

J. KLINKHAMMER.

GRAIN DOOR FOR CARS.

APPLICATION FILED JUNE 29, 1912.

1,054,213.

Patented Feb. 25, 1913.

3 SHEETS-SHEET 1.

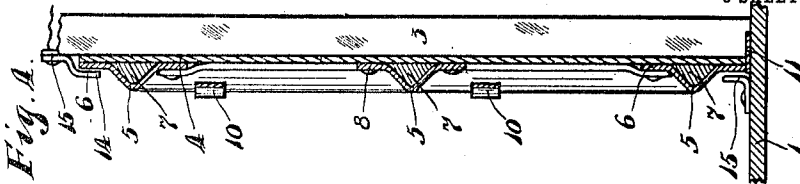
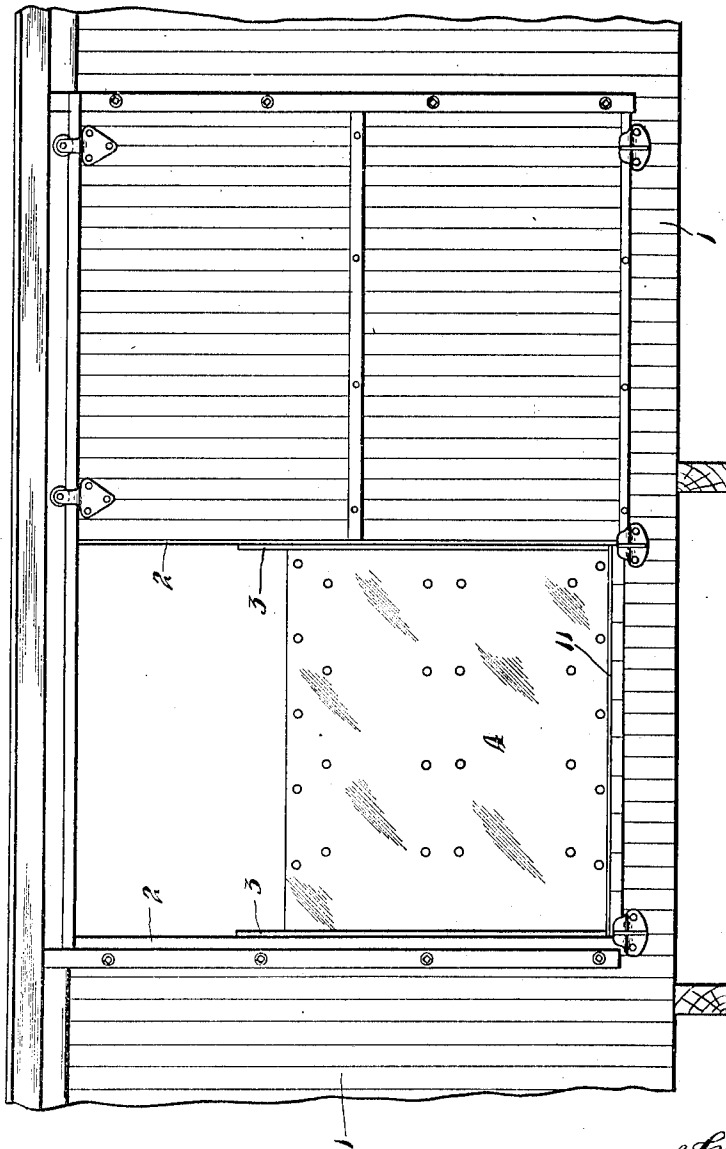


Fig. 1.



Witnesses.

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3 SHEETS—SHEET 2.

Fig. 2.

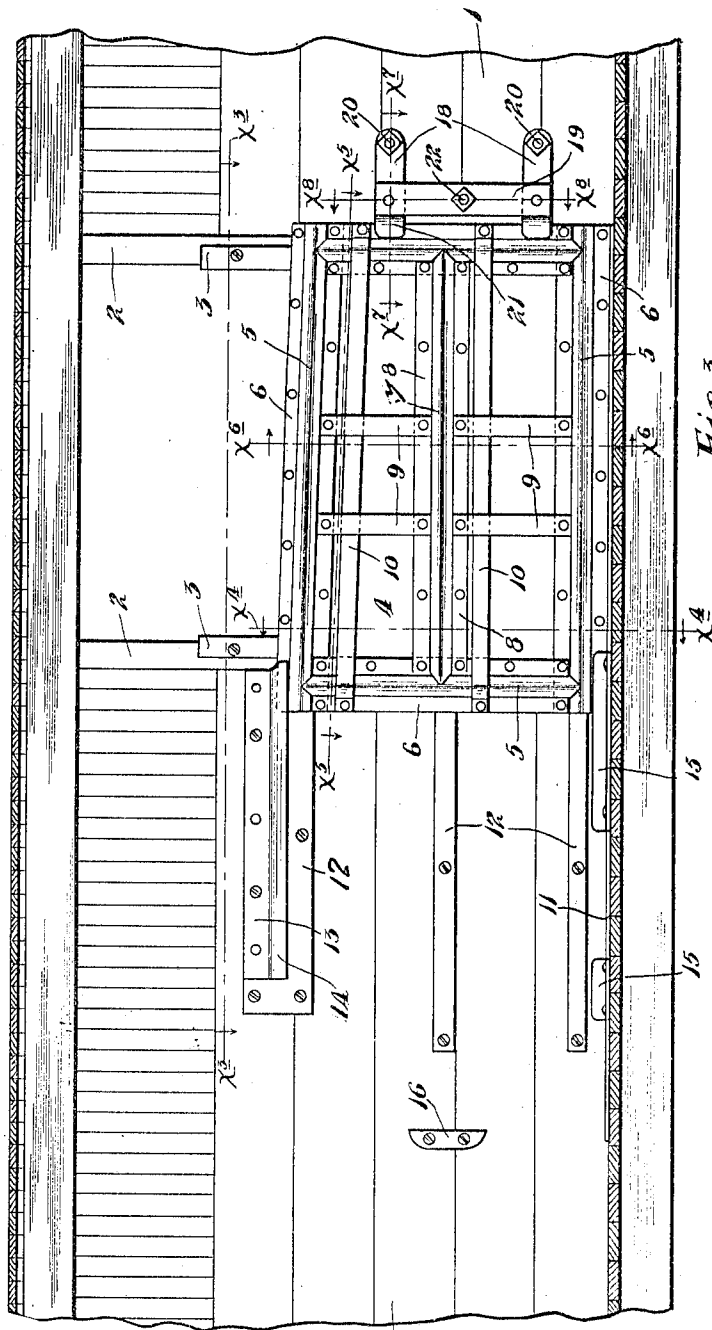
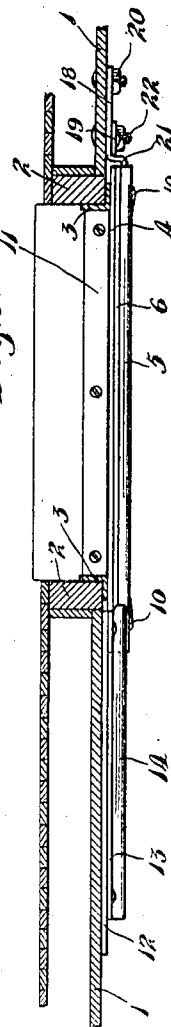


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 6.

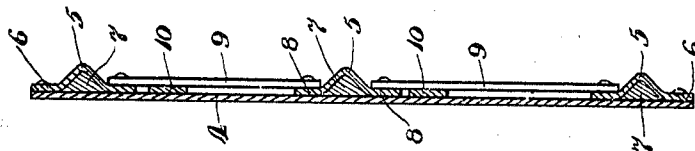


Fig. 5.

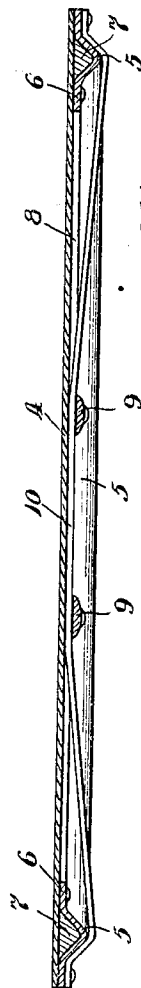


Fig. 8.

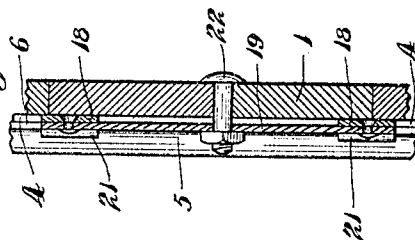
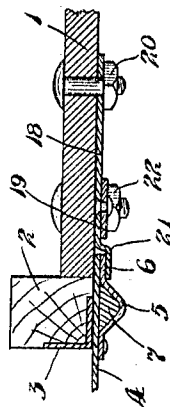


Fig. 7.



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UNITED STATES PATENT OFFICE.

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GRAIN-DOOR FOR CARS.

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To all whom it may concern:

Be it known that I, JOSEPH KLINKHAMMER, a citizen of the United States, residing at Hopkins, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Grain-Doors for Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide a grain door for cars of improved construction, and, to this end, it consists of the novel devices and combinations of devices, herein-after described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings,—Figure 1 is a view in outside elevation, showing the central portion of the body of a car having my improved grain door applied thereto; Fig. 2 is a view of my improved grain door, as shown in Fig. 1, but looking at the same from the inside of the car body which is shown in longitudinal vertical section; Fig. 3 is a view partly in horizontal section taken on the line $x^3 x^3$ of Fig. 2 and partly in edge elevation; Fig. 4 is a vertical section taken on the line $x^4 x^4$ of Fig. 2, on an enlarged scale; Fig. 5 is a horizontal section taken on the line $x^5 x^5$ of Fig. 2, on an enlarged scale; Fig. 6 is a horizontal section taken on the line $x^6 x^6$ of Fig. 2, on an enlarged scale; Fig. 7 is a detail view in horizontal section, taken on the line $x^7 x^7$ of Fig. 2, on an enlarged scale; and Fig. 8 is a detail view in vertical section, taken on the line $x^8 x^8$ of Fig. 2, on an enlarged scale.

The numeral 1 indicates the car body having, at its sides, the usual door openings formed between door posts 2. Rigidly secured to the inner corner of each door post 2, adjacent to the door opening, is an angle bar 3. The inner reversely projecting flanges of these angle bars 3 afford wearing surfaces for my improved door 4, which, as shown, is preferably constructed from sheet metal.

Around the inner marginal edge portions of the door 4, are secured in rectangular arrangement, top, bottom, and end reinforcing angle bars 5. The outer edge portions of each of these angle bars 5 are bent later-

ally outward to afford a pair of reversely projecting flanges 6. These flanges 6 lie in the same plane, one with the other, and in close engagement with the inner face of the door 4, and are rigidly secured thereto by means of rivets, or other suitable means. The outer members of the flanges 6 have their edges alined with the outer edges of the door 4 and thereby increase the thickness of said door 4 at its marginal edges.

Extending between the end members of the angle bars 5 and located intermediately between the top and bottom members of the angle bars 5, is a horizontally extended reinforcing angle bar 7. This is of the same form as the angle bars 5 and has its flanges 8 also secured to the door 4 by means of rivets, or other suitable means. To strengthen the angle bars 5 and 7, the same are provided with fillers of V-shaped strips of hard wood, as best shown in Figs. 4, 5, and 6.

The inner flanges 6, of the angle bars 5 are connected to the flanges 8 of the angle bar 7, by means of pairs of horizontally spaced, vertically extended tie bars 9. To still further strengthen the improved door, a truss bar 10 is passed between each pair of tie bars 9 and the inner face of the door 4. These truss bars 10 are located, one just below the top angle bar 5, and the other just below the intermediate bar 7, in order to strengthen the door where the greatest pressure will come. The outer ends of the truss bars 10 are passed over the vertices of the vertical end angle bars 5 and their extreme outer ends are rigidly secured to the outer flanges of said end angle bars 5, by means of rivets or other suitable means.

Secured to the floor of the car body 1, under the improved door 4, is a metallic wearing strip 11 over which the said door slides. On the inner face of the car body 1, over which the door 4 slides, is also secured a plurality (as shown, 3) of horizontally extended and vertically spaced metallic wearing strips 12. The uppermost of these wearing strips 12, is considerably wider than the other two of said strips and extends both above and below the upper horizontal edge of the door 4. To the upper edge of the wide wearing strip 12, is rigidly secured a horizontally extended bar 13 having an outwardly and downwardly projecting-retaining flange 14 that overlies and en-

gages the upper edge portion of the door 4, and holds the same for straight line movement. At its lower edge, the door 4 is held for straight line movements by means of a pair of angle bars 15 having their horizontal flanges rigidly secured to the floor of the car body 1 and having their vertical flanges turned toward the door 4. A stop block 16 is secured to the side of the car body 1, at the rear of the intermediate wearing strip 12 to limit the opening movement of the door 4.

For holding the front vertical edge of the door 4 in close engagement with the adjacent door post 2, when the door is closed, I provide a pair of vertically spaced, horizontally extended spring presser bars 18 connected at their intermediate portions by a spring tie bar 19. The ends of the presser bars 18 farthest from the door 4, are anchored to the side of the car body 1 by means of nutted bolts 20 and their opposite ends terminate in outwardly and forwardly projecting retaining lips 21 adapted to engage and hold the front vertical edge of the door 4 in tight engagement with the adjacent door post 2. To place the presser bars 18 under pressure, a nut equipped bolt 22 is anchored to the car body 1 and projects through the intermediate portion of the spring tie bar 19. As is evident, by adjusting the nut and the bolt 22, the pressure on the bars 18 may be varied, at will. In actual practice, sufficient pressure will be applied to the bars 18 to hold their retaining lips 21 a less distance from the car body 1 than the thickness of the front vertical edge portion of the door 4. In this position of the retaining lips 21, the same will be sprung outward during the closing movement of the door and will yieldingly press the said door into tight engagement with the door post 2.

By reference to Fig. 2, it will be noted that the upper edge of the door 4 is slightly inclined upward from its front vertical edge toward its rear vertical edge and the retaining flange 14 extends substantially parallel with the floor of the car body 1. By this arrangement of parts, the rear end portion of the door 4 is held in close engagement with the floor of the car body 1, by the retaining flange 14, but the remaining portion of the door is entirely out of engagement with the transverse portion of the retaining flange 14, thereby preventing

undue friction during the opening and closing movements of the door.

In actual practice, suitable means will be provided for locking the improved door in a closed position.

The above described device, while extremely simple, durable, and of comparatively small cost to manufacture, has, in actual practice, been found highly efficient for the purpose had in view.

What I claim is:

1. The combination with a car body having a door opening, of a door for said opening, top, bottom, and end reinforcing angle bars secured to said door, a tie bar connecting said top and bottom angle bars, and a truss bar passed under said tie bar and over said end angle bars, substantially as described.

2. The combination with a car body having a door opening, of a door for said opening, top, bottom, intermediate, and end reinforcing angle bars secured to said door, tie bars connecting said top, bottom, and intermediate angle bars, and truss bars passed under said tie bars and over said angle bars, substantially as described.

3. The combination with a car body having a door opening, of a door for said opening, top, bottom, and end reinforcing angle bars having the free edge portions of their flanges bent laterally outward and secured to said door, and a truss bar having its intermediate portion secured to said door and having its end portions passed over the vertices of said end angle bars and anchored with respect thereto, substantially as described.

4. The combination with a car body having a door opening, of a door for said opening, top, bottom, intermediate, and end reinforcing angle bars having the free edge portions of their flanges bent laterally outward and secured to the said door, tie bars connecting the inner laterally bent flanges of said top and bottom angle bars with the laterally bent flanges of said intermediate bar, and truss bars passed under said tie bars and over the vertices of said end angle bars, substantially as described.

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

JOSEPH KLINKHAMMER.

Witnesses:

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