No. 685,506. Patented Oct. 29, 1901.

W. R. BROWNING.

GRAIN DOOR FOR CARS.

(Application filed Apr. 11, 1901.)

(No Model.)

Fig. 1.

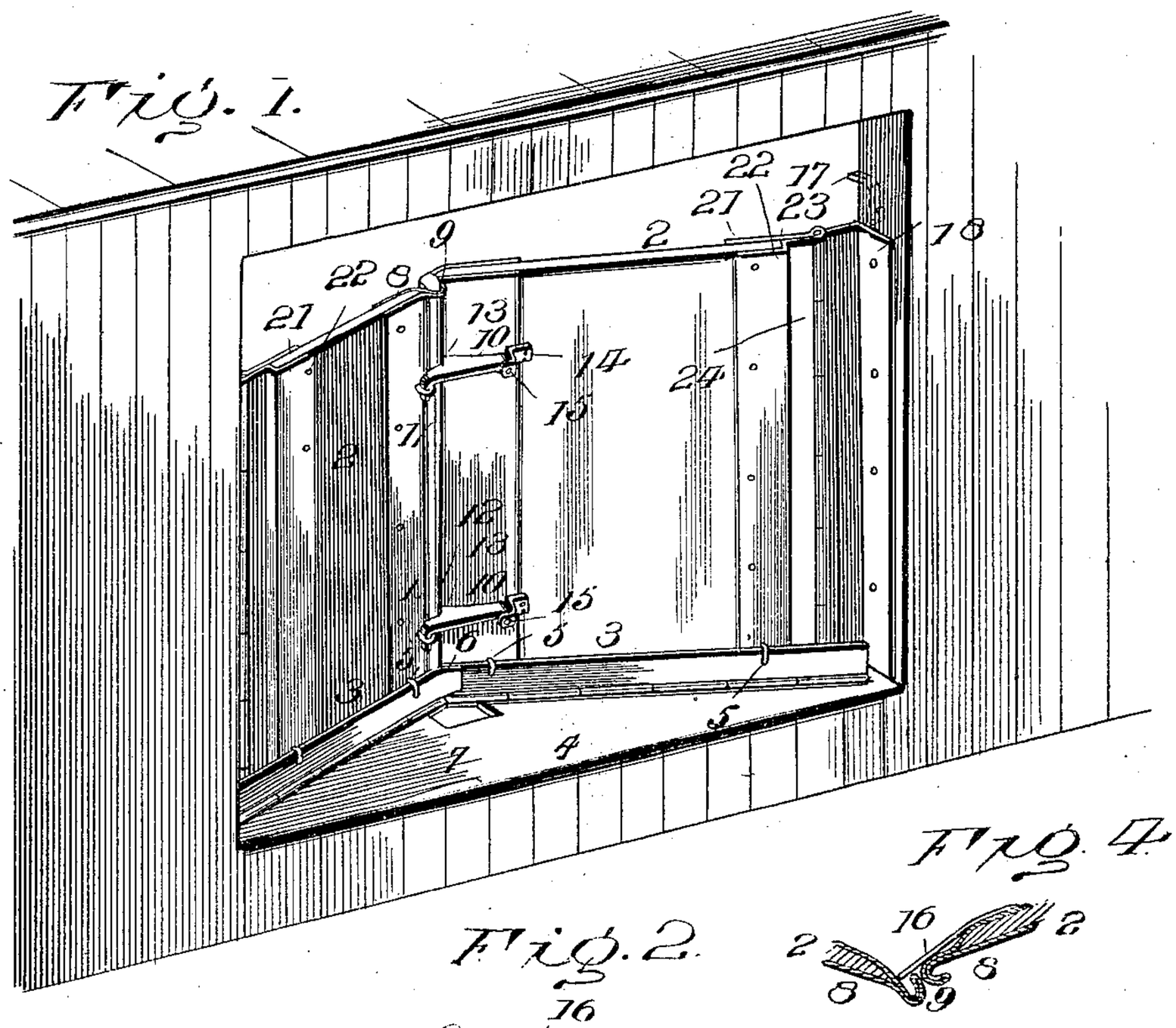


Fig. 2.

Fig. 4.

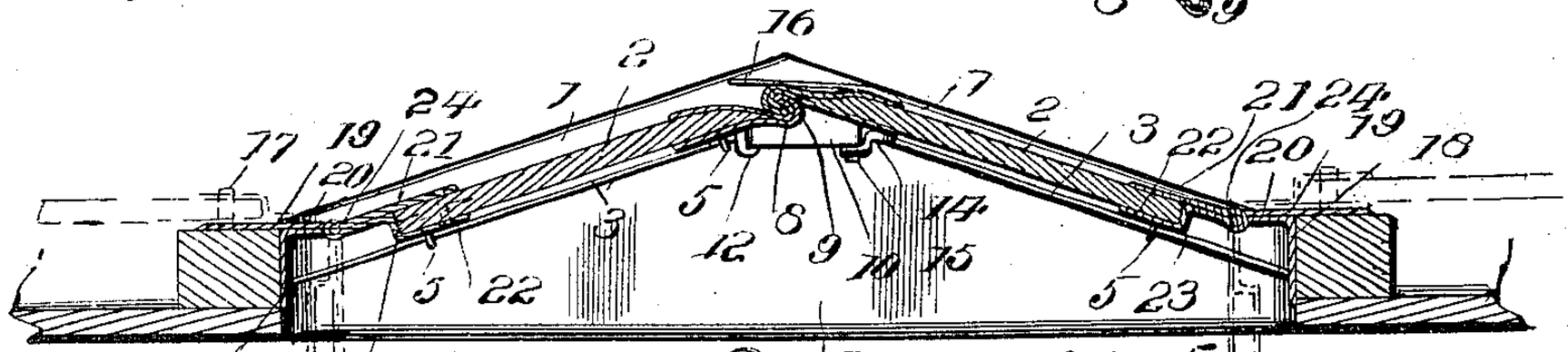
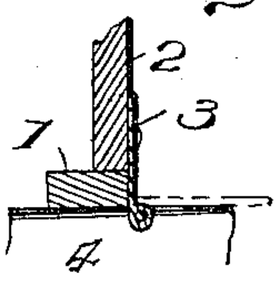


Fig. 3.

Fig. 5.



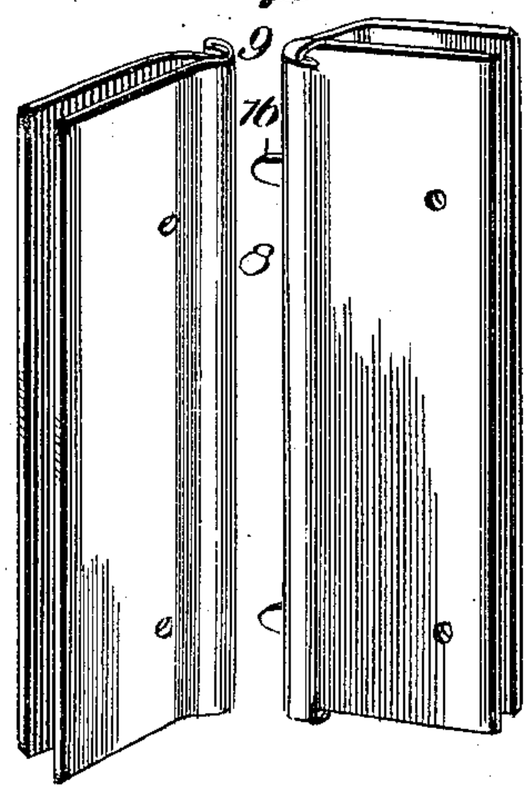
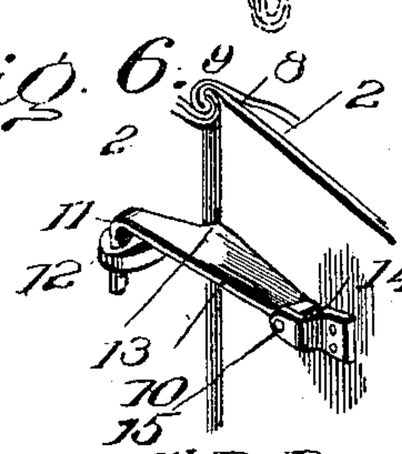


Fig. 6.



Witnesses:
John Minnie
John T. Roll

Inventor
W. R. Browning
by A. L. Bailey
Attorney

UNITED STATES PATENT OFFICE.

WALTER ROLLIN BROWNING, OF PADONIA, KANSAS.

GRAIN-DOOR FOR CARS.

SPECIFICATION forming part of Letters Patent No. 685,506, dated October 29, 1901.

Application filed April 11, 1901. Serial No. 55,413. (No model.)

To all whom it may concern:

Be it known that I, WALTER ROLLIN BROWNING, a citizen of the United States, residing at Padonia, in the county of Brown and State of Kansas, 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.

This invention has relation to swinging closures, such as doors, for confining goods stored or shipped in bulk, and is most especially adapted for freight-cars used in the transportation of grain, coal, coke, and commodities usually shipped in a loose state.

The object of the invention is the provision of a durable, tight, and lasting door capable of easy management and self-opening under the pressure of the load when released.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and the drawings hereto attached.

While the essential and characteristic features of the invention are necessarily susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view showing the application of the invention, the doors being closed and secured. Fig. 2 is a horizontal section, the dotted lines indicating the extreme positions of the doors. Fig. 3 is a detail perspective view of the inner or meeting ends of the doors. Fig. 4 is a horizontal section showing more clearly the operation of the guards to prevent the catching of the doors when swinging outward. Fig. 5 is a detail section of the lower portion of a door and the sill, showing the hinged strip overlapping the joint between the lower edge of the door and the strip applied to the sill. Fig. 6 is a detail view, on a larger scale, showing more clearly the means for bracing and fixing the joint formed between the interlocking ends of the doors.

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 opening in the side of the car or other structure to be closed in accordance with the principles of this invention has its sill provided on its top side with oppositely-inclined strips 1, conforming to the angle between the doors 2 when closed, so as to aline vertically therewith. Strips 3 are hinged in front of the strips 1, so as to fold close upon the sill 4 or against the outer edges of the strips 1. These hinged strips 3 extend in front of the lower portion of the doors 2 when the latter are closed and overlap the joint formed between the strips 1 and the lower edges of the doors 2, so as to prevent any waste of the goods confined by the doors. These strips also serve to secure the doors and are fastened thereto at their lower ends by turn-buttons 5 or analogous fastenings applied to the doors and adapted to engage over the edges of the strips 3 when the latter are turned into a vertical position. The inner ends of the hinged strips overlap, the overlapping portions being bent, as shown at 6, to conform to the obtuse angle formed between the meeting ends of the doors 2. This bent end 6 is adapted to fold into a recess 7 in the sill 4 when the strips 3 are folded outward and downward, thereby permitting said strips to lie close upon the top side of the sill.

The doors are similarly hinged to the posts or jambs at the sides of the door-opening and their meeting ends are constructed to interlock and are preferably reinforced by metal pieces 8, which terminate in recurved edge portions 9, adapted to interlock when the doors are closed. The metal pieces 8 comprise spaced portions to embrace opposite sides of the doors, to which they are secured by bolts or other suitable fastenings. These metal pieces 8 may be formed in any desired way, so long as their outer edge portions are recurved and their inner parts are adapted to be substantially connected to the doors. In the preferable construction, however, the parts 8 are constructed of sheet-steel or other metal folded upon itself and having the folded portion recurved, as shown at 9, and having the folded edge portions separated, so as to

receive between them the outer edge portion of the door. The recurved edges 9 of the metal pieces 8 constitute hooks, which are adapted to engage and form an interlocking joint between the meeting or free ends of the doors when closed. When closed, the doors incline in opposite directions, the inclination being inward at the interlocked ends, so as to better withstand the lateral stress of the load thereagainst. The meeting edge portions of the doors overlap, and a brace is interposed between the edge of the outer portion of one door and the adjacent part of the other door, so as to prevent the parting of the doors, which is essential in order to admit of their opening and the disjointing of the interlocking connection formed by the recurved edge portions 9. This bracing connection consists of pivoted arms 10, one being provided near the top edge of the doors and another near the lower edge. It is to be understood in this connection that the number of connections may be varied according to the size of the doors and that they may be located as may be found most advantageous. This pivoted arm has a bent end, forming a hook 11 to engage with an eye 12, provided upon the opposite door to the one carrying the pivoted arm. A shoulder 13 is formed at the inner edge or side of the pivoted arm to engage with the edge of the door having the eye 12, and this shoulder is inclined to admit of its point embracing the rounded edge portion of the door against which it abuts. A bracket 14 is secured to the door carrying the arm 10, and a pin 15 is supported at its ends in the bracket 14 and door and receives the arm 10, which is pivoted thereon. The arm 10 normally inclines slightly from a plane passing horizontally through its pivotal support, whereby the free end is a trifle higher than the pivotal end when the arm is in position to brace and secure the doors. This inclination of the arm admits of its settling or gravitating at its free end in order to automatically take up any play between the doors when closed. The bracing connection is located upon the outer side of the door and has positive connection with both doors upon opposite sides of the interlocking joint.

When the doors are closed, their meeting ends interlock by engagement of the recurved edge portions 9, and as the doors swing open the interlocking edges disengage by a sliding movement due to the sliding of the overlapped edge portions upon each other as the doors approach a straight line, and when the doors swing outward from the center after alinement the meeting edges again slide upon each other, and in order to prevent the interlocking of the parts 9 a guard 16 is provided and attached to one of the doors, preferably the one carrying the part 10. This guard projects beyond the edge of the door a sufficient distance to engage with the edge portion of the opposite door, so as to cause the parts 9 to clear each other as the doors swing open. One guard will be provided near the top edge of the door and a second guard near the lower edge, and these guards consist of short bars secured to the door, substantially as shown.

The hinge connection between a door and the post to which the said door is connected is continuous, so as to prevent any waste of grain or other commodity. The hinge is of such construction as to admit of the door swinging at an angle of about two hundred and seventy degrees, which is essential to admit of the doors swinging outward at a right angle to the plane of the door-opening and inward against the side of the car or structure, these extreme positions being indicated by the dotted lines in Fig. 2. When the doors are swung inward against the sides of the car, they are secured by means of hooks or other fastenings 17. The hinge member attached to the post or jamb comprises wings 18 and 19 and an offstanding portion 20 in the plane of the wing 18 and extending into the door-opening and terminating in the knuckles which receive the pintle-rod. The wings 18 and 19 are fastened to proximal sides of the post adjacent the inner corner. The hinge member attached to the door comprises spaced parts 21 and 22, between which the door is secured by bolts or analogous fastenings, an offset portion 23 bearing against the inner edge of the door and secured to the latter by lag-screws and an offstanding part 24 in line with the part 21 and terminating in knuckles matching the knuckles of the hinge member attached to the post and connected thereto by the pintle-rod. The hinge members may be formed in any manner, but are preferably constructed of sheet-steel or other metal cut to proper size and folded intermediate of its longitudinal edges and bent into the form substantially as specified. The abutting of the knuckles of the hinge members prevents any vertical movement of the doors at their hinge ends, and in order to prevent any vertical play of the doors at their meeting or interlocking ends one of the recurved edge portions 9 is closed at its ends to confine the recurved edge portion 9 interlocking therewith. This is shown most clearly in Fig. 3.

When the doors are closed, they occupy the angular position shown most clearly in Figs. 1 and 2, with the parts 10 overlapping and extending across the joint formed between their meeting ends. The hinge-strips 3 are turned into a vertical position and are secured by the fastenings 5. Outward pressure against the doors is resisted by the parts 10 and 3 and by the doors themselves because of their mutual bracing resulting from their opposite inclination. When the strips 3 are turned into a horizontal position and the fastenings 10 are released, the doors automatically swing outward under the pressure of the load, the interlocking ends being automatically disengaged simultaneously with the outward movement of the doors and prevented from again

interlocking as the doors swing outward from a straight line by the guard 16 in the manner set forth.

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

1. Oppositely-inclined doors provided at their meeting ends with an interlocking joint which is adapted to be broken automatically by the outward swing of the doors, substantially as set forth.

2. Oppositely-inclined doors having their meeting ends adapted to overlap and interlock, the interlocking joint automatically parting as the doors swing open, and a guard for preventing the catching and interlocking of the ends of the doors as they swing open, substantially as set forth.

3. In combination, oppositely-inclined doors having their meeting ends adapted to interlock and overlap, and a bracing connection arranged in the angle formed between the doors and adapted to come between the edge of one door and the adjacent part of the other door to brace the angle against lateral pressure, substantially as set forth.

4. In combination, oppositely-disposed doors having their meeting ends adapted to overlap and interlock, a brace pivoted to one of the doors and adapted to engage and embrace the edge portion of the other door to prevent separation of the doors when closed and secured, substantially as set forth.

5. In combination, oppositely-inclined doors having their meeting ends constructed to interlock, and a fastening located in the angle formed between the doors and making connection with each upon opposite sides of the joint, substantially as set forth.

6. In combination, oppositely-inclined doors adapted to interlock at their meeting ends, and a fastening located in the angle formed between the doors and making connection with each upon opposite sides of the joint and having a shoulder to engage with the adjacent edge of one of the doors to brace the latter, substantially as set forth.

7. In combination, oppositely-inclined doors adapted to interlock at their meeting ends, a fastening pivoted to the outside of one of the doors and adapted to engage with the other door to brace and secure the same when locked, and a guard applied to the inner side of the door carrying the fastening to prevent engaging of the interlocking edges of the door when swinging open, substantially as set forth.

8. In combination, oppositely-inclined doors provided at their meeting ends with recurved edge portions adapted to interlock, one of the recurved edge portions having its ends closed to prevent vertical movement of the matching recurved edge portion, substantially as set forth.

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

WALTER ROLLIN BROWNING.

Witnesses:
E. CHASE,
A. G. CHASE.