

No. 612,715.

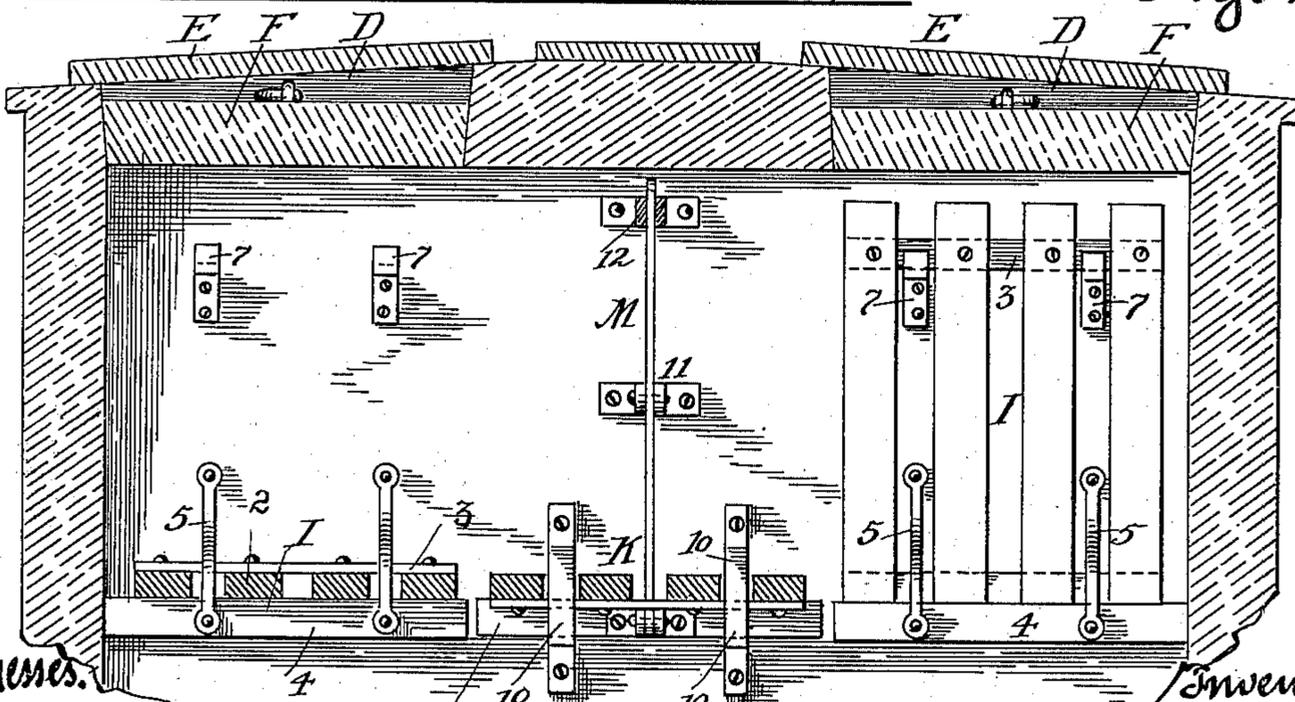
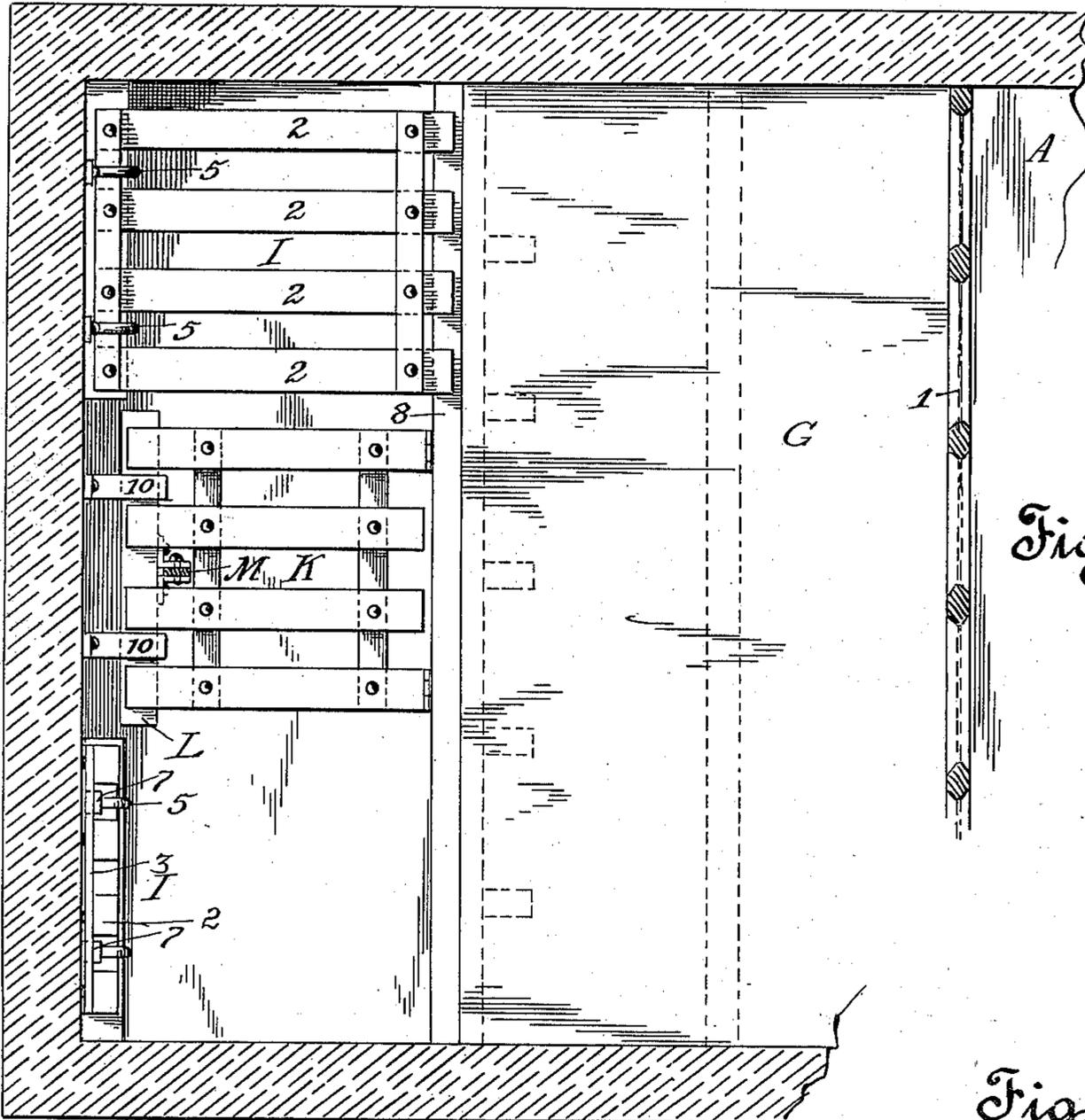
Patented Oct. 18, 1898.

E. T. EARL.
REFRIGERATOR CAR.

(Application filed Sept. 21, 1897.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

EDWIN T. EARL, OF OAKLAND, CALIFORNIA.

REFRIGERATOR-CAR.

SPECIFICATION forming part of Letters Patent No. 612,715, dated October 18, 1898.

Application filed September 21, 1897. Serial No. 652,464. (No model.)

To all whom it may concern:

Be it known that I, EDWIN T. EARL, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, 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 thereof.

My invention relates to refrigerator-cars, and more particularly to the ice-tanks with which such cars are provided.

The general style or type of car and tank to which my invention is especially applicable is described and shown in Letters Patent granted to me June 1, 1897, and numbered 583,794. In that patent I showed a car having an ice-tank at the end which extended entirely across the car and was provided with ice-holes in the roof for the purpose of filling the tank, and with a floor and also with an intermediate or supplementary floor movable so as to lie across the tank and thus diminish its size, or to lie against the wall of the tank, so that the latter should have its full ice-holding capacity. I also showed in that patent a preferred construction of the supplementary floor by which it was made in two parts independently movable in order to facilitate the discharge of ice from both parts of the supplementary floor into the lower part of the tank previous to opening the tank to its full capacity.

Since the ice-tank extends the whole width of the car, some inconvenience may result from employing a two-part supplementary bottom on account of the width of the separate parts. I prefer to raise the two sections of the bottom when opening the tank to full capacity in order to avoid interference with the ice discharged from them, as might take place when such a wide section is dropped, and in this case it is necessary to push all the ice from one section upon the other, then raise the freed section, and then discharge all the ice of both sections through the opening thus formed. This involves two handlings of a part of the ice. In addition the width and weight of two sections make them inconvenient in handling. My present improvements are designed to obviate these defects and to enable the ice to be more quickly discharged into the bottom of the tank and the supple-

mentary floor to be handled with more facility. I find that by making the supplementary floor of a greater number of sections and relatively smaller I can accomplish these desirable results. I have also devised special means for supporting and for moving the sections, all of which will be fully hereinafter described.

My invention also relates to improvements in the construction of the ice-tanks of refrigerator-cars and in the circulation of air within such cars.

In the accompanying drawings, Figure 1 is a vertical longitudinal section of part of a car, showing the ice-tank at one end and showing also one of the side sections of the supplementary bottom. Fig. 2 is a similar section showing in full lines the discharging-section of such bottom in position across the tank and in dotted lines the same section when folded against the wall of the ice-tank. Fig. 3 is a horizontal longitudinal section of the same, showing a plan view of the supplementary bottom. Fig. 4 is a vertical cross-section through the ice-tank.

A represents a refrigerator-car having at the end the ice-tank B, which is a compartment extending across the end of the car and provided with a bottom C. In the roof of the car at the top of the ice-tank are the ice-holes D, having the hinged insulating-lids E, and usually provided with removable insulating-plugs F. I prefer to extend the ice-tank toward the middle of the car and overhead, as shown at G, providing a screen-front I for the extension. This relatively shallow extension, which usually is substantially at right angles to the main tank, is adapted to contain a layer or limited quantity of ice and receives the comparatively warm air through its open front I toward the middle of the car, thereby introducing it directly to ice before it enters the main tank. Beneath the overhead tank is cargo-space, in which the boxes or crates or perishable material generally can be loaded toward the main tank endwise and to the overhead tank upwardly. While it is advantageous to receive the great body of warm air at a point nearer the middle and upper part of the car than is afforded by the main tank, a portion of the warm air would be somewhat confined in the space formed by

the angle between the two tanks, and a sluggish movement of this air might have an injurious effect upon the upper part of the cargo beneath the overhead tank. I completely obviate this difficulty by making an opening G' into the ice-tank, such opening being located near the intersection of the two tanks and preferably being made into the main tank just below the angle, as shown in the drawings. This opening affords a direct escape for warm air into the ice-tank, its passage thereto being assisted by the draft of cold air into and through the main tank. By providing this opening the circulation is kept active in this part of the cargo-space, and the preservation of the upper layers of fruit or other material beneath the overhead tank is as perfect as in any other part of the car. By providing the overhead extension-tank adapted to contain a portion of the ice I am enabled to use a narrower tank at the end of the car and so obtain more cargo-space.

The supplementary floor of the ice-tank is formed in at least three sections, and, as that is the number I prefer to use, I have so illustrated it. More than three sections can nevertheless be used, if desired. Either of these sections can be moved to provide an opening for discharging all the ice from the supplementary bottom; but I have devised a special construction and manner of supporting and arranging the sections by which this discharging of the ice is accomplished in the most convenient and expeditious way. This arrangement makes the middle section of the three the discharging-section, such section being supported so as to be dropped to discharge its own ice and leave an opening through which the ice on the other sections can also be discharged. I thus avoid any handling or shifting of ice from one section to another before dumping it. The outer sections 1 1 are composed of slats 2, connected by braces 3. One end of each of these sections is loosely supported by a cleat 4, secured to the wall of the ice-tank and braced by staples 5, bolted to the wall of the tank and to such cleat. These staples, besides forming braces for the cleat, also keep the edge of the section, which is preferably rounded, as shown at 6, in place, so that it is practically hinged to the cleat. When the section is turned up against the wall of the tank, as shown in dotted lines, Fig. 1, the staples permit it to be lifted bodily, so as to engage the braces 3 with hooks 7, secured to the wall of the tank. The free end of the section rests upon a cleat 8, which may extend the whole width of the ice-tank.

The middle section K of the supplementary floor is preferably hinged to the cleat 8, Figs. 2 and 3. Its free edge is supported by a movable cleat L, which is carried by brackets 10, secured to the wall of the tank. To this cleat is hinged a lever M, pivoted at 11 to the wall of the tank and having its upper or free end

movable in a guide 12. By pulling this lever to the position of dotted lines, Fig. 2, the cleat L will be bodily moved on its supporting-brackets toward the wall of the tank and from beneath the section K, which can then fall to the position dotted in Fig. 2, discharging its own ice and leaving an opening through which the ice can be discharged from the other sections. When all the ice has been discharged, the outer sections can be raised and secured, as before described, leaving the ice-tank open and unobstructed. All the sections of the bottom can be easily replaced, as a floor across the tank, to receive the limited quantity of ice which the upper part of the tank is intended to hold.

I have shown at E the hinged lids for the ice-holes, which can be opened to admit ice to the tank or to admit outside air, which passes through the ice and into the interior of the car. When these lids are partially raised, they can be supported in an inclined position, opening toward the end of the car, so as to act as draft-collectors and produce a forced draft of air into the tank and car. The car is provided with an ice-tank at each end having a supplementary floor and with ice-holes and lids, so that it can be ventilated, as just described, when running in either direction, the air forced into the tank at one end escaping through the open ice-holes of the tank at the other end.

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

1. In a refrigerator-car, the combination with the ice-tank provided with an ice-hole and with a floor, of an intermediate or supplementary floor, hinged to a wall of the tank, a cleat movably supported by brackets on the opposite wall of the tank, and adapted to support the free edge of said supplementary floor, and a lever, connected to said cleat for moving the same bodily, whereby it may be caused either to support or to release said free edge.

2. In a refrigerator-car, the combination with an ice-tank, having an ice-hole and a floor, of an intermediate or supplementary floor composed of three or more sections, independently movable, and means for supporting said sections in such a way that some of said sections are movable upwardly, and the rest of said sections are movable downwardly.

3. In a refrigerator-car having an ice-tank, a drop floor or bottom, guide-brackets secured to the wall of the tank, a cleat or bar supported by said brackets, and a lever connected to said bar and pivoted within the ice-tank, whereby said bar can be moved so as to support the free edge of the floor or to release said floor.

4. In a refrigerator-car and in combination a main tank located at the end of the car, an extension of said tank communicating with its upper part and substantially at right angles, so as to leave cargo space beneath, an

opening in the end of such extension for receiving warm air, and an opening through the main-tank wall at or near the angle of the main tank and extension for receiving
5 warm air from the space beneath the extension.

In testimony whereof I have affixed my sig-

nature, in presence of two witnesses, this 30th day of August, 1897.

EDWIN T. EARL.

Witnesses:

E. R. W. FROST,
T. M. SIMPSON.