



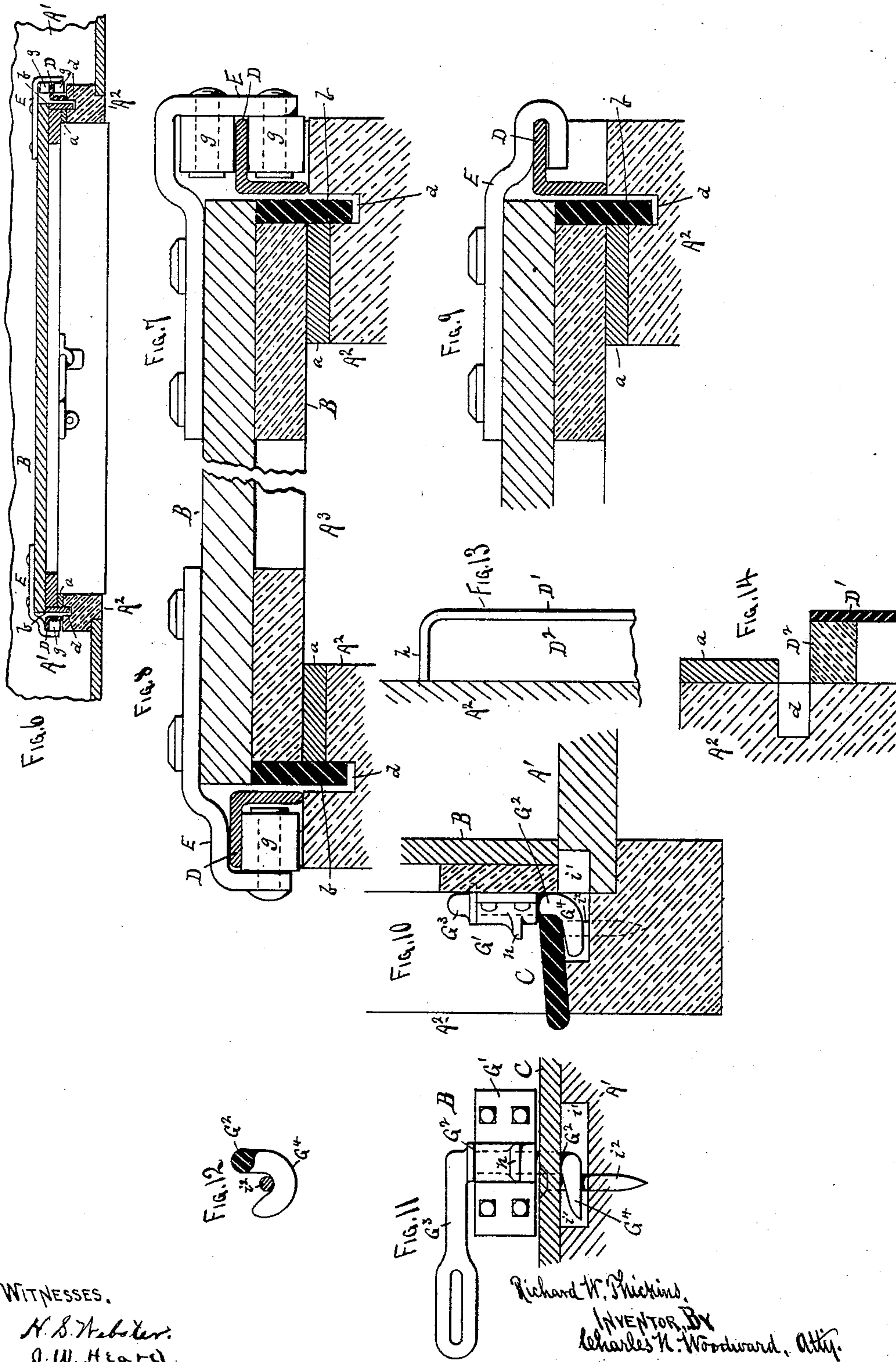
(No Model.)

2 Sheets—Sheet 2.

R. W. THICKINS.  
GRAIN DOOR FOR CARS.

No. 449,098.

Patented Mar. 24, 1891.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## GRAIN-DOOR FOR CARS.

SPECIFICATION forming part of Letters Patent No. 449,098, dated March 24, 1891.

Application filed September 5, 1888. Serial No. 284,610. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD W. THICKINS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Grain-Doors for Railway-Cars and other Structures, of which the following is a specification.

This invention relates to the auxiliary doors used in cars for shipping grain and similar products; and it consists in the construction and arrangement as hereinafter shown and described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a cross-sectional view of a portion of a car with my improved door arranged therein, the grain-door being in cross-section. Fig. 2 is a view similar to Fig. 1, showing one end of the grain-door. Fig. 3 is a sectional elevation of a portion of a car including the doorway-opening, the left-hand portion viewed from the interior and the right-hand portion viewed from the exterior of the car. Fig. 4 is a section of a portion of the car and one end of the grain-door, showing the door in position when closed, and Fig. 5 is a similar view showing the door partially elevated, these two views being intended to illustrate some of the details of the construction. Fig. 6 is a plan view in section on the line X X of Fig. 3, illustrating more fully the construction. Figs. 7, 8, and 9 are enlarged sectional details illustrating modifications in the construction of the door-hangers. Figs. 10, 11, and 12 represent enlarged detached views of the mechanism for fastening the lower edge of the door to the car. Figs. 13 and 14 represent enlarged details of a modification in the manner of forming the tracks or guides.

A' represents the floor, A<sup>2</sup> the door-posts, A<sup>3</sup> the doorway-openings, and A<sup>4</sup> the roof, of a car of the ordinary construction.

B represents the grain-door, which is formed in the ordinary manner and arranged to rest with its lower edge behind the rear edge of the metal threshold or sill C, and with its ends resting against the inner surface of the door-posts A<sup>2</sup>, the latter being protected by metal plates a, against which the grain-door slides up and down.

The ends of the door B are armed with metal plates b, whose outer or free edges lap over the edges of the plates a, and also into grooves d, formed for them in the posts A<sup>2</sup>, as shown more clearly in Figs. 7, 8, and 9. The plates a thus perform a threefold purpose—viz., as guides or projection strips between the doors B and the posts A<sup>2</sup>, and also, in connection with the overlapping plates b, serving as guides to cause the door to retain its proper position with relation to the doorway-openings, and also to form a grain-tight joint between the door and posts. The groove d is an important factor in connection with the third function of the plates b, as it renders the joint more perfectly grain-tight than if the two plates a b only were used, and does not increase the expense or number of the parts employed.

Secured to the posts A<sup>2</sup> upon each side of the doorway-openings are guides D, preferably formed of sections of L-iron, as shown, the upper outer corners of the door B being connected to these guides by hangers E, the latter with or without anti-friction rollers g, as in Figs. 1, 2, 7, 8, and 9. The guides D are set slightly inclined outward at their upper ends, as shown, the lower ends being so arranged that the hangers E will be pressed inward, and thus hold the upper part of the door tightly against the plates a and posts A<sup>2</sup>.

The lower ends of the plates b will be formed with projecting inclined "toes" b', adapted to enter sockets in the floor of the car, and thus crowd the lower edge of the door inward against the threshold C and insure a grain-tight joint between the door and threshold. The toes b' also perform another function—viz., serving to support the door in a partially-elevated position by catching over small plates e, attached to the inner surface of the post A<sup>2</sup>, as shown in Fig. 5, which shows the position of the door and the action of the parts when thus elevated. By this simple means the door may be elevated and supported across the upper part of the doorway-opening, leaving the lower part of the doorway unobstructed, which will be sufficient under ordinary circumstances in unloading the car. Then to replace the door it is only necessary to move its lower edge upward and inward



until the toes  $b'$  are free from the plates  $e$ , when the door may be lowered into position, as in Figs. 1, 2, 3, and 4. When, however, the car is to be used for other purposes than  
 5 for transporting grain, the door will be elevated until the hangers  $E$  are at the upper end of the tracks  $D$ , when the door will be free to be turned up against the inside of the roof of the car, with its lower edge caught and supported by a catch  $F'$ . The outer faces of the  
 10 hangers  $E$ , (or the rollers  $g$  upon them,) when the door is elevated run over the upper ends  $h$  of the guides  $D$ , so that the upper edge of the door is thereby supported and prevented  
 15 from falling downward. The door may thus be easily supported up out of the way of the freight in the car and all danger of annoyance from the presence of the door avoided.

Attached to the inner lower edge of the  
 20 door  $B$  by a hanger  $G'$  is a small shaft  $G^2$ , having a handle or arm  $G^3$  on its upper end and a screw-like hook or cam  $G^4$  on its lower end. This screw-cam is so arranged that when revolved it acts as a combined wedge  
 25 and hook—as a wedge to pass into cavity  $i'$  beneath the rear edge of the threshold  $C$  and draw the door downward, and as a hook to catch around a fixed pin  $i^2$ , and securely hold  
 30 the parts united, the two functions thus co-acting to produce the desired result. The operating-handle  $G^3$  of the shaft  $G^2$  is formed with a slot adapted to fit over a staple or pin  
 35  $G^5$ , located on the door  $B$ , (see Fig. 3,) by which it may be secured in place by a pin  $m$ , and thus be prevented from turning backward inadvertently and releasing the door  
 40 while the car is in transit. A projecting lug  $n$  on the hanger  $G'$  serves as a catch beneath which a bar may be placed to force the door upward when it is desired to open it.

A handle may be attached to the door  $B$  in place of the lug  $n$ , or any other suitable means employed to produce the same effect, if desired, the lug not being a necessary, although  
 45 a very convenient, adjunct to the apparatus.

Wedges  $H$  will be arranged in the upper part of the guides  $D$  to cause the hangers  $E$  or the rollers  $g$  within them to be moved outward when the door is elevated, and thus  
 50 cause the hangers or rollers to be moved outward to insure the requisite rolling of the hangers or rollers over the tops of the guides and preventing them from binding on the guides while the lower edge of the door is  
 55 being raised upward to the roof of the car.

The construction of the catch  $F'$  is an important feature of my invention, consisting of a bar or shank  $F^2$ , supported in an inclined position by a hanger or socket  $F^3$  on one of  
 60 the carlings or other part of the roof-frame of the car, as shown, the lower end of the shank  $F^2$  having a foot  $t$  to catch beneath the edge of the door and support it in its elevated position. By arranging the shank  $F^2$  in the  
 65 inclined position, as shown, when the door is to be released it is only necessary to move

the shank upward to cause the foot to be withdrawn from the door and permit the latter to be released. This is a very simple and effective means of supporting the door. 70

As before stated, the guides  $D$  will preferably be formed of sections of  $L$ -iron, with the ends bent into "ear-like" shape for properly securing them in place upon the door-posts; but I do not wish to be limited to any particular method of forming them, as I am  
 75 aware that they may be formed in many ways.

In the drawings the guides  $D$  are shown inclined inward, leaving open spaces between the inner edges and the posts  $A^2$ ; but they  
 80 may be arranged with the inner edge partially buried in the posts, or with the inner edges inclined so as to lie in close contact with the posts, and thus avoid the open spaces. The strips  $a$  and grooves  $d$  may be  
 85 dispensed with under certain conditions and the edges of the strips arranged to "butt" directly against the inner surface of the door-posts  $A^2$ . This would make a relatively  
 90 grain-tight joint, as the metal strips would soon form a groove in the wood by friction, and such a modification of the construction would not be a departure from the spirit and  
 95 intent of my invention. I prefer the construction shown, however, as it insures a more satisfactory result.

I have shown in the several views slight modifications in the construction of the hangers  $E$  on the door  $B$ .

In Fig. 7 the hanger is shown with two anti-friction rollers  $g$ , and in Fig. 8 it is shown  
 100 with only one roller, while in Fig. 9 it is shown without any roller, and while I may prefer to use one or more rollers I do not wish to be limited to their use, as the apparatus will operate satisfactorily without any  
 105 rollers, as in Fig. 9. If the latter construction is used, that portion of the hanger which comes in contact with the inner surface of the guides should be round in cross-section,  
 110 so as not to "bind" upon the guides when operated.

In Figs. 13 and 14 a slight modification is shown in the manner of constructing the  
 115 guides  $D$ , consisting in forming them of a strip of sheet or bar iron  $D'$ , bent over and supported by a wooden base or core  $D^2$ , the two parts  $D'$  and  $D^2$  being connected to the car-frame by bolts or screws passing through  
 120 both.

While I prefer to construct the guides of angle or  $L$  iron, as shown in Figs. 1, 2, 3, 6, 7, 8, and 9, I do not wish to be limited to any particular method of construction, so long as the operative edges of the guides are turned  
 125 away from each other and away from the doorway-openings, so that the hangers embrace them from the outside edges of the guides. This latter arrangement of the guides insures two important and novel results: 130  
 First, by arranging the guides with their operative edges turned in opposite directions



the hangers will not be disconnected from the guides by the twisting of the door when in operation, and, second, the guides serve to keep the door in place as it is elevated, by the fact of the latter running upward and downward between the guides.

Having thus described my invention, what I claim as new is—

1. In a freight-car, the car-body having a door-opening and vertical fixed guides on opposite sides of the door-opening within the car-body, said guides having their operative edges disposed in opposite directions from each other and away from said opening, in combination with a vertically-sliding door closing said opening and located between said guides, said door having on opposite sides runners co-operating with said guides, each runner extending back of one guide around its inner edge and having a portion extending between said guide and the adjacent side of the car-body, substantially as set forth.

2. In a freight-car, the car-body having a door-opening, the sill or threshold of said door-opening having a cavity  $i'$  and a catch or pin  $i^2$  in said cavity, in combination with a vertically-sliding car-door adapted to said door-opening and a combined locking and tightening hook and wedge  $G^2 G^4$ , carried by said door near its bottom edge and co-operating with said catch or pin  $i^2$ , substantially as set forth.

3. In a freight-car, the car-body having a door-opening and vertical grooves  $d d$  on each side of and parallel with the edges of said door-opening, vertical metallic facing-strips  $a a$ , extending on each side of the door-opening between the edges thereof and the said grooves, and fixed vertical guides on each side of said door-opening located farther away from the opening than said grooves, in combination with a vertically-sliding door adapted to said door-opening, its vertical side margins seating against said facing-strips, out-

wardly-extending vertical flange-plates  $b b$  on each side of said door fitting in said grooves  $d d$ , respectively, and runners  $E E$  on each side of said door engaging said guides, respectively, substantially as set forth.

4. In a freight-car, the car-body having a door-opening and vertical grooves  $d d$  on each side of and parallel with the edges of said door-opening, vertical metallic facing-strips  $a a$ , extending on each side of the door-opening between the edges thereof and the said grooves, sockets in the floor of the car, horizontal catches or stops  $e$  across said grooves  $d d$ , and fixed vertical guides on each side of said door-opening located farther away from the opening than said grooves, in combination with a vertically-sliding door adapted to said door-opening, its vertical side margins seating against said facing-strips, outwardly-extending vertical flange-plates  $b b$  on each side of said door fitting in said grooves  $d d$ , respectively, said flange-plates having inclined lowerends  $b'$ , which engage said floor-sockets and said catches or stops  $e$ , and runners  $E E$  on each side of said door engaging said guides, respectively, substantially as set forth.

5. In a freight-car, the car-body having a door-opening, vertical fixed guides on either side of said door-opening, and a vertically and inwardly swinging car-door having runners engaging said guides, in combination with an inclined catch  $F'$ , sliding in inclined guides fixed within the car near its top, said catch having foot  $t$ , upon which is supported the lower edge of the door when the latter is swung inward, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

RICHARD W. THICKINS.

Witnesses:

C. N. WOODWARD,  
H. S. WEBSTER.