

No. 708,843.

F. G. SUSEMIHL.  
CAR DOOR.

Patented Sept. 9, 1902.

(Application filed June 2, 1902.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

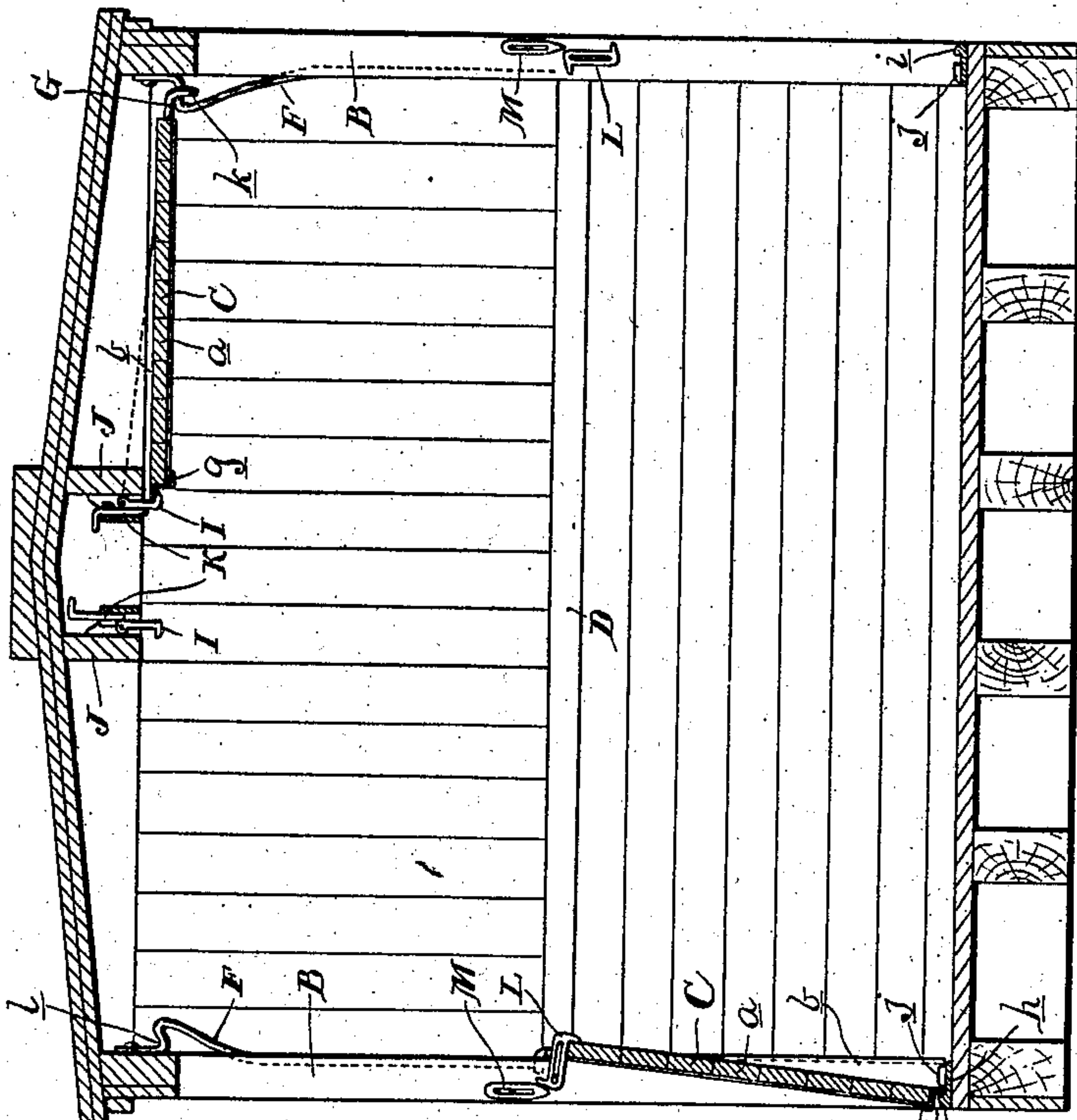
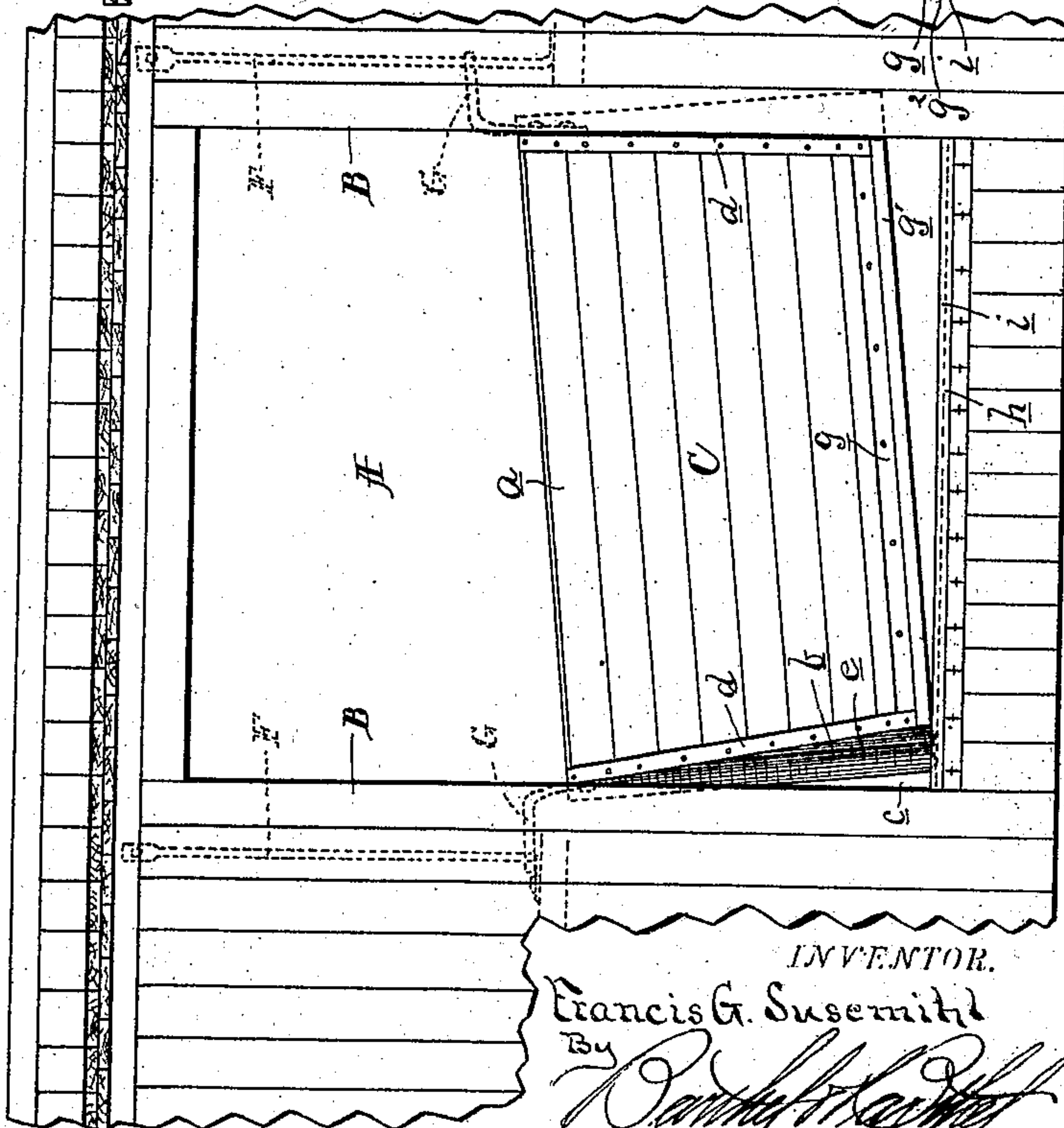


Fig. 2.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

FRANCIS G. SUSEMIHL, OF DETROIT, MICHIGAN.

## CAR-DOOR.

SPECIFICATION forming part of Letters Patent No. 708,843, dated September 9, 1902.

Application filed June 2, 1902. Serial No. 109,853. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS G. SUSEMIHL, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Car-Doors, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to the inside door used in box-cars for shipping grain and like commodities and commonly called a "grain-car door;" and the object of the invention is to provide a door of this character that will be  
15 tight-fitting, durable, capable of being easily operated, and be out of the way when not in use.

To this end the invention consists in certain novel features and details of construction and arrangements of parts, as hereinafter particularly set forth, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical cross-section through the center of a box-car, showing the door-  
25 openings on opposite sides equipped with my improved door, one of the doors being shown in position as in use and the other being shown in its out-of-the-way position. Fig. 2 is a side elevation of the car, showing the  
30 door in position in the door-opening partly raised at one end. Fig. 3 is a vertical central longitudinal section through the car, showing an inside elevation of the door as in position for closing the door-opening. Fig.  
35 4 is a horizontal section on plane  $xx$ , Fig. 3, showing a portion of the door in top plan view. Fig. 5 is a detached perspective view of the door. Figs. 6, 7, and 8 are vertical sections of different modifications of the door,  
40 as will be hereinafter more fully described.

In the drawings the invention is shown as applied to a box-car of standard construction provided with the usual door-openings  $A$  in the sides, formed between vertical posts  $B$ .

45  $C$  indicates the car-door considered as a whole. It is vertically slidable and of a size to close the lower portion of the door-opening upon the inside up to the height of the girth  $D$ , to which height the car-body is boarded up on  
50 the inside, as usual. The door is composed of a trapezoidal body portion  $a$ , preferably made of wood in the usual manner of constructing

such doors, and of lateral extensions or wings  $b$ , secured thereto and preferably made of malleable iron. The upper and lower edges 55 of the body portion, which are parallel to each other, are of such respective length that when the door is in position in the door-opening triangular open gaps  $c$  are formed between the door-posts and the adjacent edges 60 of the body. These gaps are closed on the inside by means of the extensions or wings  $b$  on the body, which form complementary parts of the door in such manner that it has the quadrilateral shape and size requisite 65 to overlap the door-posts on the inside and form a tight joint. The wings may be secured to the door-body in any suitable manner, preferably by making the wing wide enough to have a portion  $d$  thereof lap over 70 the adjacent end of the door-body and securing it thereto, said overlapping portion being preferably on the outside of the door. An important feature of my invention consists in arranging this overlapping portion of the 75 wing in such a manner that all or at least the lower portion of the door-body (in the closed position of the door) is not in a vertical plane, but slants outwardly toward its base, which, as will be well understood, has the advantage of 80 relieving the door immediately from the weight pressing against it when the door is pried up for unloading the car. The portion  $d$  of the wing, to which the door-body is secured, and the portion  $e$  thereof, which forms the mar- 85 ginal vertical end portions of the door, are connected by the intermediate web portion  $f$ , and this portion is in a plane at right angles to these first-mentioned portions and at the same time it is parallel with the ends of the 90 door-body and forms an abutment for the same. Being thus constructed, it will be seen that the door is capable of being tilted to a certain degree within the door-opening without binding and jamming between the door- 95 posts, thus permitting one end of the door to be pried up in advance of the other. To facilitate the prying up of the door, a metallic strip  $g$ , provided with a vertically-depending flange  $g'$ , is secured to the lower edge of the 100 door-body. When the door is closed, it rests upon this strip, and as the flange  $g'$  extends along the rear edge of the strip there will be formed a recess  $g^2$  between the lower edge of



the door-body and the sill for the whole length of the door, in which a crowbar may be inserted at any point to pry up the door. This strip not only protects the lower edge of the door from possible damage by the crowbar and strengthens the door itself, but also by reason of the location of the flange  $g'$  permits of giving the door the maximum outward slant. The depending edge strip  $g'$  supports the door upon a suitable metal sill  $h$ , formed with a raised shoulder  $i$  to form a tight joint with the edge strip, and raised portions  $j$  are formed or provided on the sill near the corners to form stops to hold the edge strips in position against the shoulder  $i$  and prevent any inward displacement of the door. As the principal pressure of the load will be against the lower portion of the door, it might be sufficient to make only the lower portion of the door-body slant outwardly. Thus instead of slanting the whole body, as shown in Figs. 1 to 5, the vertical cross-section thereof may be as shown in Figs. 6 and 7, in which the upper portion is vertical in the closed positions of the door. The lower portion of the door can thus be slanted more abruptly. Instead of the door lying almost wholly within the space between the door-posts, as in the previously-mentioned constructions, the slant may be increased, so that a considerable portion of the door-body projects into the car, as shown in Fig. 8. The modifications required in the constructions of the wings to admit of the described modifications will be readily understood. It will also be understood that the advantages resulting from the above-described constructions can be equally obtained with a trapezoidal door-body of reversed form from the one shown.

The car-door is guided on the inside by vertical guide-rods  $F$ , placed adjacent to the door-posts and extending up from the girth  $D$  to near the top of the car. As the car is boarded up on the inside only to the height of the girth, there will be pockets left between the frame-timbers above the girth, and the guide-rods  $F$  being placed in the pockets thus left adjacent to the door-posts and secured flush with the boarded-up portion afford room for engagement with the brackets  $G$ , which are secured near the upper corners of the door and projecting laterally on the inside of the door-posts engage the guide-rods by means of slotted ends  $k$ . At their upper ends the guide-rods are bent inwardly in order to clear the braces  $H$  and form rests  $l$  for the support of the car-door when not in use, as shown in Fig. 1 to the right. In this latter position the car-door is completely suspended out of the way against the roof of the car by the brackets resting upon the rests  $l$  of the guide-rods and by means of hooks  $I$ , pivotally secured to trimmers  $J$  and adapted to engage with the bottom edge of the car-door, as shown. To prevent accidental disengagement, each hook is provided with a locking-bolt  $K$ .

When the door is in its closed position, it may be, as is usual, locked against accidental displacement by means of the hook  $L$ , secured to the door-posts. These hooks consist of a plate hook-shaped at both ends on opposite sides and provided with a longitudinal slot through which the pivot-pin passes, which secures it to the side of the post in such manner that either end may be hooked over the edge of the door. Another plate  $M$  is vertically slidingly secured to the post in such relation to the hook that the latter may be locked thereby in its closed position, while the construction of the hook permits the same to be engaged with the door no matter in what position it may be, while at the same time these parts do not form any obstruction in the doorway and are not liable to be damaged.

The operation of the various parts will be readily understood from the above description, and the construction, which is simple, cheap, and efficient, accomplishes the objects of the invention. When it is considered that grain-car doors soon wear out, mostly as a result from the operation of opening them in unloading the cars, it will be readily understood that my construction, owing to the slanting position of the door which requires but small force to pry it up, greatly lengthens the life of the door.

Having thus fully described my invention, what I claim is—

1. The combination with the car-body and the uprights forming the doorway, of a door having end portions in the vertical plane of the uprights and forming bearings to support the door in position upon the inner faces of the uprights and a main body extending between said end portions in a plane inclined thereto and set out from the plane of said end portions (at least a material part thereof at the base) and triangular offsets continuously uniting the set-out portions of the main body with the end portions in planes substantially at right angles thereto, said offsets adapted to guide the door upon the uprights in raising it.

2. The combination with the car-body and the uprights forming the door-opening, of a vertically-raisable door having a main body the lower part of which at least is shorter than the width of the doorway and sets out into the doorway in a plane inclined thereto, vertical extensions at the ends of the main body forming bearings upon the inner faces of the uprights to support the door against outward movement, and triangular offset portions between the vertical extensions and the inclined portions of the main body forming a continuous connection between the ends of the main body and the extensions thereof.

3. The combination with the car-body and the uprights forming the doorway, of a vertically-raisable door having a main body, the lower part of which at least is shorter than the width of the doorway and sets out into the doorway at an incline to the uprights



whereby the lower edge is substantially on a line with the outer faces thereof, extensions at the ends of the main body in the vertical plane of the uprights and forming bearings upon the inner faces thereof to close the door upon the inside, and triangular offsets continuously uniting the ends of the inclined part of the main body with the vertical bearings of the door in planes substantially at right angles thereto.

4. The combination with the car-body and the uprights forming the doorway, of a vertically-raisable door having a main body the lower part of which at least is shorter than the width of the doorway and sets out into the doorway at an angle to the uprights whereby the lower edge is substantially on a line with the outer faces thereof, lateral extensions at the ends of the main body in the vertical plane of the uprights and forming bearings upon the inner faces thereof which close the door grain-tight upon the inside of the doorway and triangularly-shaped offsets on the ends of the door-body at right angles thereto uniting the door-body with the lateral extensions, said offsets provided with flanges arranged to receive the ends of the door-body.

5. The combination with the car-body and the uprights forming the doorway, of a vertically-raisable door composed of a main body shorter than the width of the doorway and offset extensions secured to the ends of the main body forming bearings upon the inner faces of the uprights and maintaining the main body in an outwardly-sloping position in the doorway with its upper edge substantially in the plane of the bearings and its lower edge set out therefrom substantially the depth of the doorway between the uprights.

6. The combination with the car-body and the uprights forming the doorway, of a vertically-raisable door composed of a main body shorter than the width of the doorway and offset extensions secured to the ends of the main body and forming bearings for the door upon the inner faces of the upright at an angle to that of the main body, said main body projecting freely outwardly between said bearings into the doorway with its upper edge substantially in the plane of the bearings and its lower edge set out therefrom substantially the depth of the doorway, the offset portions of the extensions being substantially in a plane at right angles to the main body and provided with parallel flanges to receive the ends of the main body.

7. The combination with the car-body and the uprights forming the doorway of a vertically-raisable door composed of a main body of trapezoidal form the upper and lower edges being parallel to each other and shorter than the width of the doorway and the ends oppositely inclined toward each other, triangular offsets at the ends extending the body inwardly and offsets from the aforesaid offsets extending the body portion laterally and form-

ing bearings continuous with the main body adapted to support the same in position upon the inner faces of the uprights against outward pressure and at an angle thereto whereby the main body is set out with its lower edge into the space between the uprights free to tilt in raising it.

8. The combination with the car-body and the uprights forming the doorway, of a vertically-raisable door composed of a wooden main body shorter than the width of the doorway and having oppositely-inclined ends whereby one edge is shorter than the other, and metallic extensions secured to the ends of said main body each forming two offsets one being of triangular shape and extending the main body inwardly and the other extending laterally from the aforesaid offset and forming bearings continuous with the main body and at an angle thereto adapted to support the main body upon the inner faces of the uprights in a plane inclined thereto and set out into the doorway free to be tilted in raising it.

9. The combination with the car-body and the uprights forming the doorway, of a vertically-raisable door composed of a main body shorter than the width of the doorway and with the ends oppositely inclined, (one edge being shorter than the other,) triangular offsets at the ends of the door-body and extending inwardly whereby the lower edge of the door-body is set out from the upper edge substantially to the depth of the doorway and offsets extending laterally from the aforesaid offsets and forming bearings continuous with the door-body to support the same in position grain-tight upon the inner faces of the uprights free to tilt in the doorway in raising it, the lower edge of the door-body provided with a depending flange along its rear upon which the door-body is adapted to rest and forming a continuous groove in front along the lower edge of the door-body.

10. The combination with the car-body and the uprights forming the doorway, of a vertically-raisable door composed of a main body shorter than the width of the doorway and with the ends oppositely inclined, the lower edge being shorter than the upper edge and metallic wings secured to the ends of the door-body and forming bearings upon the inner faces of the uprights, said wings formed with outset triangular offsets provided with flanges forming rabbets to receive the ends of the main body, whereby said main body is continuously united with the bearing portion of the wings in a plane outwardly inclined into the doorway free to be tilted therein in raising it.

11. The combination with the car-body and the uprights forming the doorway, of a vertically-raisable door having end portions for supporting the door upon the inner faces of the uprights, vertical slide-rods connected to the inner sides of the wall of the car adjacent to the uprights and wholly contained within the pockets formed between the frame-tim-



bers of the wall, brackets secured at the upper corners of the door and projecting laterally into engagement with the slide-rods (the ends of said brackets provided with slots engaging with said slide-rods) and a main body to said door of trapezoidal form, shorter than the width of the doorway and outset into the doorway between the uprights upon a plane inclined thereto (at least the lower portion of said main body) and offsets connecting the outset portions of the main body with the end portions of the door at right angles thereto, said offsets adapted to guide the door laterally in raising it upon the uprights free to tilt the door to a limited degree.

12. The combination with the car-body and the uprights forming the opening, of a door

in said opening adapted to slide upward upon the inner faces of the uprights and open from below, said door having an outwardly-sloping main portion extending in the doorway between the uprights and a metallic strip secured to the lower edge of the main body and having a depending flange extending along the lower edges of the main body upon the rear face thereof and upon which the door rests in its closed position.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS G. SUSEMIHL.

Witnesses:

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LEWIS E. FLANDERS.