

(No Model.)

3 Sheets—Sheet 1.

S. HUGHES.
Refrigerator Car.

No. 229,611

Patented July 6, 1880.

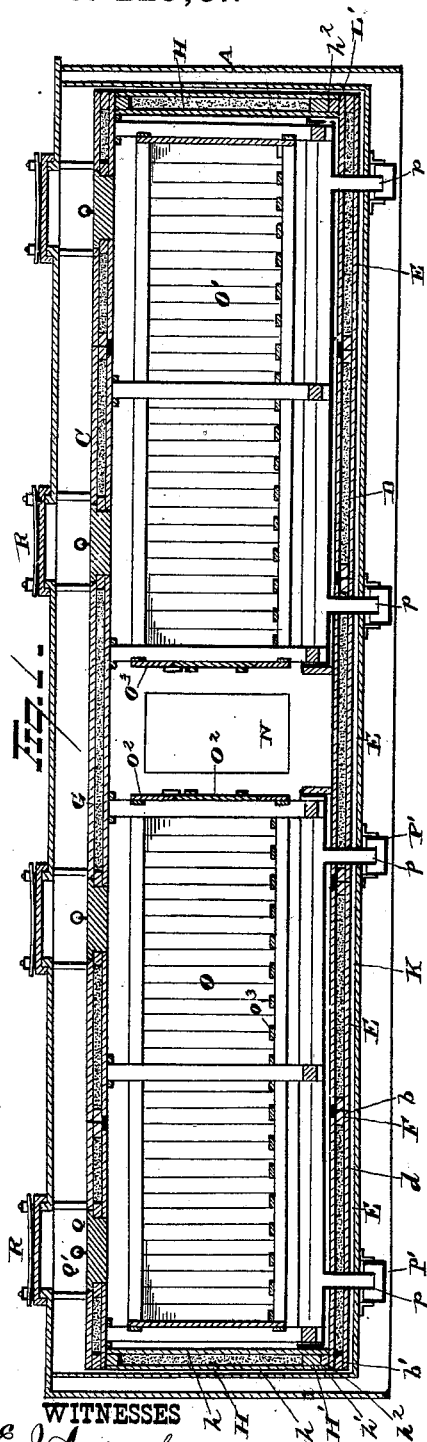
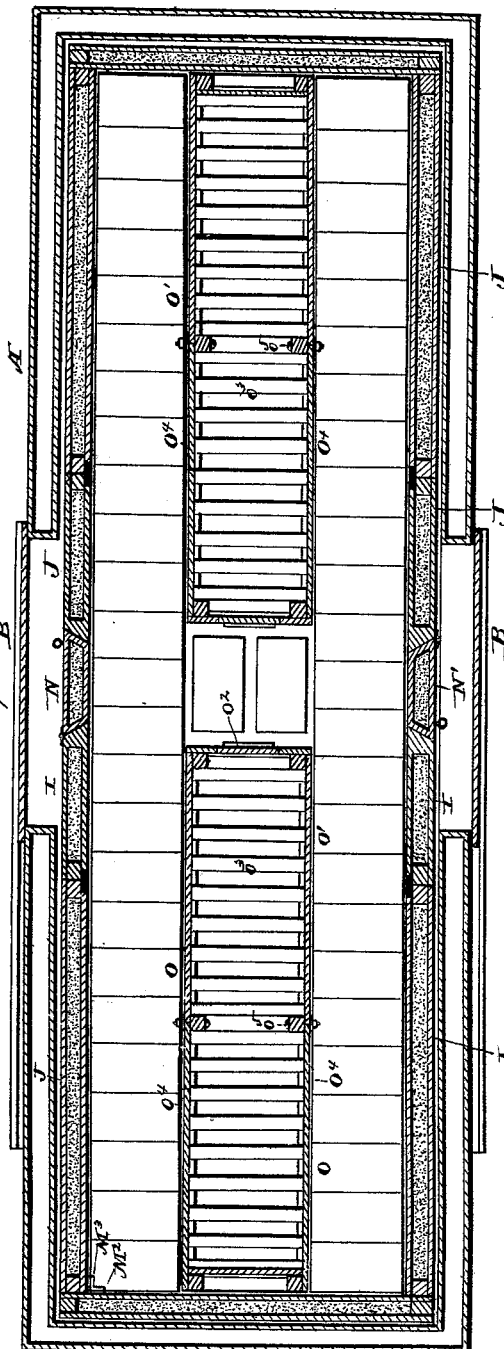


Fig. 1.



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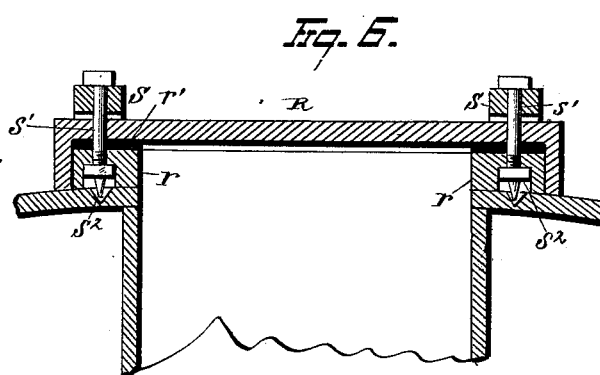
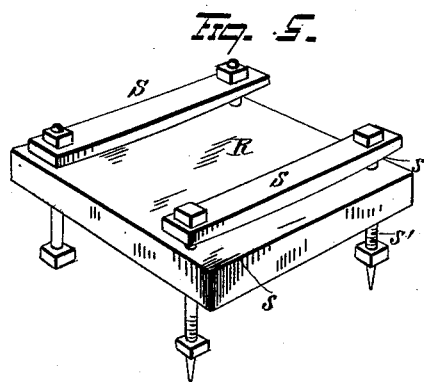
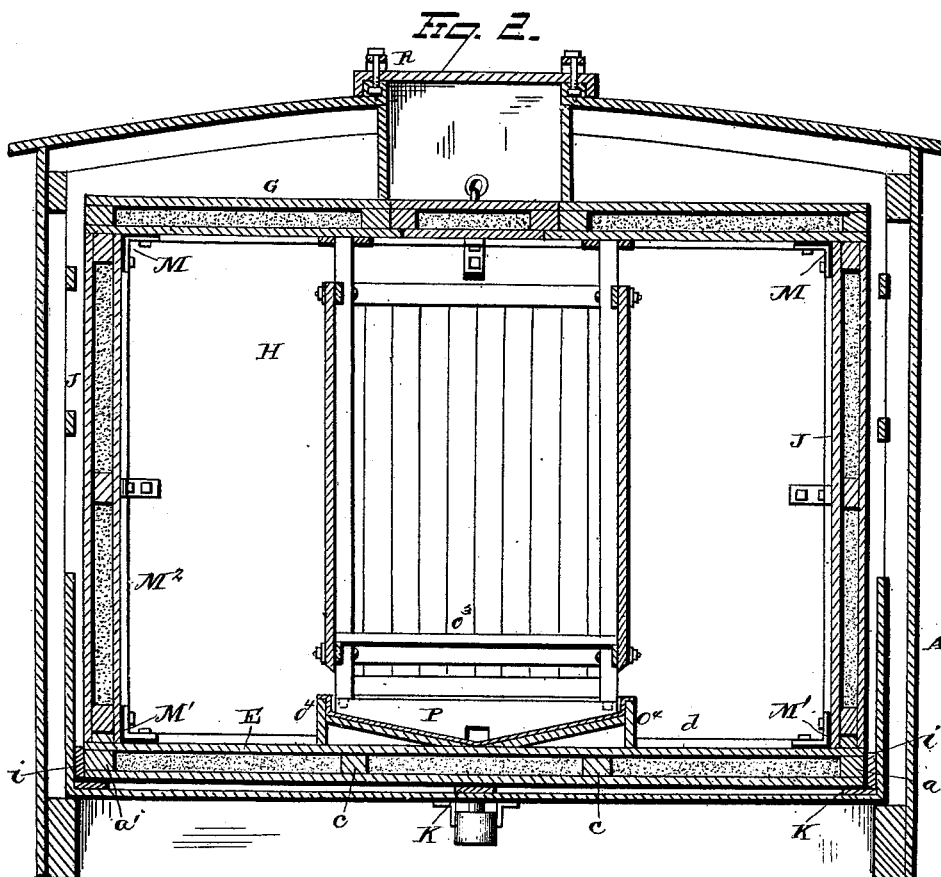
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3 Sheets—Sheet 2.

S. HUGHES.
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No. 229,611.

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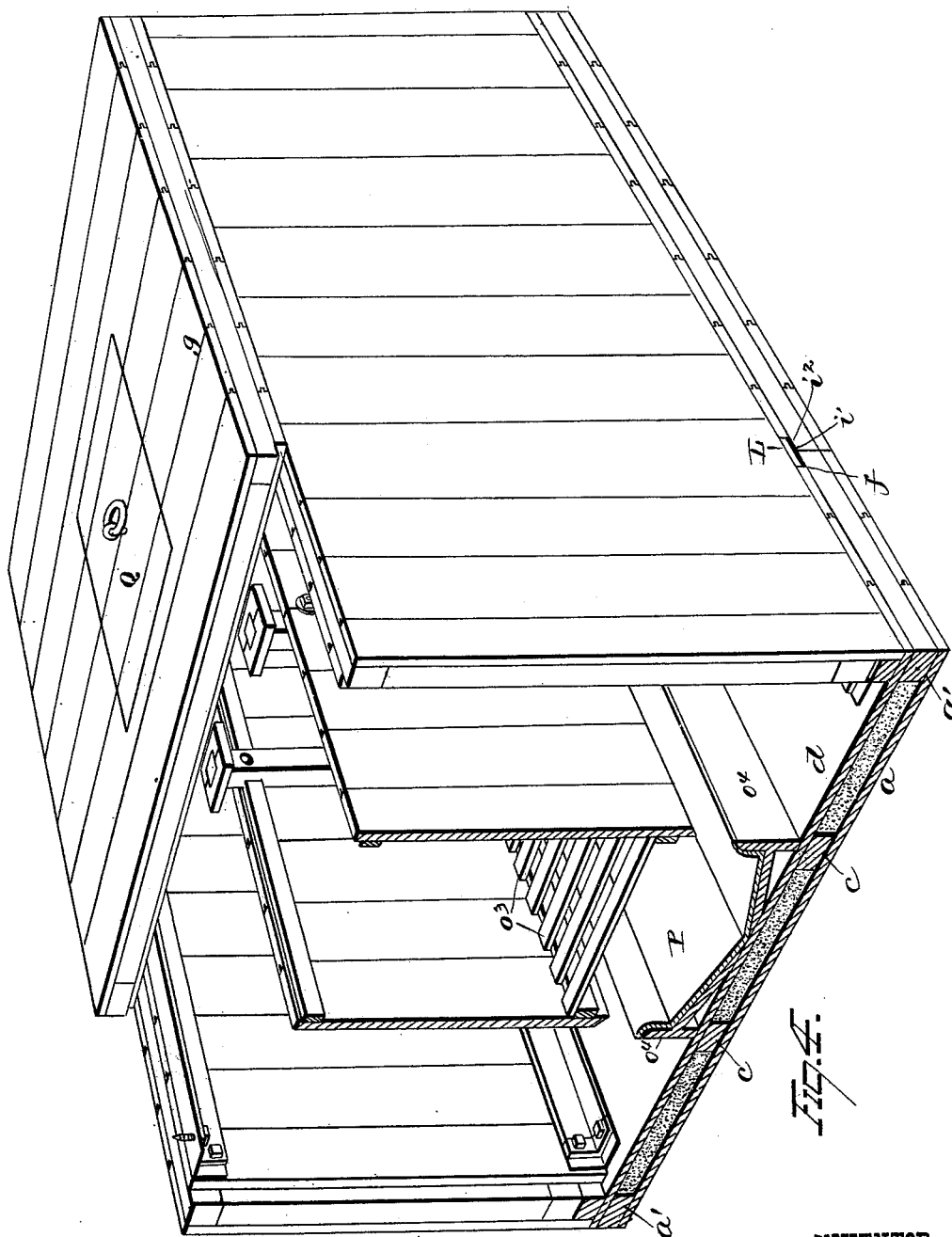
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3 Sheets—Sheet 3.

S. HUGHES.
Refrigerator Car.

No. 229,611.

Patented July 6, 1880.



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UNITED STATES PATENT OFFICE.

SAMUEL HUGHES, OF CHARLESTON, SOUTH CAROLINA.

REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 229,611, dated July 6, 1880.

Application filed April 14, 1880. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL HUGHES, of Charleston, in the county of Charleston and State of South Carolina, have invented certain new and useful Improvements in Sectional Refrigerators for Railroad-Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in sectional refrigerators for railroad-cars, the object being to provide a refrigerator made of several sections, which may be readily set up and secured together within an ordinary box freight-car for use in the transportation of fruit and provisions, the sections to be so constructed and arranged that ample room for storage will be provided on opposite sides of the ice-receptacles, and the ice-receptacles located so as to insure continual ascending currents of cold air on opposite sides thereof throughout the length of the car, one of the prime objects of the invention being to provide a sectional refrigerator which may be readily set up within a car and be removed therefrom and stored in small compass for further use, thus allowing the car to be employed for the transportation of ordinary freight.

With these ends in view, my invention consists in certain details of construction and combination of parts, as will hereinafter be explained, and set forth in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of a freight-car having one of my improved sectional refrigerators placed therein. Fig. 2 is a vertical transverse section of the same. Fig. 3 is a horizontal section, showing the arrangement of the crates of berries in the refrigerator. Fig. 4 is a view, in perspective and partly in section, of one end of the refrigerator, showing one section of the sides and one full section and part of another section of the bottom and one section of the top. Fig. 5 is a view, in perspective, of one of the doors on top of the car through which ice is inserted to the ice-receptacle. Fig. 6 is a transverse section of the door secured in place.

A represents an ordinary box freight-car, provided on opposite sides with the ordinary sliding doors B B.

Within the car is placed the sectional refrigerator C, which is constructed as follows:

D represents the bottom of the refrigerator, and is composed of any desired number of sections, E, each of which must be of such size as to be readily inserted through one of the sliding doors B. Each section E is constructed of the frame F, consisting of the side pieces, *a a'*, and end pieces, *b b'*, the latter being connected by one or more cross-bars, *c*. On opposite sides of the frame F are secured the boards *d*, which are laid flush with the sides and end of the frame on the lower side thereof, while on its upper side the boards are laid so as to leave a space, *f*, on the upper sides of the end pieces, *b b'*, for a purpose hereinafter explained.

Top G of the refrigerator is composed of sections *g*, corresponding in size, and of the same construction as sections E of the bottom, with the exception that the space *f* on opposite ends of each section is formed on the under sides of the section instead of on their upper sides.

H are the ends of the refrigerator, and are each formed of a frame, H', having boards *h* fastened to opposite sides thereof. Boards *h* on opposite sides of the frame H' extend a sufficient distance below the frame-piece *h'* to form a groove, *h²*.

The sides I of the refrigerator are formed of the sections J, which are of greater length than the sections E of the bottom, as they are of less height than the width of the bottom sections, and hence longer sections may be inserted through the side doors of the car. Each section is formed of frame-pieces, the same as the bottom sections, and have their joints sealed by paper strips and laths in the same manner. The several sections composing the top, bottom, ends, and sides of the refrigerator have their interior spaces filled with any suitable non-conducting material, which material is placed therein and confined in place by the boards on opposite sides of each section. In setting up the refrigerator within the car strips K are nailed to the bottom of the car, in order to provide an even support for the bottom D. Sections E, composing the bottom of the re-

refrigerator, are first inserted through the doors B and arranged on the floor of the car, wedges *i* being driven between the sides of the car and opposite sides of the bottom sections to prevent any lateral displacement of the latter. The sections E are placed so that their ends abut against each other, the spaces *f* on each end forming a groove, *i'*, at each joint between the bottom section. Within each groove *i'* a strip, *i''*, of paper is pasted over the joint, and over the paper strip is nailed a lath or strip of wood, L, thereby forming a flush and even surface throughout the entire bottom of the refrigerator, and sealing the several joints in the bottom to make the latter air-tight.

To the outer ends of the end sections of the bottom of the refrigerator are secured the strips L', over which are placed the grooved ends *h*² of the removable ends H, thereby forming a secure joint and retaining their ends against displacement. Sections J, forming the sides, are next inserted in place, the end side sections abutting against the ends H and secured thereto by angle-irons M, and also to the bottom sections by angle-irons M'. The joints between the sides and ends are sealed by strips of paper pasted over the joint and protected by laths M² M³ nailed over the paper. Top sections, *g*, are then inserted and secured in place by angle-irons, fastening the top sections to the sides and ends. Thus it will be observed, that the top, bottom, sides, and ends of the refrigerator are each constructed complete in themselves, ready for being inserted and set up within an ordinary box-car in a short space of time, and when secured in place form a perfectly air-tight receptacle.

The side sections are provided with doors N N', which are located opposite the main doors B B of the car, the doors N N' being formed with beveled edges, as in ordinary refrigerators.

Within the refrigerator are placed two ice-receptacles, O O', which are located on opposite sides of the central passage-way, O², to allow of sufficient space for the introduction of crates or boxes.

Ice-receptacles O O' are each constructed as follows: O² O³ are the ends, provided with doors o², and O⁴ the sides, the latter being formed of two sections, o o', secured at their central portions to the posts o⁵. Each receptacle is provided with a grated bottom, o³, upon which the ice is supported, the drip falling upon the sheet-metal gutter P, the width of which slightly exceeds that of the ice box or receptacle. The sheet-metal gutter is secured at its sides to the longitudinal strips of wood o⁴, and is provided at opposite ends with the escape-pipes *p*, which extend down through the bottom of the car and enter the cups or pans P', which latter being partially filled with water, the latter serves as a seal to the open ends of the drip-pipes and prevents warm air and dust from entering the refrigerator.

The top of the refrigerator is provided with doors Q, preferably four in number, to enable

the ice to be readily disposed through the length of the ice-receptacles.

The adjacent ends of the ice-receptacles may be filled with ice through the end doors, o², thus rendering it unnecessary to insert all of the ice for the ice-receptacles through the car-roof.

Each door is furnished with a ring, Q', to enable it to be readily lifted and removed through the doors R formed in the car-roof.

Around the door-openings in the car-roof I place a combing, *r*, upon which is placed a cover or door, R, which is furnished around its lower edge with an elastic packing, *r'*, and on its upper side with the two transverse bars S, of wood or metal, which are beveled on their opposite ends and lower sides, as at *s s*. Through the opposite ends of bars S are inserted the bolts S', the latter engaging in nuts S², let into the car-frame or other suitable fixed object.

The curve is quickly secured in place by screwing down the four bolts connected therewith, and the tension of the bars S serves to prevent the ends of the cover from buckling and to retain them firmly against their seats.

The ice-receptacles are filled with ice by removing the doors or covers in the car-roof, then pulling the doors in the top of the refrigerator upwardly and out of the car. When the proper quantity of ice has been placed into the ice-receptacles the covers of the refrigerator are replaced, and the doors R are quickly and firmly secured in place by turning down the bolts S'. Crates of fruit may then be packed on opposite sides of the ice-receptacles nearly to the top of the refrigerator and between the adjacent ends of the ice-receptacle. The refrigerator-door and car-door are then closed and locked, the refrigerator then being practically air-tight.

As the air comes in contact with the ice in the ice-receptacles it becomes cooled and of greater density than the surrounding air, and falls through the grated bottom of the ice-receptacles and flows upwardly on opposite sides of the ice-receptacle, thereby cooling the fruit. A constant circulation of the air is thus maintained in the refrigerator, the air flowing downwardly through the ice-box, and then laterally toward the opposite sides of the refrigerator, and upward through the crates and in contact with the fruit, and then inwardly and down through the ice-receptacle again. As the ice melts the waste water drips into the metal gutter and escapes through the drip-pipes, the latter being water-sealed, as hereinbefore explained, to prevent the admission of any outer air.

My improved construction of refrigerator is most economical in use, as but a comparatively small quantity of ice will suffice to preserve the contents of the car throughout a long journey. It is especially adapted for use in the transportation of fruits from the South to the North in the early spring. For such use it is found unprofitable to provide refrigerator-cars,

as they must remain idle for a greater portion of the year, and hence necessitate the investment of a large amount of capital in rolling-stock which can only be used for a short space of time in the year. By employing my improved sectional refrigerators but a small amount of capital is necessary to convert an ordinary box-car into an excellent refrigerator-car, especially adapted for carrying fruits, and when the season is ended the refrigerator may be readily removed and stored for use again, while the cars may be employed during the remaining portion of the year for the transportation of ordinary freight.

I am aware that refrigerator-cars have been constructed by securing to the top, sides, ends, and bottom of a car a sectional lining of paper, which may be removed to convert the car into an ordinary freight-car, and that cars of such construction have been provided with an ice-rack which extends transversely across the car between the central side doors, and hence I would have it understood that I make no claim to such construction and arrangement of parts.

Cars constructed as above set forth were intended and adapted for transporting meats, but could not be used successfully in the transportation of fruits and berries.

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

1. In a sectional refrigerator for cars, the combination, with end sections, sectional top, sides, and bottom, of ice-receptacles extending from opposite ends of the car to the central doorways, substantially as set forth.

2. In a sectional refrigerator for cars, the

combination, with end sections, sectional top, sides, and bottom, of ice-receptacles extending from opposite ends of the car to the central doorways, said ice-receptacles constructed with open tops, closed sides and ends, and grated bottoms, and supported above the sectional bottom, substantially as set forth.

3. In a sectional refrigerator for cars, the combination, with end sections, sectional top, sides, and bottom, of ice-receptacles extending from opposite ends of the car to the central doorways, and metal-lined gutters located beneath said ice-receptacles, and drip-pipes extending through the car-bottom, substantially as set forth.

4. In a sectional refrigerator for cars, the combination, with end sections, sectional top, sides, and bottom, of ice-receptacles extending from opposite ends of the car to the central doorways, and doors in the sectional top for the insertion of ice in the ice-receptacle, substantially as set forth.

5. The combination, with a sectional refrigerator provided with doors in the top for the insertion of ice, of removable doors secured to the car-roof, each door being provided with two transverse bars having yielding ends, and bolts which are inserted through said yielding ends and engage in stationary nuts let into the car-roof, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 10th day of April, 1880.

SAML. HUGHES.

Witnesses:

CHARLES P. WEBSTER,
F. O. MCCLEARY.