(No Model.)

H. C. GOODELL.

REFRIGERATOR CAR.

No. 300,596. Patented June 17, 1884.

Fig. 1.

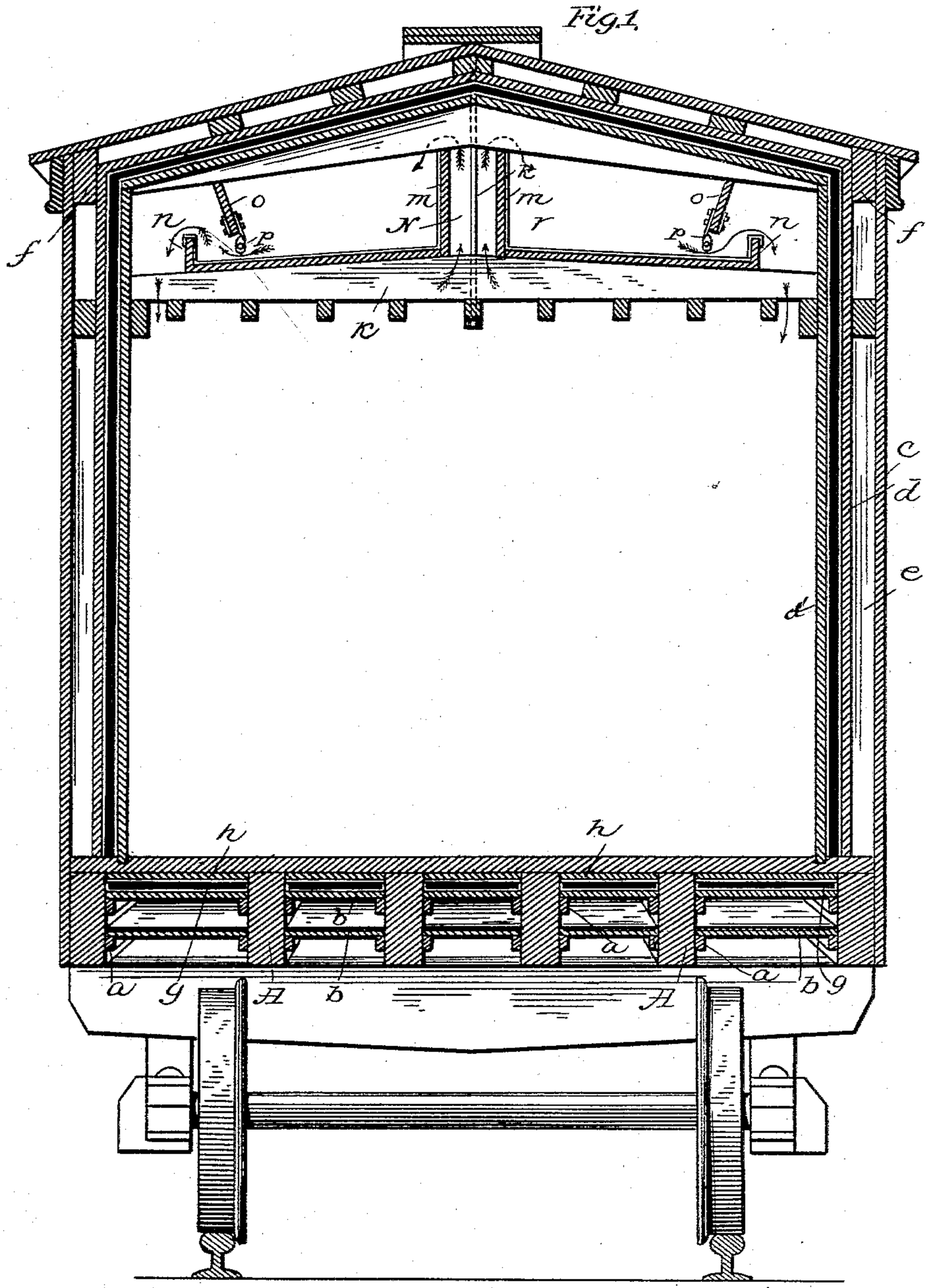
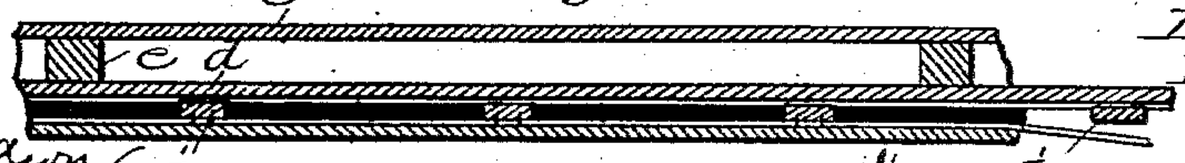


Fig. 2.



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HENRY CARR GOODELL, OF ATCHISON, KANSAS.

REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 300,596, dated June 17, 1884.

Application filed April 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. GOODELL, of Atchison, in the county of Atchison and State of Kansas, have invented a new and useful Improvement in Refrigerator-Cars; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to refrigerator-cars, and includes, first, an improved packing or non-conducting lining; and, second, an improved construction and arrangement of the ice-receptacles.

In refrigerator-cars, in respect to the non-conducting linings, it is desirable, first, that the material used therefor should be light; second, that it should occupy the least possible space consistent with the effectual exclusion of heat; and, third, that it should be such in quality that it will not settle under the jolting to which the car is subjected.

To meet these requirements my invention consists of a filling or lining for cars of lamp-black and mica or equivalent admixture, and means for retaining the lamp-black in place within the walls.

In respect to the refrigeration of the car, the points to be attained are, first, the holding of the ice compactly and in convenient position within the car; second, to expose as much as possible of refrigerating-surface to the air; third, to provide a suitable system of drainage; fourth, to provide the most efficient and active circulation of the air from the ice to the center of the car; and, fifth, to economize the space and provide the largest possible amount of room for suspending meats and the like.

In the accompanying drawings, I have represented, in Figure 1, a vertical cross-section of a car with my improved filling and refrigerating apparatus. Fig. 2 is a detail of a part of the wall of the car.

In general form the car is of ordinary construction. It is provided with sills A A, running longitudinally, which sills are provided with strips *a a*, fixed thereto to support the coverings and partitions *b b*. These form air-spaces in the bottom of the car below that containing the non-conducting filling. Air-spaces are also provided in the walls of the car by means of outer and inner walls, *c d*, which are formed of matched boards nailed to studding *e* and horizontal strips *f*. This air-space is continued by like construction on the top of the car, and is also extended across the ends.

At the bottom of the car, above the upper line of partitions *b*, is placed the filling of lamp-black. It rests, preferably, in shallow sheet-metal trays *g*, the flanges of which may be tacked to the sides of the sills. Instead of these trays, however, I may place the filling directly upon a cloth, which is laid upon the upper surface of the upper partitions, *b*, and retains the lamp-black, preventing any sifting through cracks and consequent loss of the filling. After the filling is in place I prefer to place cloth over it, and in order to fill the space left above the filling between it and the flooring of the car, I lay the pieces *h h* upon the cloth, which also adds to the pressure upon the filling and tends to prevent sifting. The board floor is then laid upon the whole, if constructed as described, or it may be laid directly upon the cloth or the lamp-black alone, as preferred.

In the walls of the car the non-conducting filling is laid against the inner wall, *d*, which may, if preferred, be covered with cloth or other suitable material. Before applying the filling, however, I nail to the inner wall vertical strips *i*, (shown in Fig. 2,) any suitable distance apart—say from one to two feet—and on the inside of these I tightly stretch cloth, taking care to make tight joints around the edges. The strips are preferably about one inch thick, or from one to two, according to the thickness which may be desired of the non-conducting filling.

I may apply the cloth filling to the car in the following manner: I tack on the cloth along the bottom, to the height of a number of inches and then nail a matched board of corresponding width upon the cotton, forming a wall, *d'*, and then fill in the lamp-black or other filling between the inner cloth and its backing and the wall *d*, and between the vertical strips. I then tack the cotton a few more inches and back it up with another board, and so on in this manner until the top is reached, and in this way I form a tight space for holding the lamp-black and prevent it from sifting out by the jolting of the car through cracks in the original structure of the wood-work, or formed during use. I do not,

however, confine myself to this particular mode of putting up the lining.

Instead of cloth, I may use any suitable kind of paper, but prefer cloth.

The lamp-black forms a most efficient non-conducting filling, is extremely light, and by reason of its lightness and slight elasticity will resist any tendency to pack from jolting. I may, however, increase the elasticity and lessen the cost of the packing by mixing with the lamp-black pulverized mica, which is extremely well fitted for the purpose, being highly elastic and also non-conducting. I mix it thoroughly with the lamp-black and pack the mixture in the manner heretofore described. Short fiber may be used instead of the mica scales; but the latter is a cheap and very efficient ingredient. A packing one inch in thickness of the lamp-black or the mixture described, in connection with the dead-air space outside of this packing, will afford a sufficiently high resistance for ordinary purposes.

The doors of the car, under the plan described, are preferably hinged. They may be constructed in the same manner as the walls.

The described construction of the car in respect to the lining and the nature of the non-conducting material used all combine to give the necessary lightness and at the same time occupy a minimum of space. This combination of lightness and compactness is favorable for the location of the ice-box in the upper part of the car.

For certain and positive circulation, the location of the ice-box in the top of the car is highly advantageous, and where the non-conducting filling is itself light and occupies but little space, it lessens the objection to the location of the somewhat heavy and bulky ice-box in the top of the car. In order to adapt the box to this location, I have constructed it in the form shown in the figure. In this figure the bottom of the ice-box rests upon a joist, K, arranged across the car and supported as hereinafter described. The floor of the ice-box is preferably sloped downward slightly from the center to the sides, for the purpose of causing the ready outflow of drainage, and also in order that the central opening for the ascent of the warmer air may be higher than the openings on the side for the downflow. This central opening (shown in the figure at *n*) extends, preferably, the entire length of the car, and is formed by two walls, *m m*, which divide the ice-box into two compartments and leave the aforesaid central opening for the admission of the warm air, which rises from the car, and, passing through the space between the walls *m m*, flows over these walls and enters the ice-box on each side. The sides of these compartments next to the wall of the car are formed by the walls *n n* lower than the central walls, but of sufficient height to arrest the flow of the drip from the ice and to turn it toward any suitable escape-pipe. The rest of the wall is formed by the depending flanges *o o*, set inclined, as shown in the figure, and projecting down to or a little below the level of the upper edge of the walls *n n*. These flanges hold the ice in position, but allow the circulation of the air under the flanges and over the walls *n*, and the circulation will tend in this direction because of the outward inclination of the floors of the compartments.

In order to prevent small pieces of ice from passing under the flanges *o o*, I form prongs *p* out of strap-iron, which are bolted, as shown, to the lower edge of the flanges *o*, and twisted quarter-way round in order to turn the edge in the direction of the outflow and to interfere as little as possible with the current of air. Slender rods of iron may then be placed through holes in these prongs to form a grating against which the ice may rest, but through which it cannot pass. The space outside of the walls *n* is not covered, and there is a free passage for the air down through between the joists K into the lower part of the car. These openings extend, preferably, the entire length of the car. The joists K rest on scantlings bolted to the wall of the car and receive further support in the center from a row of rods, *k*, extending from the roof.

At suitable points along the roof of the car trap-doors are provided to place the ice within the refrigerator, and at such points the walls *m m* (if the doors be in the center) are cut away to allow the ice to be easily and readily admitted.

The construction described converts perfectly the larger part of the upper space of the car into room for the ice-box, and with so large an area of bottom the box need not be more than fifteen or twenty inches deep. I prefer to make the openings on the sides about six inches wide, but do not confine myself to these dimensions.

It will be evident that this plan of a refrigerator is also adapted to be used in other situations besides a car, and may be used with equally good results in any vessel, storage-house, or similar place desired. I do not limit myself in its application to a car.

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

1. The combination, in a refrigerator-car, of the outer wall, *c*, intermediate wall, *d*, forming an air-chamber, the inner walls of matched boards, suitable linings for said inner wall and wall *d*, and non-conducting filling between said walls, substantially as described.

2. The combination, with the retaining-walls of a car, of a filling of lamp-black mixed with mica, substantially as described.

3. In a refrigerator-car, an ice-box separated into longitudinal compartments by walls *n n*, with the intermediate air-passage, and with floors inclined downward from the center to the sides, as described.

4. In a refrigerator-car, an ice-box having its

bottom sloping downward from center to the sides, the central air-passage, and the outer walls, *n n*, and depending flanges *o o*.

5. In combination with the box having downwardly-sloping floors from the center to the sides, the walls *r*, and the depending flanges *o o*, and the prongs supporting the rods, substantially as described.

6. The combination, in a refrigerator-car, of double walls with suitable spaces between, a cloth or equivalent lining for said walls, and the filling of lamp-black, or mixture of lamp-black with other material, substantially as described.

7. In a refrigerator-car, an ice-box located in the top of the car, said ice-box being divided by two walls, *m m*, forming an air-passage which opens into the car below and the box above, said box having also openings in its outer sides for the downflow of the cooled air, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY CARR GOODELL.

Witnesses:

GEORGE H. LAYNG,

W. B. RICHARDS.