

W. S. WILLIAMS.

CAR DOOR.

APPLICATION FILED FEB. 23, 1909.

950,788.

Patented Mar. 1, 1910.

2 SHEETS—SHEET 1.

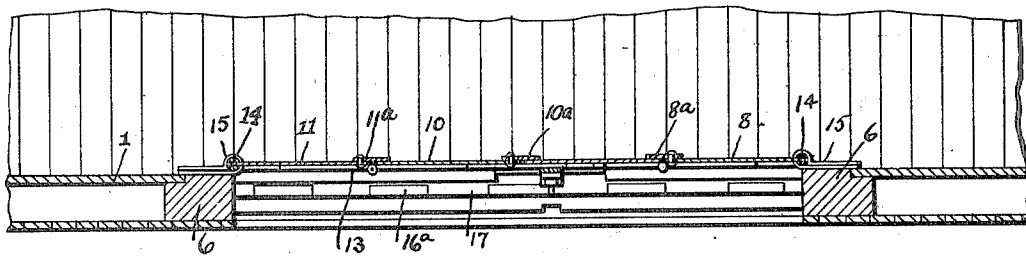
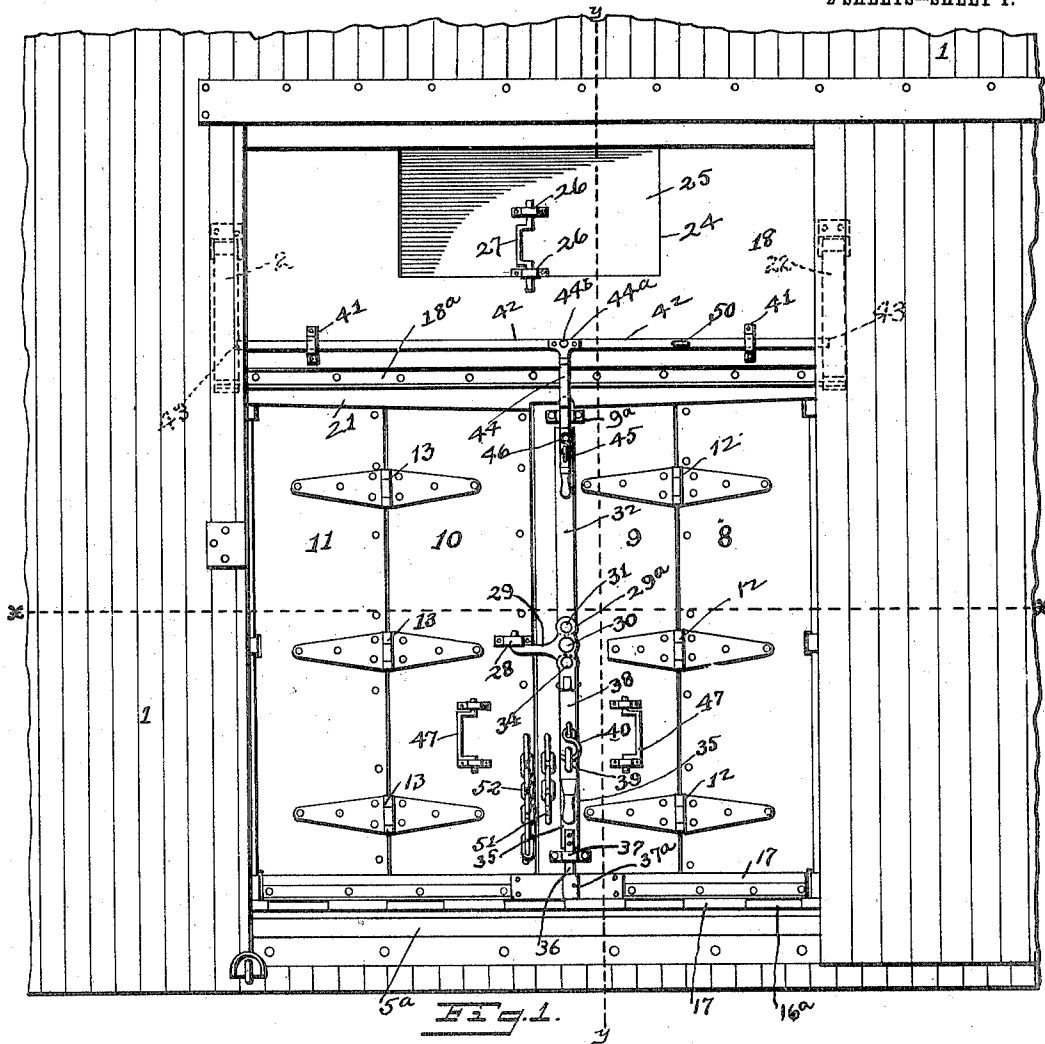


FIG. 2.

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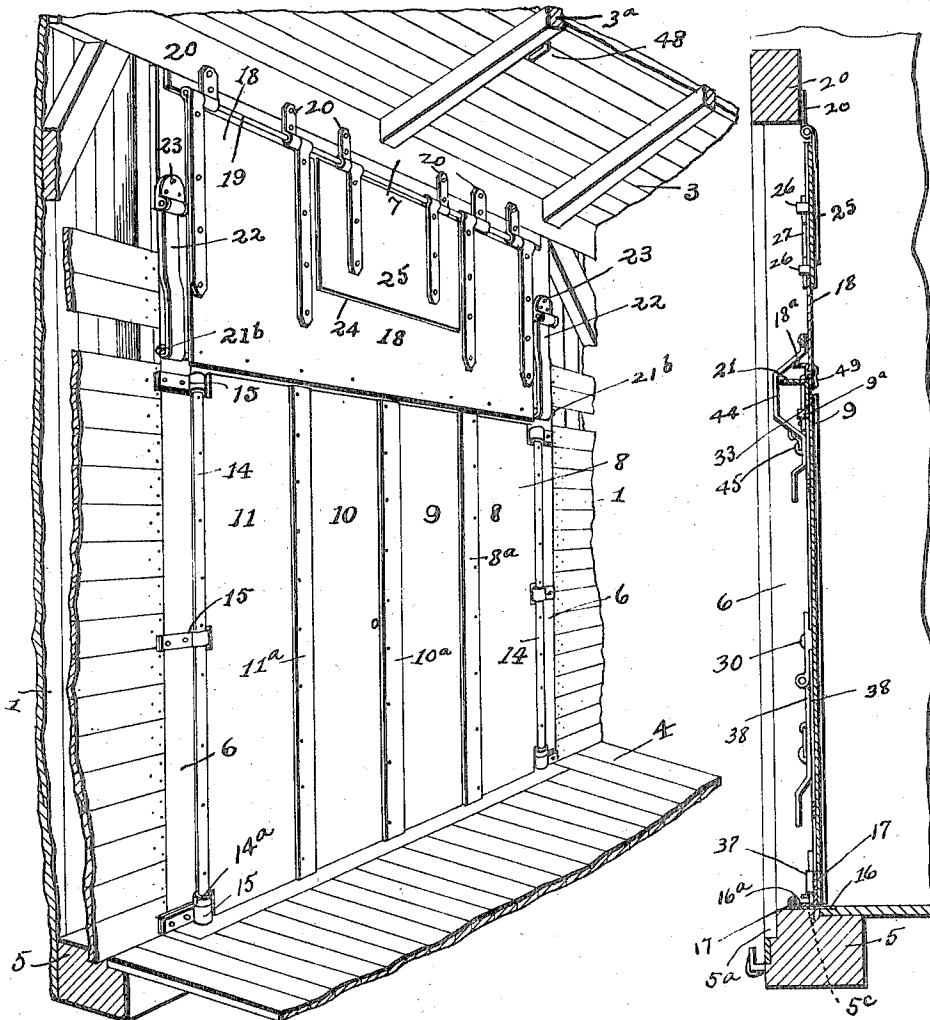


FIG. 3.

FIG. 4.

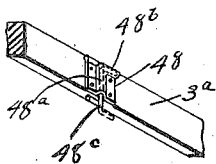


FIG. 3A.

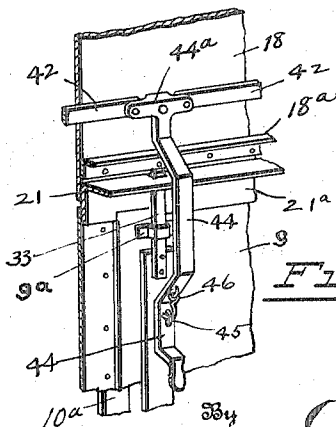


FIG. 5

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UNITED STATES PATENT OFFICE.

WALTER S. WILLIAMS, OF CLINTON, ILLINOIS, ASSIGNOR OF TWENTY-EIGHT ONE-HUNDREDTHS TO C. R. WESCOTT, TWENTY-EIGHT ONE-HUNDREDTHS TO C. W. PIFER, AND FIFTEEN ONE-HUNDREDTHS TO W. H. H. HASTINGS, ALL OF CLINTON, ILLINOIS.

CAR-DOOR.

950,788.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed February 23, 1909. Serial No. 479,441.

To all whom it may concern:

Be it known that I, WALTER S. WILLIAMS, a citizen of the United States, residing at Clinton, in the county of Dewitt and State of Illinois, have invented certain new and useful Improvements in Car-Doors, of which the following is a specification.

My invention relates to the improvement of car doors of that class which are particularly adapted for use on grain cars, although as will be obvious, my improved doors may be used to advantage on cars loaded with merchandise or other commodities.

The objects of my invention are to provide an improved door construction of this class having such parts and arrangements thereof as to effectively close a car doorway against the exit of grain or other material contained therein when the door sections are in closed position; to so construct my improved doors as to admit of their being readily opened when there is a pressure of grain or other material on the inner sides thereof; to provide improved means for locking the upper and lower doors in connection with each other; to so construct and arrange the lower door sections as to facilitate their being swung outward or inward as desired and to produce other improvements the details of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which:

Figure 1 is an outer side elevation of my improved door structure showing the sections thereof in closed and locked positions, Fig. 2 is a transverse section on line $x-x$ of Fig. 1, Fig. 3 is a view in perspective of a portion of the inner side of a car having my improved door construction, Fig. 3^a is a detail view in perspective illustrating the means which I employ for locking the upper door section in connection with the car roof frame, Fig. 4 is a vertical section on line $y-y$ of Fig. 1, and, Fig. 5 is a detail view in perspective illustrating the means employed for latching or locking the upper portions of the lower door sections.

Similar numerals refer to similar parts throughout the several views.

1 represents the vertical wall of an ordi-

nary box car, 3 the roof and 4 the floor thereof.

5 represents the bottom frame sill of the doorway, 6 the vertical door frame standards and 7 the top frame piece of the door frame.

The main or lower door of the car comprises four vertical door sections which are indicated respectively at 8, 9, 10 and 11, the sections 8 and 9 being hinged together as indicated at 12 on the outer sides of the doors and the sections 10 and 11 being likewise hinged one to the other as indicated at 13, thus providing two sectional doors, the outer section of each of which has its outer edge portion rigidly connected with a vertical hinge rod or shaft 14 (see Figs. 2 and 3), which, as shown, preferably comprises two substantially half round members between which the outer vertical edges of said door sections 8 and 11 are embraced and secured. The hinge rod thus formed is journaled in the rounded or looped end portions of hinge brackets 15 which project from and are secured to the door frame standards 6 at desirable intervals. The lower end portion of each of the hinge rods 14 is provided with a fixed collar 14^a which seats upon the rounded end of the lower member 15 and insures the suspension of the door sections at a desired height from the floor or car sill.

Upon the upper side of the sill 5, I provide a metallic sill plate 16 which extends outward from beneath the lower edges of the lower door sections and is provided at intervals with outer edge rolls or lips 16^a in which is hinged or journaled the rounded outer edge of one wing of an angular sill bar 17 which may have its remaining wing or flange turned inward against the lower portions of the door sections 8, 9, 10 and 11, as shown in Figs. 1 and 4, or which may be turned outward when said doors are in open positions, with its vertical wing depending within a face recess 5^a of the sill 5. In order to form a proper grain-tight connection between the door sections 8, 9, 10 and 11, I provide the section 8 on its inner side adjoining its outer vertical edge, with a projecting strip 8^a which when the doors are closed, overlaps the inner surface of the adjoining door section 9 and I likewise pro-

vide the door section 11 with an overlapping strip 11^a, which in a similar manner, engages the section 10. The section 10 is also provided on its outer edge portion, with an overlapping strip 10^a which engages the outer edge portion of the section 9. These strips, as will readily be understood, act when the door sections are closed together, as cleats to prevent the entrance of water or the exit of grain between said sections.

The lower door sections which I have described, extend from the lower door sill to a point in the upper half of the doorway and above these lower door sections I provide an upper door 18, which upper door is, as shown more clearly in Fig. 3 of the drawing, provided above its upper edge with a horizontal hinge rod 19 which has a swinging support in hangers 20 which depend from the inner face of the upper door frame member 7. When in its lowered or closed position, the door 18 has the lower portion of its inner side, bearing against the vertical downwardly extending member 21^a of a transverse angle bar 21, said depending vertical angle bar member also engaging the inner surfaces of the upper portions of the lower door sections 8, 9, 10 and 11, this construction being shown more clearly in Fig. 5. Each end of the transverse angle bar 21 has formed therewith a pin-like extension 21^b and these pins are engaged by the lower inturned ends of vertical hangers 22, the upper ends of which are pivotally connected to brackets 23 which are affixed to the inner faces of the frame standards 6. The lower portion of the door 18 has secured to the inner side thereof, a transverse strengthening bar 18^a which is preferably of the angular form shown more clearly in Figs. 4 and 5.

In the upper portion of the door section 18, I form a comparatively small doorway 24 in the upper portion of which is hinged a swinging door section 25, the latter being adapted to close said doorway 24 and to have its lower edge portion overlap or engage the inner surface of the door 18. The door section 25 is provided on its outer side with two fixed keepers 26 which engage loosely the vertical end portions of a bolt 27 which has a central crank bend formed therein and which bolt when in its lowest position, has its lower vertical end portion engaging the outer side of the door 18, thus locking the doors 25 and 18 in connection with each other. However, when said bolt is raised until its lower end is above the lower edge of the doorway 24, it is obvious that the door 25 may be swung inward.

To the outer side of the door section 10 is affixed a hook engaging keeper or bracket 28 with which is adapted to engage the upturned end of a horizontal hook bar 29, the latter having a T-head or vertical termination 29^a which is pivoted centrally, as indi-

cated at 30 to the outer face of the adjoining door section 9. Above the pivot point 30, the latch or head 29^a is pivoted as indicated at 31 to the lower end of an upwardly extending vertical locking bar 32, said bar extending to a point near the upper end of the door section 9 and being provided with an upwardly extending bolt-like extension 33 which bolt termination passes loosely through a keeper 9^a on the door section 9 and has its upper end portion adapted to pass as shown in Fig. 5, through an opening in the upper flange of the angle bar 21 and thus lock said angle bar against movement. The lower portion of the latch head 29^a is pivotally connected as indicated at 34, with a downwardly extending bar 35, the lower end of which is, as provided for the bar 32, provided with a tongue or bolt extension 36 which passes through a keeper 37 on the door 9 and through a keeper-like projection 37^a on the outer side of the vertical flange of the angle plate 17. Below the bar 17 the lower portion of the bolt 36 passes through an opening in the horizontal member of said angle plate 17 and thence into a socket 5^c of the sill 5. With the lower extension of the latch head 29^a, I pivotally connect one end of a handle bar 38 the lower portion of which is formed with a slotted opening through which is adapted to project, a staple 39 which has its ends secured to the bar 35. The handle member 38 is provided with a swinging hook 40 which is adapted to engage the projecting portion of a staple 39 and thus lock said handle member in a vertical position.

On the outer side of the upper door section 18, I provide near each end thereof a keeper 41 and through these keepers pass loosely horizontal locking bars 42, the outer ends of which are adapted to enter sockets 43 in the inner faces of the door frame standards and the adjacent inner ends of which are pivotally connected to opposite ends of the T-head 44^a of a downwardly extending handle member 44. This handle member which is bent outward to clear the angle bars 21 and 18^a, has its head 44^a pivotally and centrally connected as indicated at 44^b to the door 18, while the lower portion of said handle bar is slotted to receive a staple 45 which projects from the outer face of the bar 32, said staple being adapted to be engaged by a swinging hook member 46 connected with said handle bar 44. The door sections 9 and 10 are provided on their outer sides with suitable handles 47.

Assuming that the door sections are locked in the positions indicated in the drawing, the method of opening the same, consists in first disengaging the hook 46 from the staple 45 and moving the handle 44 outward and thence swinging the same upward toward the side of the car doorway, which move-

ment results in drawing the bars 42 inward toward each other and out of engagement with the sockets 43, thereby permitting the door 18 being swung upward within the car and temporarily secured in its raised position. The method of locking the door 18 in its raised position is preferably as follows: On one side of one of the roof frame beams or rafters 3^a, I secure a plate 48 which plate has formed centrally therewith a vertical raised bearing projection 48^a which has an upper horizontal arm 48^b, the latter having an upper side groove. In the vertical bearing projection 48^a is journaled the central member of a yoke-shaped latch 48^c. In Fig. 3^a of the drawing, I have shown this latching yoke in the unlocked position, that is, with its parallel arms turned toward the adjacent side of the car. When the door 18 is swung upward, however, it will be understood that by turning the latching yoke 48^c until it stands in the position indicated in dotted lines in Fig. 3^a of the drawing, the lower yoke arm may engage the rear portion of the door 18 and hold it against dropping downward, while the upper arm of said yoke engages the grooved upper side of the bearing member 48^b of the plate 48, thus necessitating a slight raising of the yoke 48^c in order to effect a disconnection therewith of the door 18.

When the handle 44 is swung to a position at right angles with that shown in Fig. 1 of the drawing, it is obvious that the staple slot therein, may be made to engage an eye or staple projection 50 on one of the bars 42, in which position the handle may be hooked or supported when not in use. The handle 44 being thus disengaged from the bar 32 the handle 38 may be in a like manner unhooked from the staple projection 39 and swung upward and outward, resulting in a swinging of the latch member 29 upon its pivot 30, causing a disengagement of the hook-end of said latch member with the keeper 28 and at the same time pulling the bar 32 downward and forcing the bar 38 upward, thereby disengaging the bolt termination 33 from the angle plate 21 and the bolt 36 from the angular sill bar 17. By thus disconnecting the door sections 9 and 10 and releasing the engagements of the bolt extensions of the locking bars with said angle plates or bars, it is obvious that the door sections 8, 9, 10 and 11, may be freely swung outward or inward and the hinged sections folded into compact form. When the lower door sections are swung outward, it is obvious that the angle bar 21 with which said sections are in contact, will be free to swing in its bearings until the upper ends of the door sections have passed out of contact therewith and the angular sill bar 17 will be forced outward and downward until its vertical member lies within the recess 5^a of the sill 5, in

which position said angular sill plate will form a metallic protection for the sill. In case it may be desired to partially open the lower or main doors outward, I have provided the door section 9 with a chain supported hook 51 which may be engaged with the desired link of a short chain 52 which depends from the door section 10.

As will be understood, the doorway 24 may be utilized when its door 25 is swung inward, as an inspection doorway through which the contents of the car may be conveniently inspected from a point sufficiently high to prevent the material within the car from escaping therefrom.

In the loading of grain cars equipped with my improved doors, it is obvious that the lower doors may be closed and the upper door 18 opened to admit the discharging end of the grain spout.

From the construction and operation which I have described, it will be understood that the opening of the lower doors will result in an instantaneous discharge of grain from the car and in case the elevator chute is of such size as to take the full flow of grain, it is obvious that a stream of grain of equal width with the doorway may be discharged from the car immediately on the opening of the lower doors. However, where it is desired, the lower doors may be relieved from the pressure of the grain immediately bearing on the inner sides thereof, by opening the doors slowly and retaining them in a partially opened condition by the engagement of the chain hook 51 and chain 52. Where the car is used for other commodities than grain, it is obvious that the lower doors may be swung inward instead of outward if the character of the load permits.

It will be seen that my improved door construction is simple and that by its use the necessity of employing the usual outside sliding car doors may be obviated, although such outer doors may be used in conjunction with my improved door construction.

What I claim, is—

1. In a door construction for cars, the combination with a car body having a doorway and a door frame, vertical swinging doors hinged in opposite sides of the door frame and comprising hinge sections, of a door section above said first mentioned door sections and having a swinging support in the upper side of the car doorway, a transverse bar pivotally supported between the side door frames with the inner side of which the upper portions of the lower door sections and the lower portion of said upper door section are adapted to engage, and means for locking said door sections in engagement with said bar.

2. In a door construction for cars, the combination with a car having a doorway therein, of lower door members having

swinging connections with the car door frame, of an upper door section having a swinging support from the upper side of said door frame, a transverse bar having a
5 pivotal and swinging support, said bar adapted to be engaged by the lower portion of said upper door and the upper portions of said lower doors when said door sections are closed, and means for locking said piv-
10 oted and swinging bar against movement and at the same time locking said upper swinging door against movement.

3. In a door construction for cars, the combination with a car body having a door-
15 way and a door frame, doors hung at opposite sides of the door frame, an upwardly movable door section above said first named doors, a transverse bar pivotally supported between the sides of the door frame with
20 the inner side of which the upper portions of the lower doors and the lower portion of the upper door are adapted to engage, and means for locking said doors in engagement with said bar.

25 4. In a door construction for cars, the combination with a car body having a doorway, and doors hinged in opposite sides of said doorway, of an upper swinging door above said first mentioned doors, horizontal
30 bars having a sliding support on said upper door, a handle with which said horizontal bars are pivotally connected, a locking bar movable against one of said first mentioned doors, and means for locking said handle in
35 connection with said locking bar.

5. In a door construction for cars, the combination with lower doors having a swinging connection with the side frames of the car doorway, and upwardly movable door above said first mentioned door, mov- 40
able horizontal locking bars carried by said upper door and adapted to engage the car door frame, a pivoted and swinging bar adapted when locked against movement to prevent the outward movement of said lower 45
doors, means for locking said lower doors against inward movement, and means for releasing said horizontal locking bars from en-
gagement with the car door frame and for releasing said pivoted and swinging bar. 50

6. In a door construction for cars, the combination with a car body having a door-
way and a door frame, of doors hung at op-
posite sides of the door frame, an upwardly
movable door section above said first named 55
doors, a transverse bar pivotally supported between the sides of the door frame with the inner side of which the upper portions of the lower doors and the lower portion of the upper door are adapted to engage, 60
and means for locking said doors in en-
gagement with said bar, said bar likewise being movable upwardly.

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

WALTER S. WILLIAMS.

Witnesses:

ARTHUR F. MILLER,
CHARLES W. PIFER.