

(No Model.)

3 Sheets—Sheet 1.

F. E. CANDA.
CAR DOOR.

No. 512,004.

Patented Jan. 2, 1894.

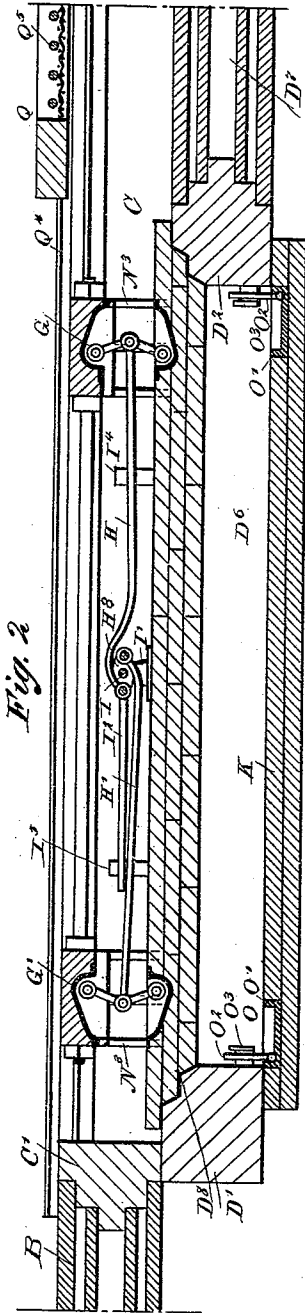


Fig. 2

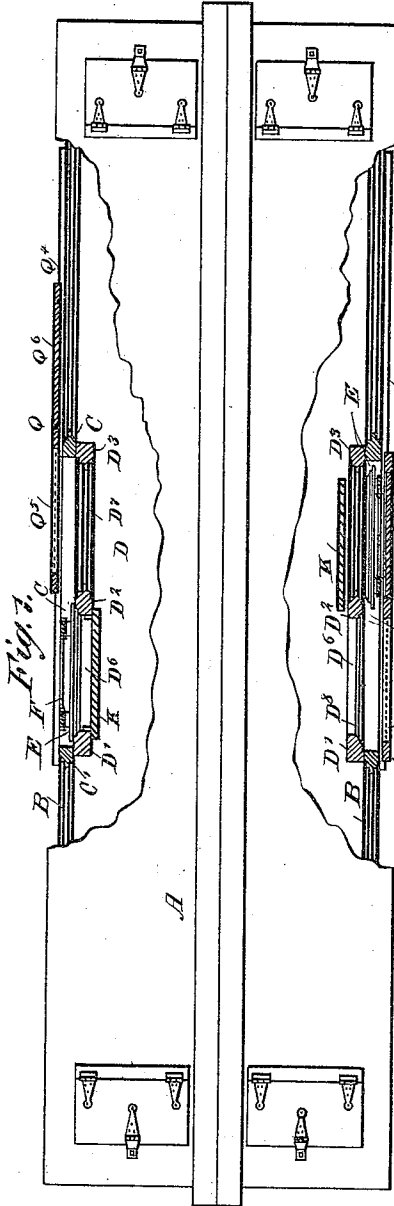


Fig. 3



Fig. 4

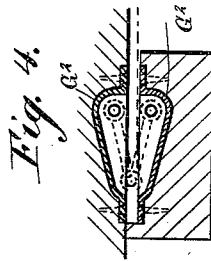


Fig. 5

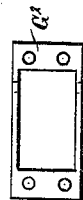


Fig. 6

WITNESSES:

Donn Twitchell
G. Sedgwick

INVENTOR

F. E. Canda

BY

Munn & Co.

ATTORNEYS.

(No Model.)

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Fig. 6.

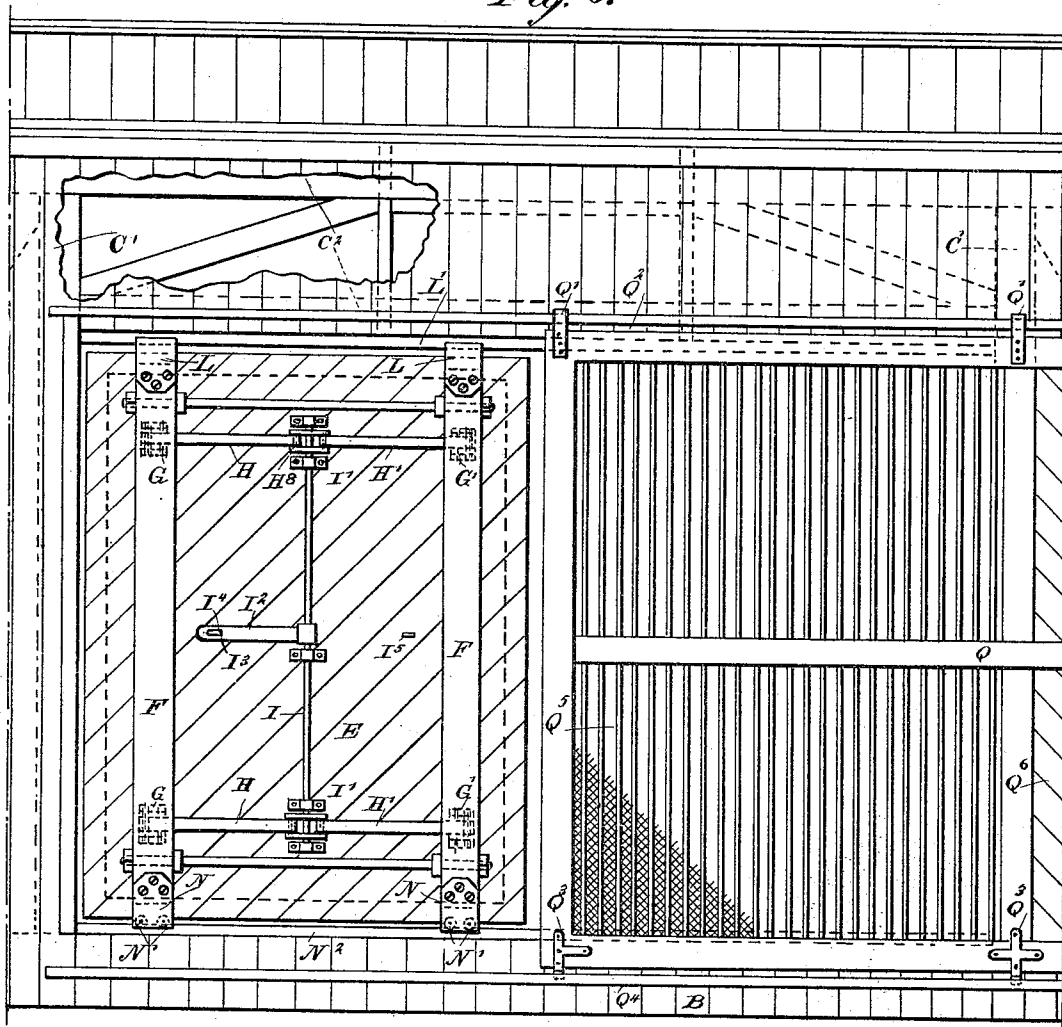


Fig. 7.

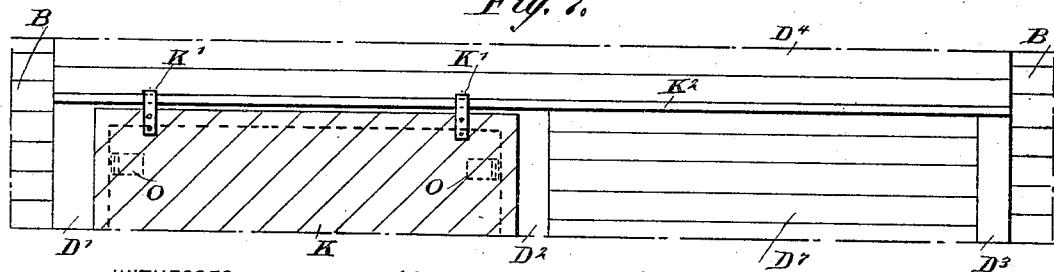


Fig. 8

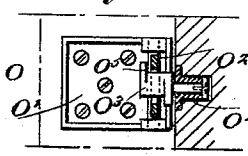
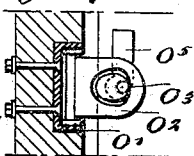


Fig. 9.



WITNESSES:

Donn Titchell
C. Sedgwick

INVENTOR

J. E. Canda

BY *Munn Ho*

ATTORNEYS.

(No Model.)

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F. E. CANDA.
CAR DOOR.

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Fig. 11

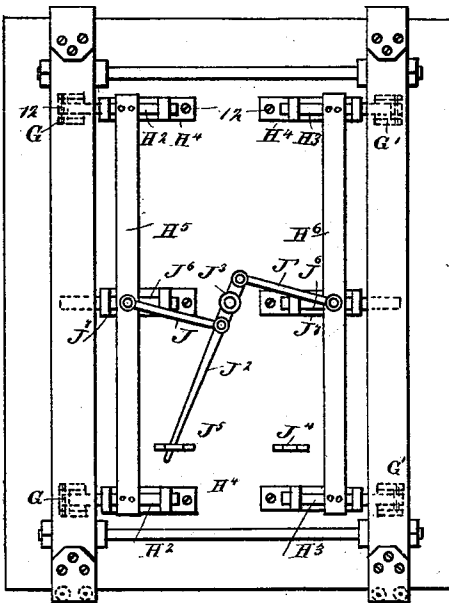


Fig. 13.

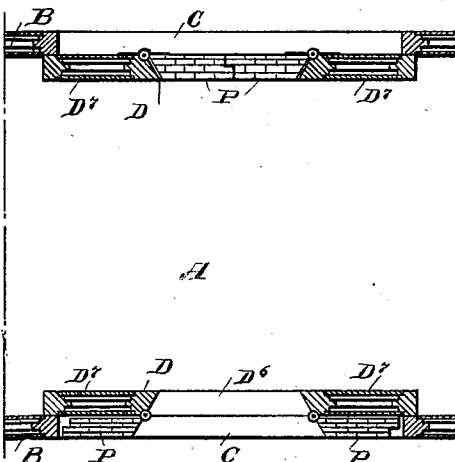


Fig. 12.

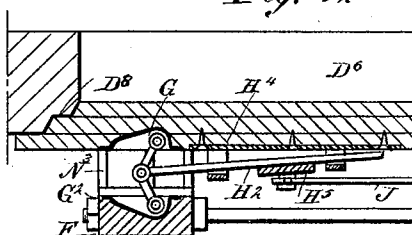
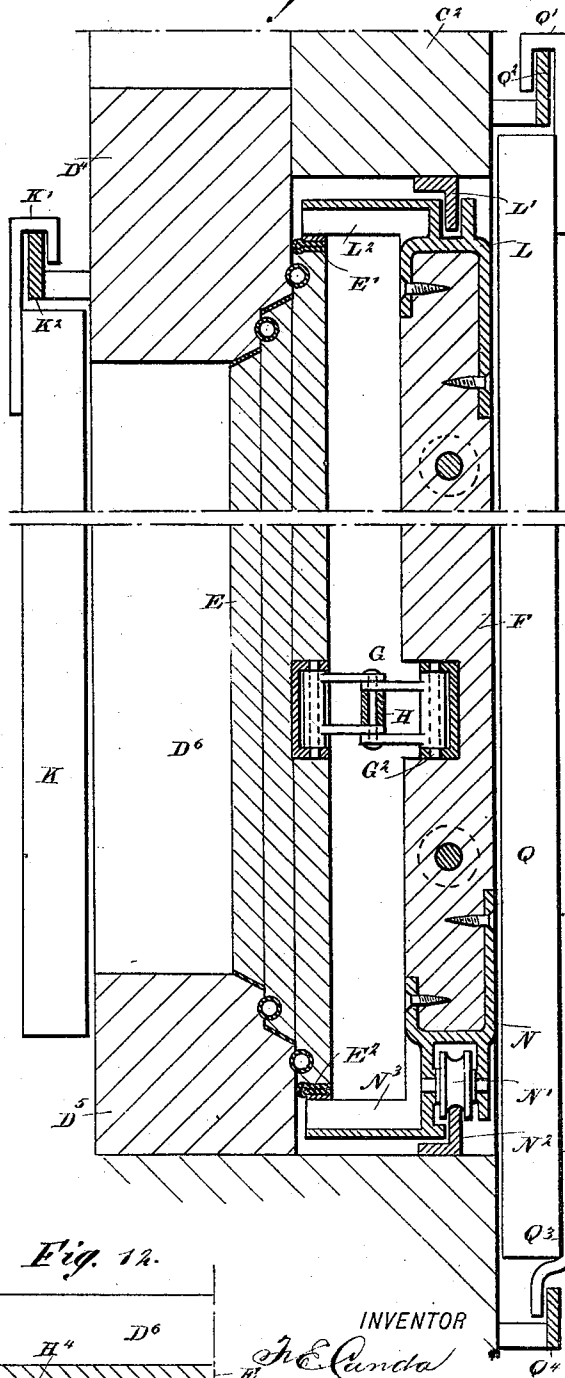


Fig. 10



WITNESSES:

Donn Twitchell
C. Sedgwick

INVENTOR

F. E. Canda
BY *Munn & Co*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

FERDINAND E. CANDA, OF NEW YORK, N. Y.

CAR-DOOR.

SPECIFICATION forming part of Letters Patent No. 512,004, dated January 2, 1894.

Application filed January 18, 1893. Serial No. 458,807. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND E. CANDA, of the city, county, and State of New York, have invented a new and Improved Car-Door, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved car door, more especially designed for refrigerator cars, and arranged to effectually render the car air-tight at the door opening, or to permit a free ventilation whenever desired.

The invention consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional plan view of the improvement as applied. Fig. 2 is an enlarged sectional plan view of the improvement showing the door seated in the car door opening. Fig. 3 is a like view of the same showing the door unseated and to one side of the car door opening, the latter being closed by a ventilating screen door. Fig. 4 is a sectional plan view of the housing for the toggle lever. Fig. 5 is a side elevation of the same. Fig. 6 is an enlarged side elevation of the improvement with parts broken out. Fig. 7 is a side elevation of part of the inner door. Fig. 8 is a sectional side elevation of the fastening device for the inner door. Fig. 9 is a transverse section of the same. Fig. 10 is an enlarged transverse section of the improvement. Fig. 11 is a face view of a modified form of the actuating device for the outer door. Fig. 12 is an enlarged sectional plan view of the same on the lines 12—12 of Fig. 11; and Fig. 13 is a sectional plan view of a modified form of the improvement.

Doors for refrigerator cars as at present constructed, are usually attached to the car body with hinges and are usually made to swing outward, and from experience it has been found almost impossible to keep them in adjustment owing to their excessive weight, and also from any undue strains in the body of the car, they sag, thereby failing to properly

seal the opening or accomplish the uses for which they are designed. It therefore follows that the temperature adjoining such doors cannot be uniformly maintained with the balance of the interior of the car, however perfect the insulation may otherwise be. The result is that frequent, large and serious loss follows, particularly to fresh meats or other perishable articles, which may occupy a space in the center of the car and adjoining the doors.

The object of the invention presently to be described in detail, is to overcome these serious objections and to furnish a door which is absolutely air-tight, adjustable to any ordinary irregularity, and not affected by any sagging of the car body, and which also enables me to construct a wider car and thus secure the benefits of the additional space adjoining the ice bunkers.

The car body A is formed in each of its sides B, with an opening C about twice the size of the car door proper, and having at its sides door posts C' which act as jambs connected with each other at the top by a suitable transom C², as plainly indicated in Fig. 6.

To the post C' and transom C² is secured an inner frame D consisting of posts, D', D² and D³, transom D⁴, and sill or threshold D⁵ for the door proper. See Figs. 1 and 10. In this inner frame D between posts D' and D², is formed the door opening D⁶, while the remaining part D⁷ of the frame, extending between the posts D² and D³, is sealed up and insulated similarly to the balance of the body of the car, as will be readily understood by reference to Fig. 3. This sealed up part D⁷ forms a recess or pocket in one side of the opening C to receive the car door E and its frame F as hereinafter more fully described.

A door E is adapted to be seated on suitable seats D⁸ formed on the inner frame D around the opening D⁶, and this door is supported on the rear face of a frame F, mounted to slide longitudinally in the opening C formed in the respective side B of the car body A. The door E is mounted to slide transversely on its frame F, so as to be moved from the rear face of the frame F onto the seat D⁸ at the time the said frame F is in front of the door opening D⁶. When the door E is on the

back of the frame F, it extends into the opening C in the side B and can be moved with the frame F from in front of the door opening D⁶ into one side of the opening C directly opposite the sealed up portion D⁷ of the inner frame D. The outer face of the frame F is flush with the outer face of the side B of the car body A, so that no projection whatever is on the side of the car body when the door is open or closed.

In order to connect the door E with the frame F and at the same time provide means for sliding the door transversely from or toward the frame, to or from the door opening D⁶, I provide sets of toggle levers G and G' connecting the door with the frame and arranged to fold in suitable housings G² secured in the said door and frame, as will be readily understood by reference to Figs. 3, 4 and 5. The toggle levers of each set are arranged one above the other, and the pivots of the toggle levers are pivotally connected by links H and H' respectively, with opposite ends of an arm H³ secured on a vertically disposed shaft I, journaled in suitable bearings I' secured to the front face of the door E.

On the shaft I, near its middle, is secured a handle arm I², for conveniently turning the said shaft to open and close the toggle levers G and G' to move the door E transversely to and from the door opening D⁶, as above mentioned. The arm I² is formed near its outer end with an aperture I³, for engagement with either of the staples I⁴ and I⁵ secured to the door E at opposite sides of the shaft I. When the arm I² is engaged with either staple I⁴ or I⁵, a padlock or other locking device may be attached to the projecting end of the respective staple to lock the arm I² in place. When the arm I² is thus locked in place on either staple I⁴ or I⁵, the door E is held in a locked position either on the frame F or on the seat D⁸ of the door frame D. See Figs. 2 and 3.

As illustrated in Figs. 11 and 12, the pivots of the toggle levers G and G', are pivotally connected with arms H² and H³ respectively, mounted to slide longitudinally in suitable bearings H⁴ attached to the front face of the door E. The several arms H² are rigidly connected with each other by a vertically-disposed bar H⁵ and the several arms H³ are likewise rigidly connected with each other by a bar H⁶. The two bars H⁵ and H⁶ are pivotally-connected by links J and J' with a lever J², at opposite sides of its fulcrum J³, located on the front face of the door E. As the pivotal connections of the links J and J' are on opposite sides of the fulcrum J³ of the lever J², the bars H⁵ and H⁶ are caused to move toward each other when the said lever is moved to the right, so that the toggle levers G and G' are opened and thereby push the door E transversely away from the frame F and into the seat D⁸ on the door frame D at the time the said frame F is in front of the door opening D⁶. When the lever J² is moved

to the left, the bars H⁵ and H⁶, are caused to move from each other whereby the toggle levers G and G' are closed and the door E is moved out of its seat D⁸ into the opening C and onto the back of the frame F. The free end of the lever J² can be locked in either above mentioned right or left hand positions by engaging a catch J⁴ or J⁵ on the door E.

In order to prevent the bars H⁵ and H⁶ from bending I prefer to connect the same at or near their middle with rods J⁶ fitted to slide longitudinally in bearings J⁷ secured to the door E and similar in construction to the bearings H⁴ previously described.

In order to shift the frame F with the door E longitudinally, I provide the said frame at the upper end with guides L fitted to slide on a longitudinally-extending rail L' attached to the under side of the transom C². The lower end of the door E is provided with hangers N carrying the grooved pulleys N', mounted to travel on the longitudinally-extending rail N², arranged in the opening C and fastened to the sill in the bottom of the opening C. It will be seen that by this arrangement, the operator having hold of the frame F can readily shift the latter longitudinally, so as to move the door E in front of the door opening D⁶ for closing the latter by moving the arm I² or lever J² to the right, as above described, or the said frame can be shifted into one side of the opening C, in front of the sealed part D⁷ of the frame D when access to the car is desired through the opening D⁶.

In order to relieve the toggle levers of the weight of the door E, I prefer to mount the latter on transversely-extending guideways L² and N³ formed transversely on the guides L and N respectively, the said guideways being engaged by suitable castings E' and E² respectively, secured on the top and bottom edges of the door E, as plainly shown in Figs. 2 and 10.

In order to close the door opening D⁶ at the inside I provide an auxiliary door K (see Figs. 7 and 10) having at its upper end hangers K' mounted to slide on a rail K² secured to the inner face of the transom D⁴. When not in use the door K is moved away from the opening D⁶ and moved opposite the sealed up part D⁷ of the door frames.

The auxiliary door K is adapted to be moved firmly onto the inner faces of the posts D' and D², the sill D⁵ and the transom D⁴ by special mechanisms O illustrated in detail in Figs. 8 and 9, and attached to the door near the corners thereof, as indicated in dotted lines in Fig. 7. Each mechanism O is provided with a recessed plate O' secured to and arranged flush with the outer face of the auxiliary door K and on it is pivoted the arm O² adapted to be either folded onto the recess of the plate O' or swung outward to engage with its aperture an eccentric pin or stud O³ mounted to turn in a bearing O⁴ secured to the inner side of the respective post D' or D².

Each of the eccentric pins is formed with a handle O⁵ to turn the respective stud so as to cause the latter to exert an outward pull on the pivoted arm O², whereby the auxiliary door is moved in the same direction until firmly seated on the inner faces of the posts D', D², the sill D⁵ and transom D⁴. It will be seen that the auxiliary door is thus seated and locked in place by the several mechanisms O each of which is operated from the outside of the car at the time the door E is moved to one side away from the opening D⁶.

In order to properly ventilate the car when the doors E and K are not in use and moved to one side of the door opening D⁶, I provide an outer ventilating door Q carrying on its upper end hangers Q' fitted to slide on a longitudinally-extending guide rail Q² secured to the respective car side as plainly shown in Figs. 6 and 10. On the lower end of the door Q are secured downwardly and inwardly-extending lugs or arms Q³ abutting against the inside of a rail Q⁴ secured to the side of the car near its lower end.

The door Q is formed with a screen section Q⁵ and a solid or sealed up section Q⁶ the entire door being of size to cover the entire opening C as illustrated in Figs. 1 and 3. In this case the screen section is in front of the door opening D⁶ and the sealed up section Q⁶ is in front of the frame F and the door E thus forming a shield for the same. The screen section Q⁵ permits air to pass to the interior of the car to ventilate the same.

As illustrated in Fig. 13, hinged doors P may be employed on the frame D, the said hinged doors, when swung outward, folding into two pockets in the side parts of the opening C in front of the sealed portions D⁷ of the frame D as plainly shown in the said figure, so that the hinged doors do not present any projection whatever on the side of the car.

It is understood that any well-known system of insulation and framing for the car door, &c., applicable to the construction above described, may be used, and the joints of the car door with the car body can be packed with rubber hose or any of the well-known methods for such packing to render the door completely air-tight.

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

1. A car, provided with an opening in its side, a separate door frame secured within the said opening, the said frame having an opening adapted to receive the door, and a sealed part located laterally on the said opening and forming a recess or pocket in the side of the car for the reception of the door when the same is removed from the said opening of the frame, substantially as shown and described.

2. In a car door, the combination with a door frame secured to the inner surface of the car side around an opening in the said side, of a door adapted to close the opening in the

said door frame, and an auxiliary door located inwardly of the inner surface of the car side and fitted to slide on the inner face of the said door frame, substantially as shown and described.

3. In a car door, the combination with a separate door frame secured to the inner surface of the car side around an opening in the said car side, the said frame being formed with a door opening and a sealed part, of a door adapted to close the opening in the said door frame, and an auxiliary door located inwardly of the inner surface of the car side and hung on the said door frame at the inside thereof and adapted to be moved over the said opening or the said sealed part, substantially as shown and described.

4. In a car door, the combination with a door frame secured to the inner surface of the car side around an opening in the said side, of a door adapted to close the opening in the said door frame, and an auxiliary door fitted to slide on the inner face of the said door frame, plates secured to the outer surface of the auxiliary door, apertured arms pivoted on the said plates, and eccentric pins mounted to turn in bearings secured to posts forming a part of the door frame, said pins being adapted to engage the apertures of the said pivoted arms, whereby the said auxiliary door can be seated on the inner face of the said door frame and locked thereto, as set forth.

5. The combination with a car having an opening in its side, of a door frame surrounding the said opening and secured to the car side at the inner surface thereof, the said door frame being formed with a door opening and a sealed part to form a pocket in one side of the said car opening, a frame fitted to slide in the said car opening, a door held to transversely slide on the said frame and a ventilating door having a screen section, and a sealed up section of which the former is adapted to register with the said door frame opening and the sealed up section is adapted to close the front of the said pocket to protect the said frame and its door located in the pocket, substantially as shown and described.

6. The combination with a car having an opening in its side, of a frame mounted to slide longitudinally in the said opening and flush with the outside of the car, a door located behind the said frame and supported on guideways extending from the same, the door being mounted to slide transversely thereon, toggle levers connecting the door with the frame, links connected with the pivots of the toggle levers, a fulcrumed arm to which said links are pivotally connected at opposite sides of its fulcrum, a shaft to which said arm is secured, and a handle for turning the shaft, to move the door transversely so as to seat it in the door opening of the car, substantially as shown and described.

7. The combination with a car formed with

an opening in its side, and a separate door
frame secured to the inner surface of the car
at said opening, the said frame being formed
with a door opening and with a sealed part,
5 of a frame mounted to slide longitudinally in
the said side opening, and a door mounted to
slide transversely on the said frame and

adapted to be seated in the door opening in
said separate frame, substantially as shown
and described.

FERDINAND E. CANDA.

Witnesses:

THEO. G. HOSTER,
EDGAR TATE.