

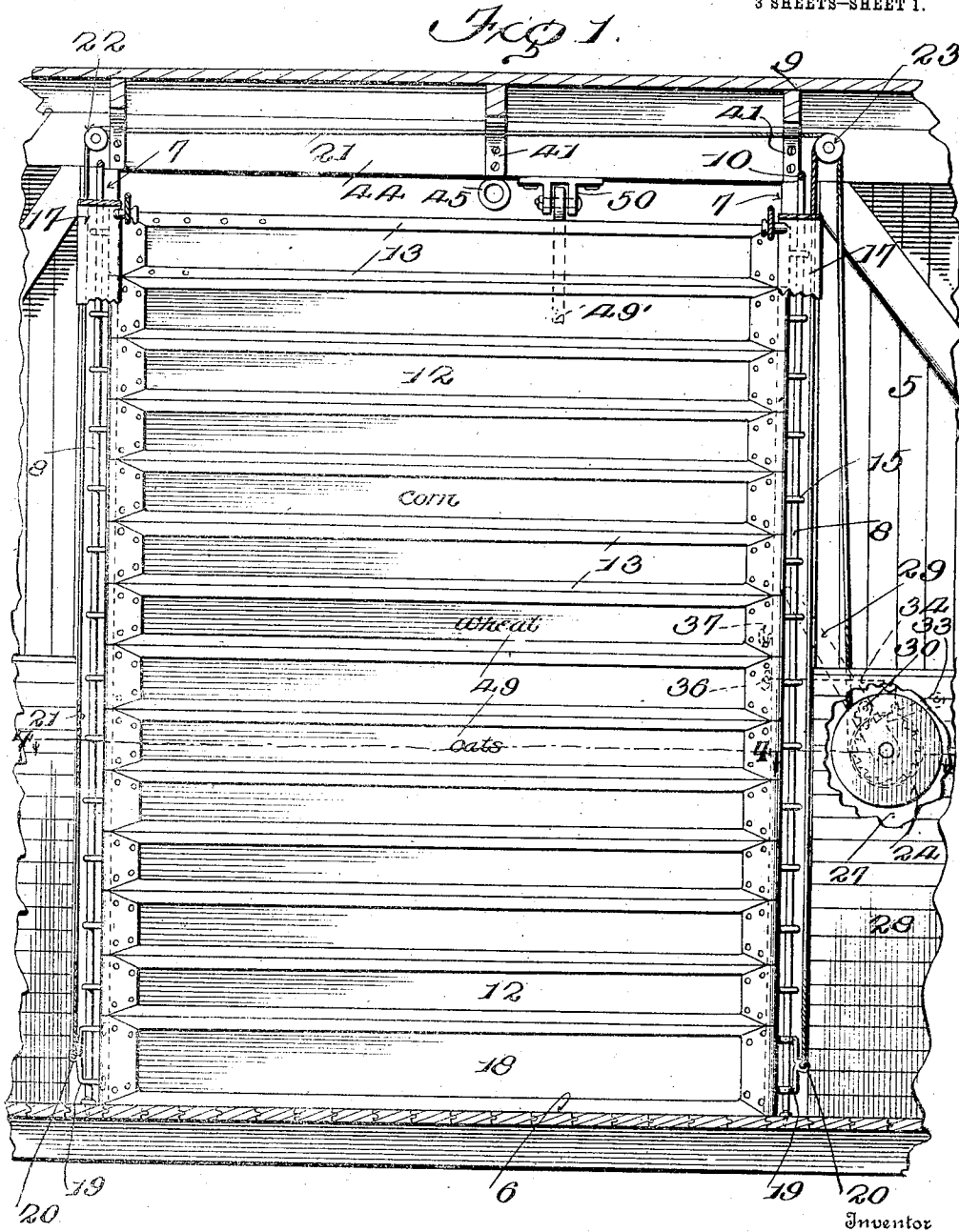
S. A. MINER.
GRAIN CAR DOOR.

APPLICATION FILED OCT. 2, 1909. RENEWED NOV. 2, 1911.

1,047,131.

Patented Dec. 10, 1912.

3 SHEETS—SHEET 1.



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Joana H. Gallin,

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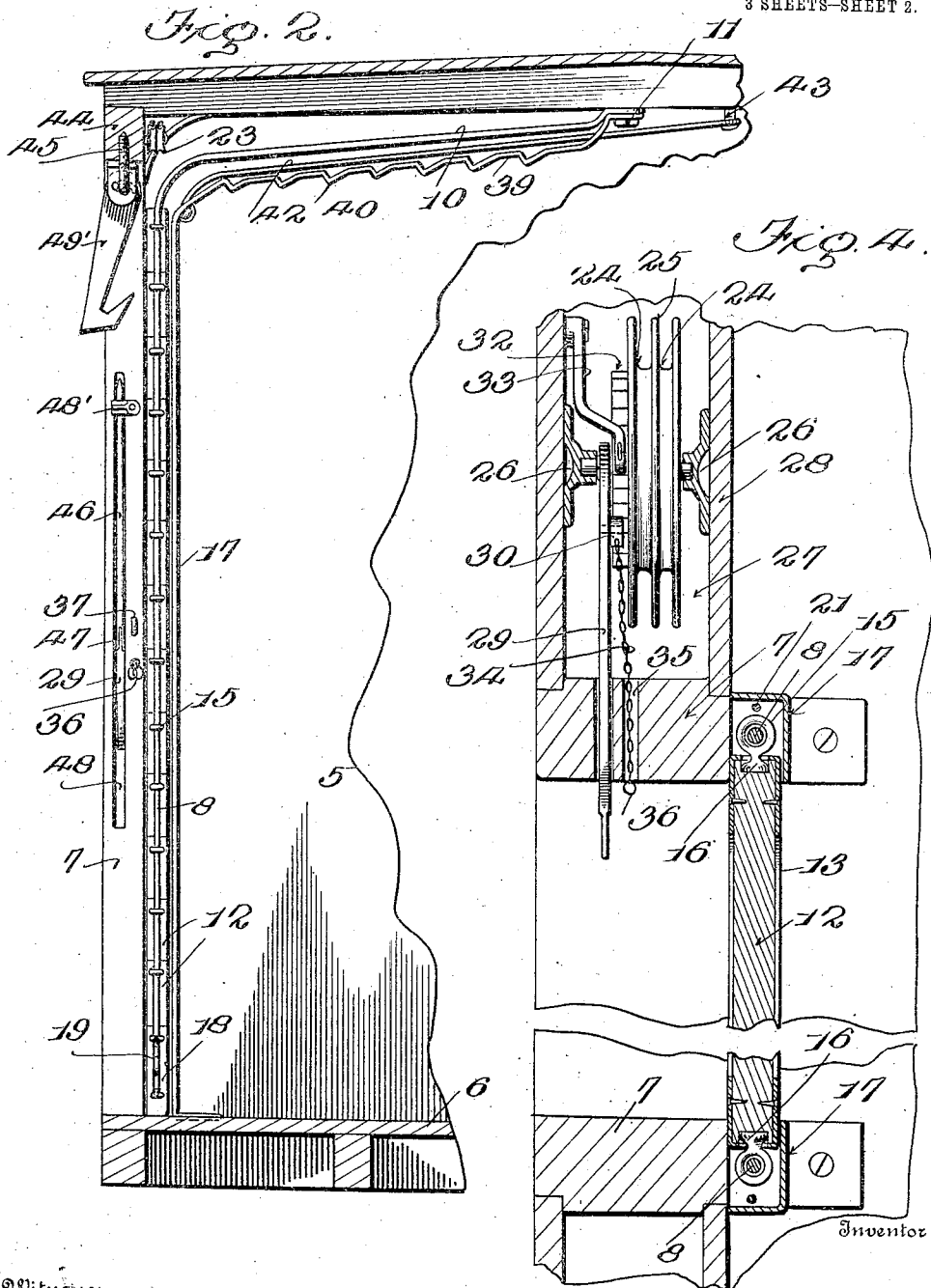
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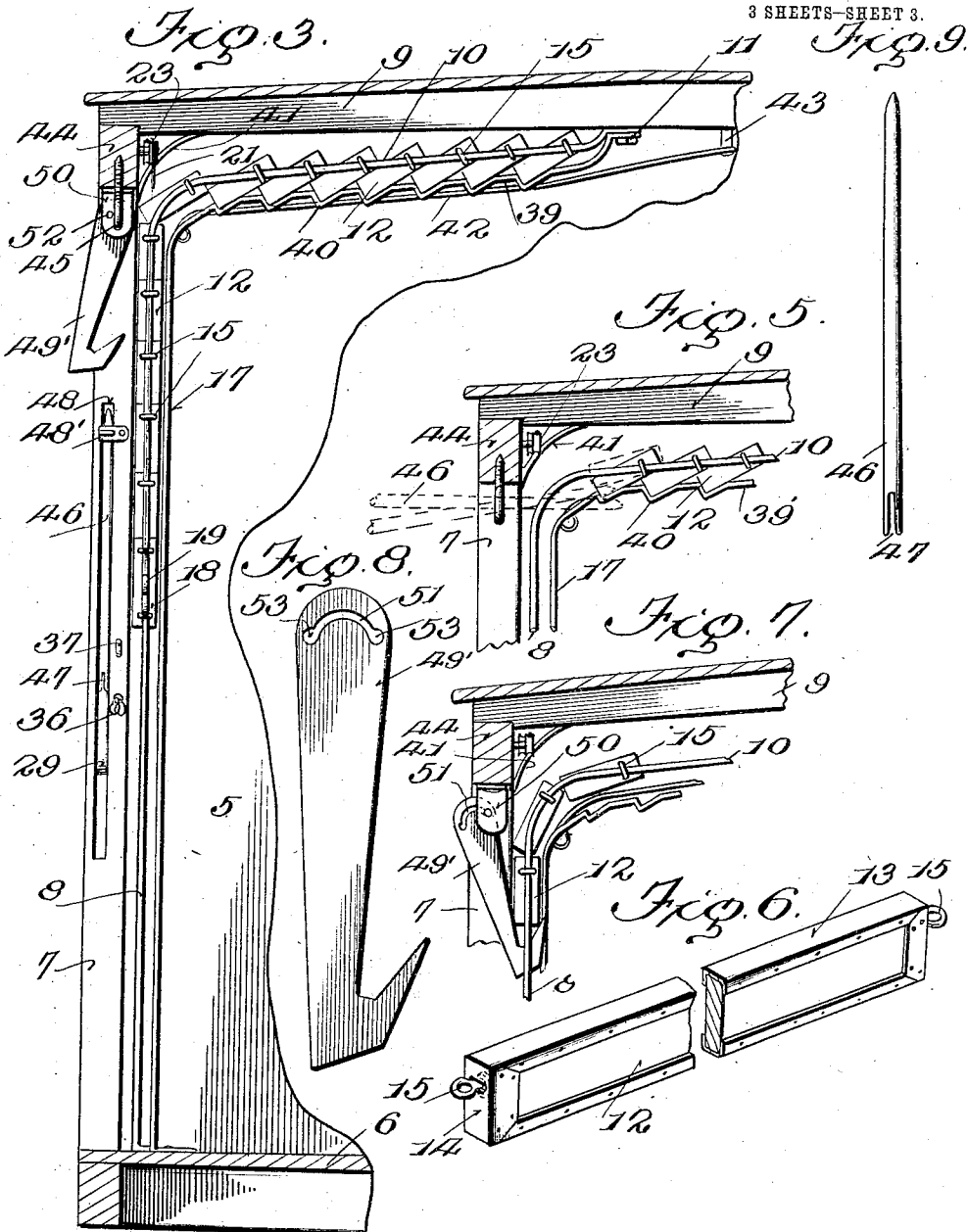
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UNITED STATES PATENT OFFICE.

STEWART A. MINER, OF DAUPHIN, MANITOBA, CANADA.

GRAIN-CAR DOOR.

1,047,131.

Specification of Letters Patent.

Patented Dec. 10, 1912.

Application filed October 2, 1909, Serial No. 520,606; Renewed November 2, 1911. Serial No. 658,234.

To all whom it may concern:

Be it known that I, STEWART A. MINER, subject of the King of England, residing at Dauphin, in the Province of Manitoba, Canada, have invented certain new and useful Improvements in Grain-Car Doors, of which the following is a specification.

This invention relates to grain car doors.

The object of the invention is to provide a grain car door including a plurality of superposed panels movable vertically to elevated position at the top of the car, thereby to permit the ready removal of grain or other material from the interior of the car.

A further object is to provide means for locking the door panels in elevated or inoperative position, and means for releasing the panels to permit the same to return to lowered position at the door receiving opening.

A further object is to provide a grain car door including a rack having a resilient guard rail arranged near the same for normally preventing the panels from engaging the teeth on the rack, said guard rail being depressed by one of the panels, thereby to permit the panels to drop by gravity into engagement with the teeth on the rack so as to retain the panels in elevated position at the top of the car.

A still further object of the invention is generally to improve this class of devices so as to increase their utility, durability and efficiency.

Further objects and advantages will appear in the following description, it being understood that various changes in form, proportions and minor details of construction may be resorted to within the scope of the appended claims.

For a full understanding of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a vertical sectional view of a car provided with a grain door constructed in accordance with my invention, a portion of the casing being broken away to show the position of the winding drum; Fig. 2 is a transverse sectional view showing the door in lowered position; Fig. 3 is a similar view showing the door partially raised and some of the panels locked in elevated position by engagement with the teeth on the rack, the auxiliary fastener or hook being shown in

normal or released position; Fig. 4 is a horizontal transverse sectional view, taken on the line 4-4 of Fig. 1; Fig. 5 is a detail vertical sectional view showing the manner of releasing the panels from engagement with the rack; Fig. 6 is a detail perspective view of one of the door panels detached; Fig. 7 is a detail vertical sectional view showing the auxiliary fastening device or hook swung laterally into engagement with the adjacent door panel; Fig. 8 is a side elevation of the hook detached; Fig. 9 is a side elevation of the extension lever detached.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The improved door forming the subject matter of the present invention is shown in connection with a grain car of the ordinary construction, in which 5 designates the body of the car, 6 the floor and 7 the door posts spaced apart to form the door receiving opening. Arranged within the car and disposed at the rear of the posts 7, are vertically disposed guide rods 8, the upper ends of which are extended inwardly beneath the top 9 of the car to form upwardly inclined extensions 10 having their terminals bolted or otherwise rigidly secured to the top 9, as indicated at 11.

Slidably mounted in the door receiving opening, is a vertically movable door including a plurality of superposed disconnected panels 12 having their opposite longitudinal edges reinforced and strengthened by the provision of metallic plates 13 and their opposite ends provided with terminal wear plates or clips 14. Extending laterally from the opposite ends of each panel 12, are eyes 15 which receive the guide rods 8 and serve to retain the panels in proper position when the door is raised and lowered. The shanks of the eyes 15 extend through suitable openings in the adjacent metallic clips 14 and are provided with enlarged heads 16, which latter are seated in correspondingly shaped openings formed in the panels so as to form in effect a swivel connection between the panels and the adjacent eyes.

The outer faces of the panels comprising the door bear against and are guided in their vertical movement by engagement with the inner faces of the door posts 7, while the inner faces of said panels bear against vertically disposed casings 17. The casings or

housings 17 extend approximately the entire height of the door and are arranged with their inner longitudinal edges overlapping the adjacent ends of the panels 12 so as to form a protection for the rods 8 and eyes 15 and thus prevent grain and other material from interfering with the operation of the door. It will here be noted that the casings or housings 17, not only form a protection for the guide rods and eyes, but, by engagement with the adjacent faces of the panels 12, also form guides for the rear face of the door, the posts 7 forming guides for the front face of the door, as before stated.

Extending laterally from the opposite ends of the lower panel 18, are U-shaped clips or yokes 19 having centrally disposed eyes 20 formed therein and to which are attached ropes, chains or other flexible connections 21. The rope 21 on one side of the door receiving opening extends over a single wheel or pulley 22 and thence over a double pulley 23 disposed on the opposite side of the door receiving opening for attachment to a winding drum 24, while the other rope or cable 21 extends over the double pulley 23 and is also attached to the drum 24, a flange 25 being formed on the drum 24 in order to separate the cables 21. The drum 24 is mounted for rotation in suitable bearings 26 disposed within the chamber or compartment 27 formed by the car-lining 28 and is provided with a cylindrical portion for engagement with an operating lever 29 so that by oscillating the lever 29, the drum 24 may be rotated to raise or lower the door. Pivotally mounted on the lever 29 is a pawl 30 adapted to engage a ratchet wheel 32 carried by the drum 24, there being a similar pawl 33 pivotally mounted on the car and engaging the ratchet wheel 32 in order to prevent rearward rotation of the drum when elevating the door. Thus it will be seen that the pawl 30, by engagement with the ratchet, serves to rotate the drum 24 when the lever 29 is oscillated, while the pawl 33, by engagement with the ratchet 32, serves to prevent rearward rotation of said drum. Secured to the pawls 30 and 33, are short chain sections 34, the free ends of which extend through an opening 35 formed in the adjacent door post 7 and are provided with terminal rings 36 adapted to engage a hook or similar fastening device 37 secured to the door post for the purpose of holding the pawls 30 and 33 out of engagement with the ratchet wheel 32 when it is desired to lower the panels constituting the door. Disposed in spaced relation to the top of the car are spaced inclined rack bars 39 having their inner ends secured to the casings 17 and their outer ends fastened by the bolts 11 to the top of the car, as best shown in Fig. 3 of the drawings. The rack bars 39 are provided with spaced teeth or pockets 40 adapt-

ed to receive the adjacent longitudinal edges or corners of the panels 12 for retaining said panels in elevated position, there being suitable arcuate guide bars 41 secured to the side and top of the car in spaced relation to the racks 39 for the purpose of guiding the panels 12 to the rack bar when the grain car door is elevated. Arranged near the inner longitudinal edge of each rack bar 39 and preferably disposed in a plane above said rack bars, are depressible guard rails 42, preferably in the form of resilient rods, the inner ends of which extend beyond the fastening device or bolt 11 and are retained in position on the top of the car by suitable anchoring members 43. The depressible guard rails 42 are inclined upwardly so that the space between the rear ends of the guard rails and the top of the car is less than the space between the forward ends of the guard rails and the top of the car so that when the first panel constituting the door, is moved to elevated position near the fixed end of the extensions 10 it will depress the guard rails 42 and thus permit the adjacent panels 12 to enter the pockets 40 and in which position they will be effectually retained until released by the operator. Thus it will be seen that by rotating the operating lever 29, the chains or cables 21 will exert a longitudinal pull on the lower panel 18 and elevate all of the panels so as to permit access to the interior of the car. As the top panel approaches the inner or fixed ends of the extensions 10, said top panel will be wedged against the top of the car thus depressing the guard rail 42 and permitting the adjacent panels 12 to drop by gravity into the pockets 40, the swivel connection between the eyes on the rods 8 and the adjacent panels permitting the latter to readily enter the pockets when the guard rails are depressed.

It will here be noted that the arcuate guide bars 41, by engagement with the adjacent longitudinal edges of the panels, serve to deflect said panels inwardly and upwardly toward the top of the car, while the pivotal connection between the panels and the extensions 10 of the guide rods 8, permit the panels to assume the position shown in Fig. 3 of the drawings.

Secured to the transverse beam 44 of the door receiving opening, is a suspension loop or eye 45 adapted to receive a removable extension lever or bar 46, the function of which is to elevate the panels 12 and thus disengage the latter from the pockets or teeth 40 of the rack bars so as to permit said panels to be moved to any desired height above the floor of the car. The lever or bar 46 is provided with a terminal socket 47 adapted to receive the reduced end of the operating lever 29, the levers 29 and 46 being housed within a suitable recess 48 when not in use, and retained within said recess by a clip 48'. 130

Grain marks or graduations 49 may be formed on the car or on the panels comprising the door, so that if it is desired to load a car with wheat, it will not be necessary to lower all of the planks or panels, but simply to drop the panels until the panel marked "Wheat" is lowered, and in this way, allow the attendants to crawl in and out of the car, as may be desired.

It will here be noted that the panels comprising the door, are independently mounted for both vertical and tilting movement on the guide rods 8 and extensions 10, so that any number of panels may be lowered, while the remaining panels are locked in inoperative position at the top of the car, said panels being released by the actuating lever 46, in the manner before stated.

When it is desired to elevate only a few of the door panels, some means must be provided for holding said panels in elevated position when the pawls 30 and 33 are released, as the guard rail 42 is only depressed to permit the panels to enter the pockets of the rack 40 when the upper panel of the door bears against the top of the car. In order to effect this result an auxiliary fastening device or hook 49' is suspended from a clip or bracket 50 secured to the upper sill of the car door, said hook being provided with a curved slot 51 adapted to receive the pivot pin 52, there being notches or recesses 53 communicating with the opposite ends of the slot 51 for the reception of the pivot pin 52. Thus it will be seen that when the hook 49' is moved with the lever 46 in one direction, the pivot pin will enter one of the notches or recesses 53 and cause the active end of the hook to engage the adjacent door panel and support the same in elevated position as best shown in Fig. 7 of the drawings, and when said hook is tilted in the opposite direction, the pivot pin will enter the other recess 53 and hold the active end of the hook out of the path of the panels so as to allow said panels to drop to the bottom of the door receiving opening.

It will of course be understood that when some of the panels are supported in elevated position either by the rack 40 or hook 49', the remaining panels may be lowered to the bottom of the door opening by releasing the pawls 30 and 33.

It will here be noted that the guard-rails 42 prevent the lower longitudinal edges of the panels from riding over the teeth of the racks 39 when the panels are moved to elevated position, thus not only to prevent excessive wear on said panels, but also to prevent undue strain on or vibration of said racks which would have a tendency to loosen the fastening devices thereof and render the racks useless after a short period of service.

Having thus described the invention, what is claimed as new is:

1. The combination with a car having a door receiving opening, of a rack secured to the top of the car, a resilient guard rail arranged near the rack, and a door comprising a plurality of superposed panels, means for raising the panels, and means for causing one of the panels to depress the guard rail thereby to permit the adjacent panels to engage the adjacent teeth on the rack.

2. The combination with a car having a door receiving opening, of a rack secured to the top of the car, a resilient guard rail arranged near the rack, a door comprising a plurality of independent superposed panels mounted for vertical movement in the door receiving opening, means for elevating the door, and means for causing one of said panels to depress the guard rail to permit the adjacent panels to engage the teeth on the rack.

3. The combination with a car having a door receiving opening, spaced guide rods disposed on opposite sides of the door receiving opening, a rack secured to the top of the car and extending to said door receiving opening, a resilient guard rail arranged near the rack, a door comprising a plurality of superposed panels having swivel connections with the guide rods and movable to elevated position above the rack, means for raising the panel, and means for causing one of said panels to depress the guard rail thereby to permit the adjacent panels to engage the teeth on the rack.

4. The combination with a car having a door receiving opening, of a rack secured to the top of the car, a resilient guard rail disposed in a plane above the rack, a door comprising a plurality of superposed panels movable to elevated position above the rack, means for elevating the panels, means for causing one of said panels to depress the guard rail to permit the adjacent panels to engage the teeth on the rack, a suspension device depending from the car at said opening, and a lever supported by the suspension device for disengaging the panels from the teeth on the rack.

5. The combination with a car having a door receiving opening, spaced guide rods disposed on opposite sides of the door receiving opening and provided with upwardly inclined extensions, the terminals of which are secured to the top of the car, spaced racks arranged beneath the guide rod extensions, a door slidably mounted between the guide rods and formed with a plurality of superposed panels having swivel eyes secured to the opposite ends thereof for the reception of the adjacent guide rods, a resilient guard rail secured to the top of the car and normally disposed in a plane above

the teeth on the racks, means for elevating the panels, and means for causing one of said panels to depress the guard rail, thereby to permit the adjacent panels to engage the teeth on the racks.

6. The combination with a car having a door receiving opening, spaced guide rods disposed on opposite sides of the door receiving opening and having their upper ends extended and attached to the top of the car, a door including a plurality of superposed independent panels, clips secured to the opposite ends of the panels, eyes swiveled in the clips and engaging the adjacent guide rods, spaced racks extending from the door receiving opening to the top of the car, and resilient guard rails arranged near the inner longitudinal edges of the racks and arranged in a plane slightly above the teeth on said racks, means for elevating the panels, and means for causing one of said panels to depress the guard-rails, thereby to permit the adjacent panels to engage the teeth on said racks.

7. The combination with a car having a door receiving opening, of a door including a plurality of superposed panels slidably mounted in the door opening, a winding drum, a flexible connection between the opposite ends of the lower panel of the door and said drum, a rack extending from the door receiving opening and inclined upwardly in the direction of the top of the car, a guide rail disposed in a plane slightly above the teeth on the rack and means for causing one of the panels to depress the guard-rail thereby to permit the adjacent panels to engage the teeth on the rack.

8. The combination with a car having a door receiving opening, guide rods disposed on opposite sides of the door opening, a door comprising a plurality of superposed panels, having terminal reinforcing clips secured thereto, eyes swiveled in said clips and adapted to receive the adjacent guide rods, casings forming housings for the guide rods and eyes and overlapping the clips of the adjacent panels, a rack inclined upwardly from the door receiving opening to the top of the car, a resilient guard rail disposed above the rack, means for elevating the panels, and means for causing one of the panels to depress the guard-rail thereby to permit the remaining panels to engage the teeth on the rack.

9. The combination with a car having a door receiving opening, of spaced guide rods secured to the opposite sides of the door opening and having their upper ends ex-

tended inwardly and upwardly for attachment to the top of the car, arcuate guide bars spaced from the extensions of the guide rods, a door slidably mounted in the door opening and comprising a plurality of superposed panels having reinforcing clips secured to the opposite ends thereof, eyes swiveled in the adjacent clips and embracing the adjacent guide rods, angularly disposed casings embracing the guide rods and the adjacent eyes and bearing against the inner faces of the panels, a flexible guard rail disposed in a plane above the rack and projecting longitudinally beyond the rack for attachment to the top of the car, means for raising the panels, and means for causing one of said panels to depress the guard rail thereby to permit the adjacent panels to engage the teeth on the rack for locking said panels in elevated position at the top of the car.

10. The combination with a car having a door opening, of a rack secured to the top of the car, a resilient guard rail arranged near the rack, a door comprising a plurality of superposed panels, means for elevating the panels, means for causing one of the panels to depress the guard rail and allow the adjacent panels to engage the teeth on the rack when said panels are elevated, and a hook pivotally mounted at the door opening and adapted to engage and support the panels when the guard rail is in elevated position.

11. The combination with a structure having a doorway, of spaced tracks arranged within the structure, said tracks having a series of stepped portions extending beneath the roof of the structure, and a plurality of door sections one to each stepped portion movable upon the tracks and arranged to seat upon the stepped portions thereof in overlapped relation.

12. The combination with a structure having a doorway, of spaced tracks arranged within the structure, said tracks having a plurality of stepped portions extending beneath the roof of the structure, a plurality of door sections one to each stepped portion movable upon the tracks and arranged to seat upon the respective stepped portions thereof in overlapped relation, and means for elevating the sections.

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

STEWART A. MINER. [L. s.]

Witnesses:

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NORMAN L. JACKSON.