2.

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REFRIGERATOR CAR.

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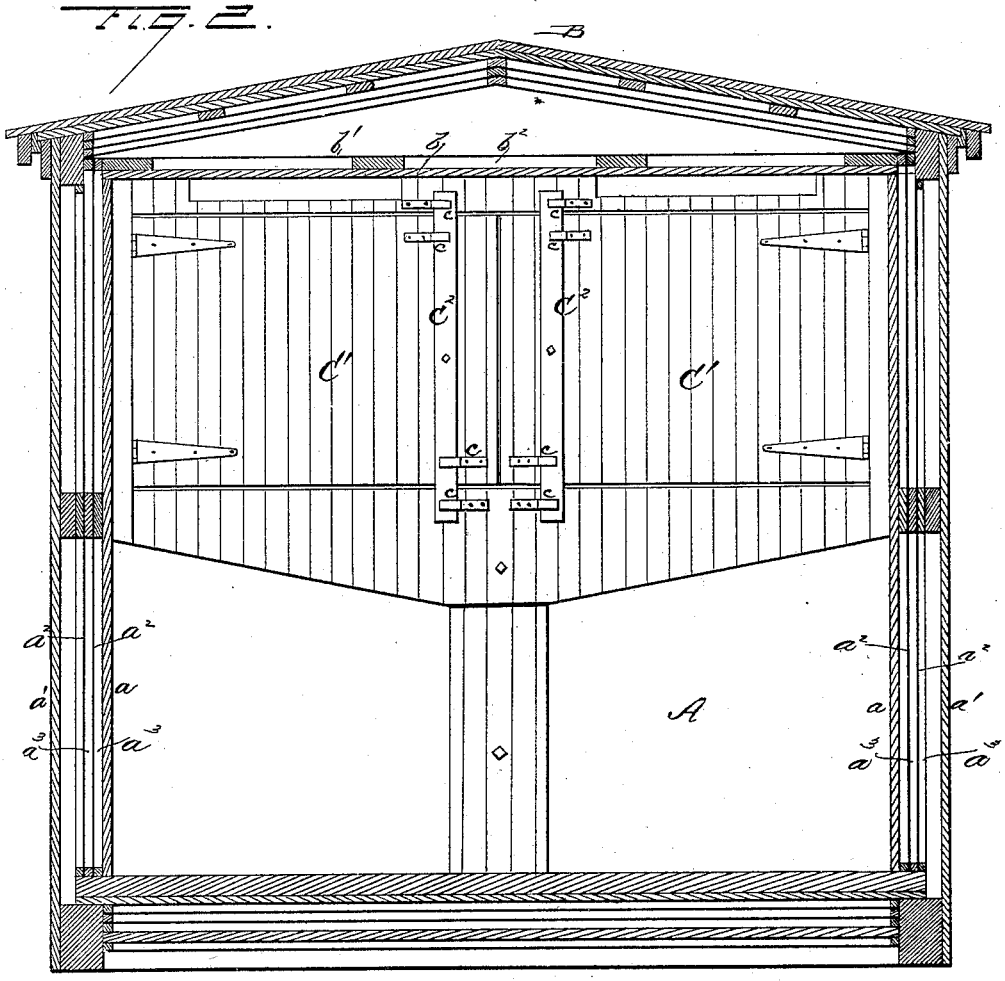
FIG. 2.



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(No Model.) 4 Sheets—Sheet 3.

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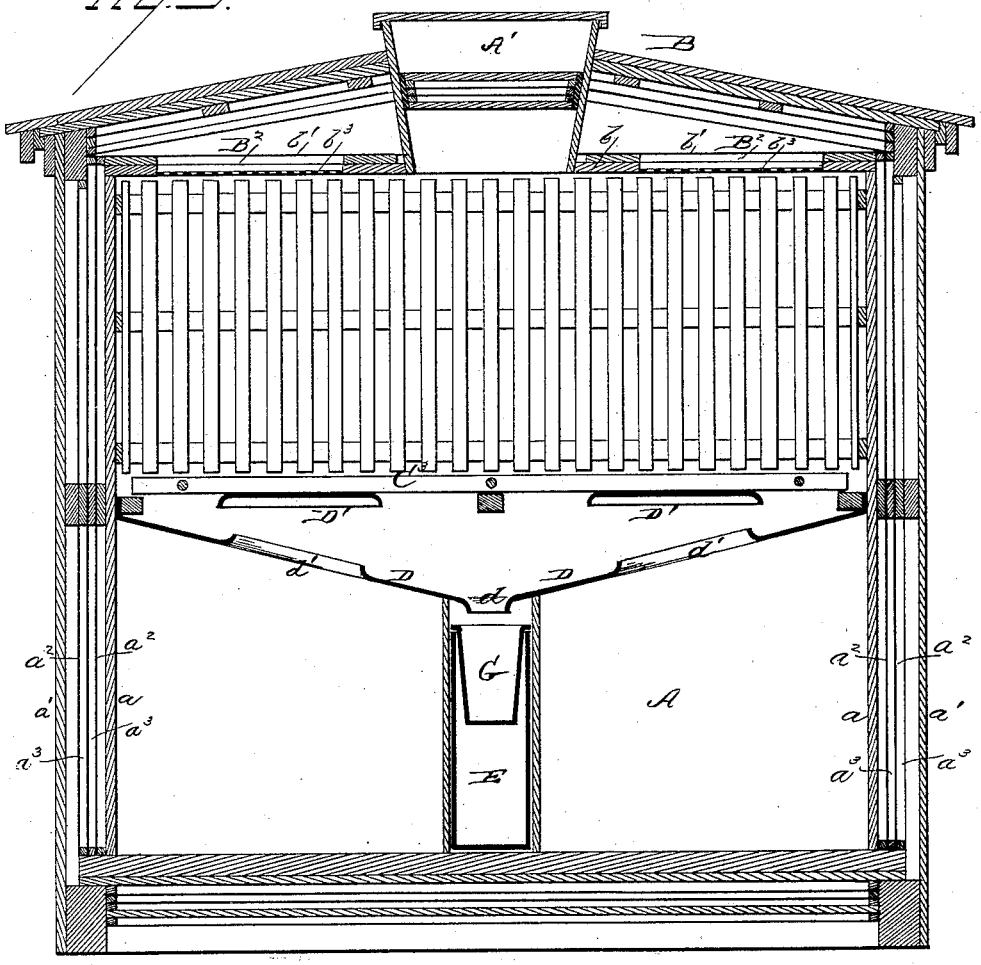
REFRIGERATOR CAR.

No. 342,419. Patented May 25, 1886.

FIG. 3.



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(No Model.) 4 Sheets—Sheet 4.

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REFRIGERATOR CAR.

No. 342,419. Patented May 25, 1886.

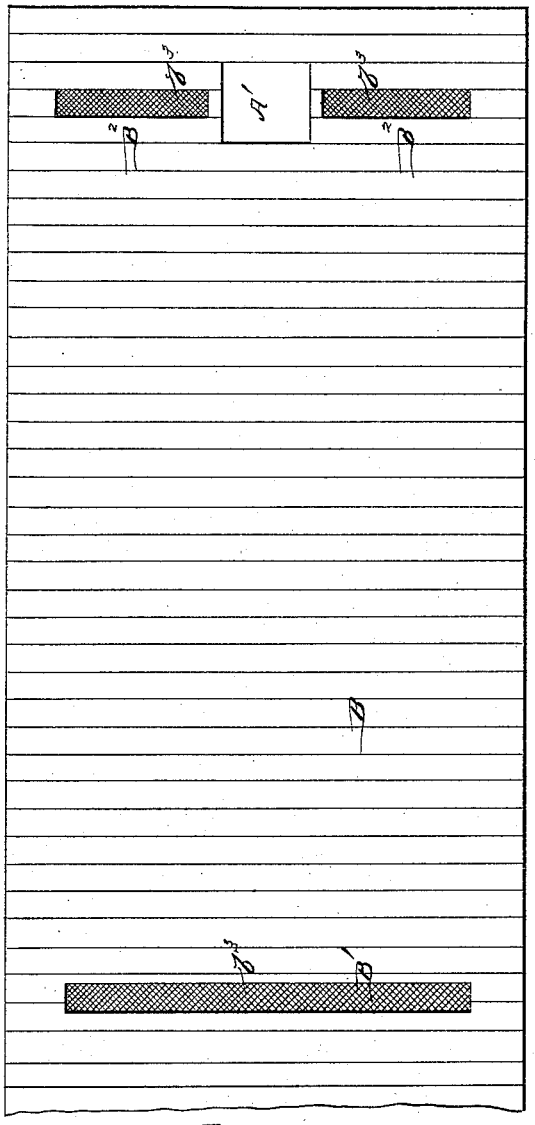

Fig. 4.

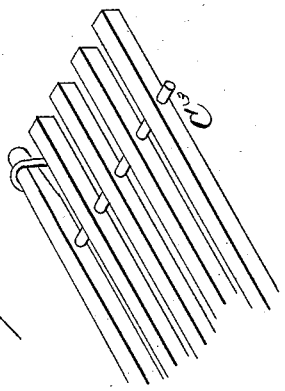

Fig. 5.

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UNITED STATES PATENT OFFICE.

AUGUST J. BERG AND FRANK A. ANDERSON, OF CHICAGO, ILLINOIS.

REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 342,419, dated May 25, 1886.

Application filed December 8, 1883. Serial No. 113,956. (No model.)

To all whom it may concern:

Be it known that we, AUGUST J. BERG and FRANK A. ANDERSON, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Refrigerator-Cars, of which the following is a specification, to wit:

This invention relates to an improvement in refrigerator-cars; and it consists in certain peculiarities of construction and arrangement of the same, substantially as will be hereinafter more fully described, and pointed out in the claims.

In order to enable others skilled in the art to which our invention appertains to avail themselves of the benefits of our invention, we will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of one end of our car. Fig. 2 is a transverse vertical section of the same, showing a face view of the ice-chamber in the end of the car. Fig. 3 is a similar view taken through the ice-chamber; and Fig. 4 is a bottom plan view of the roof or ceiling of the car, showing the openings for circulation of air; and Fig. 5 is a detail.

A represents the car-body, which is formed of an inner and an outer shell, *a a'*, between which are placed three layers of paper, a^2, having air-spaces a^3 between them, as fully shown in the drawings. These air-spaces are entirely closed, and air cannot enter or leave them at any point. The paper sections a^2 are of heavy manila paper, coated with shellac, to render it water-proof, and while each of them may be so coated it is thought sufficient to shellac the outer layers, leaving the inner one in its original state. The car-roof B is formed in a similar manner, having an inner flat shell, *b*, above which is a paper section, *b'*, and a dead-air space, b^2, as shown in Figs. 1, 2, and 3, which space is connected to the interior of the car through the shell *b* by an opening, B', in the center, and openings B^2 at each end, into the ice-chambers, all of which are covered by finely-perforated sheet metal or wire-gauze b^3, as seen in Fig. 4.

In each end of the car, beneath the roof, is formed an ice-chamber, C, having slatted interior surfaces, as shown, and having its front formed by doors C' C', opening outward into the interior of the car, for facilitating cleaning, loading with ice, and using the car for ordinary freight when not needed for perishable articles. These doors are secured when closed by means of bars C^2, pivoted to the doors and engaging with metal straps *c c*, or their equivalent, upon both the doors and their frames, as seen clearly in Fig. 2. The bottoms of the ice-chambers C are formed of racks C^3, which are hinged at one side, so as to be readily lifted for cleansing; and below these racks are arranged sheet-metal drip-plates D, inclined from the sides to the center of the car, as in Fig. 3, where they are formed with an opening, *d*, for the passage of the drippings. Each side of the drip-plates D is formed with an air-opening, *d'*, above which is a shield, D', secured to the hinged rack C^3, in order to prevent any drippings from the ice-chamber from passing through the air-openings to the main body of the car beneath.

Beneath the drip-opening *d*, in a suitable protecting frame or case, is placed the receptacle E, provided with an escape-pipe, E', which rises at some distance within the receptacle, and also projects below it into the waste-pipe E^2, through the bottom of the car, and is suitably packed by a rubber or leather disk, *e*, as seen in Fig. 1.

In the upper part of the water-receptacle E is suspended a perforated vessel or strainer, G, into which all of the drippings first pass, and which removes all the impurities liable to choke the waste-pipe. From the bottom of this sediment-basket projects a tube, G', which surrounds the upper portion of the overflow-pipe E'. The bottom of the receptacle E is filled with salt, as seen at *e'*, to a sufficient depth to inclose the lower end of the tube G', and the water passing through the sediment-basket into the receptacle E must filter through the layer of salt and rise within the tube G' before it can pass off through the overflow and waste pipes E' E^2. This arrangement keeps the escape-pipe always surrounded by a salt brine, and thus prevents any difficulty by freezing.

The roof of the car over the ice-chambers is provided with hatches A', for the passage of ice during transportation.

The operation of this car is as follows: Ice is packed into the chambers C through its doors C′, and the car then filled with meat or other perishable articles, as usual. The air in the ice-chambers descends through the openings *d′* in the drip-plates, and passing to the center of the car then rises and passes through the gauze screen into the space *b′* in the roof or ceiling, whence it passes again to the end of the car and back into the ice-chambers through the similar inlets on either side of the hatches, thus keeping up a constant circulation through the ice-chambers and freight. All drippings from the melting ice pass through the sediment-basket, where large impurities are removed, and thence into the vessel E, and, filtering through the layer of salt, pass off at the waste-pipe. The sides of the car, containing a number of dead-air spaces separated by a non-conducting material of waterproofed paper, fully protect the interior of the car from outside influences of either heat or cold. The front of the ice-chambers being composed of hinged doors it is not only very easy to pack the ice in them, but these doors are readily turned back against the sides of the car upon its return trip, and the ice-chambers may then be utilized with the main body of the car for the reception of ordinary freight. The receptacle E, as seen in the drawings, is inclosed by a casing having a removable front, and can therefore be easily removed and cleaned or the layer of salt renewed. The whole thus constitutes a waste-water receptacle, sediment-basket, salt-box, and trap, all separable for cleaning, and, being entirely inclosed and protected, it is not liable to injury either when the car is used for refrigerating purposes or for ordinary freight.

Any number of paper shells may be used as desired, and we do not desire to confine ourselves to shellac for rendering them waterproof, though it is preferred as cheaper than other materials suitable for the purpose.

We are aware that paper shells, *per se*, are not new in refrigerator-cars, but they have always been quickly ruined by the moisture which necessarily arises from such a car, and this we overcome by rendering them waterproof.

While we have shown a tube projecting from the sediment-basket to inclose the overflow-pipe, the same effect can be produced by securing a corresponding tube or partition within the receptacle in a similar position, the object being to force the water to pass through the layer of salt before it can escape.

The bulk-head is shown as composed of two doors opening against the sides of the car, but it may of course be made in one piece, and hinged to open up or down, if found desirable, the object being simply to aid in packing the ice and give more space for general freight.

It will be observed that the filling-openings for the ice-chambers pass entirely through the roof and ceiling, and that the gauze-covered air-openings from the air-passages in the roof to the ice-chambers are alongside of this ice-opening. This prevents a back current of air. In ordinary cases where the ice-openings simply pass through the roof when the cover is removed the warm air passes through the circulating-passage back to the center of the car, and is condensed on the meat, the moisture being of great injury. In this case, however, the warm outer air is compelled to pass on directly through the ice-chamber, where it is cooled before reaching the meat.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a refrigerator-car, the car-body A, provided with the ice-chambers C C at its ends, having their upper supply-openings passed entirely through the roof and ceiling, in combination with an air-passage open from end to end of the car between the roof and inner ceiling, connecting with the ice chambers on each side of the filling-openings, and provided with an air-inlet at the center of the ceiling covered with wire-gauze, and openings from the ice-chambers to the body of the car, substantially as and for the purpose set forth.

2. In a refrigerator car, a drip-receptacle provided with a waste-pipe projecting within it, and an inclosing tube or partition under which the water must pass to the waste, in combination with a layer of salt in which the lower end of the partition is immersed, whereby the drippings are forced to filter through the salt to reach the waste, substantially as and for the purpose set forth.

3. In a refrigerator-car, a waste-water receptacle provided with a suitable waste or overflow pipe, in combination with a perforated basket or strainer removably suspended therein, whereby all foreign substance is removed from the water and the waste-pipe kept clear of dirt, substantially as shown and described.

4. In a refrigerator-car, the waste-water receptacle E, provided with the overflow-pipe E′, and layer of salt e^2, in combination with the perforated sediment-basket G, having the tube G′, substantially as and for the purpose set forth.

5. In a refrigerator-car, the ice-chamber C, having a hinged bulk-head, C′, and a hinged ice-rack, C^3, provided with the shields D′, in combination with the inclined drip-plate D, formed with drip-opening *d* and air-openings *d′*, and the receptacle E, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

AUGUST J. BERG.
FRANK A. ANDERSON.

Witnesses:
W. C. McARTHUR,
CHAS. KRESSMANN.