J. HENRY.

GRAIN DOOR FOR CARS.

APPLICATION FILED JUNE 10, 1910.

993,250.

Patented May 23, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

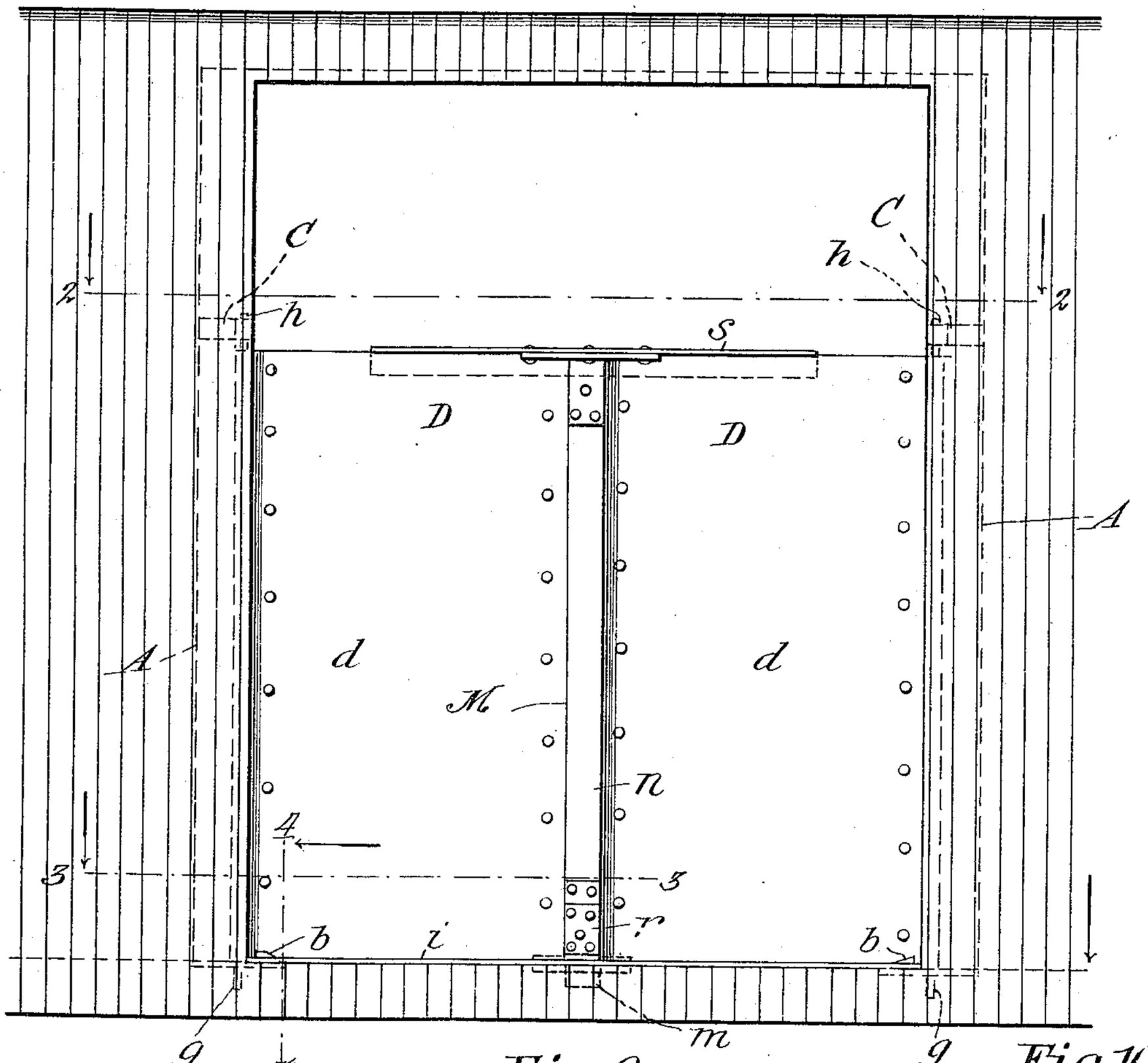


Fig. 9.

Fig. 10.

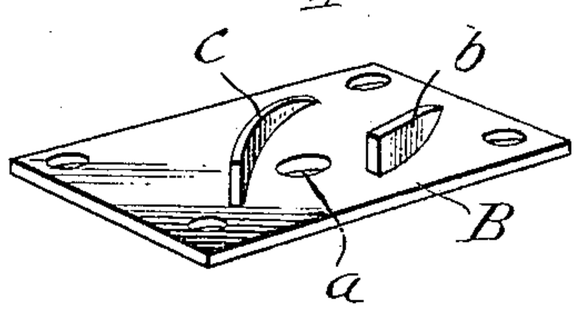


Fig. 8.

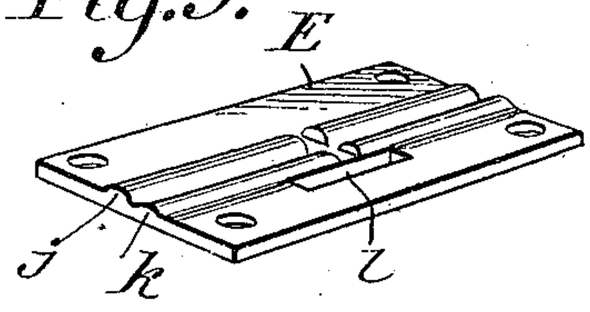
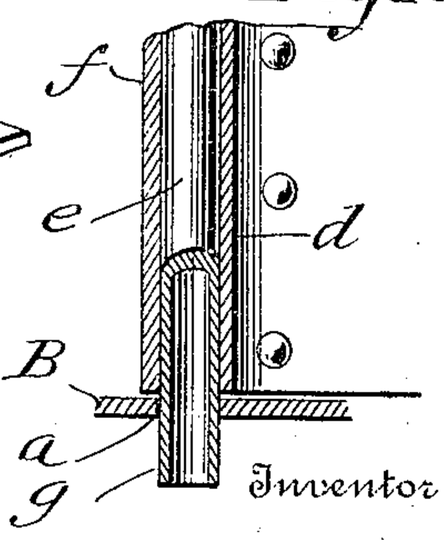


Fig. 12.



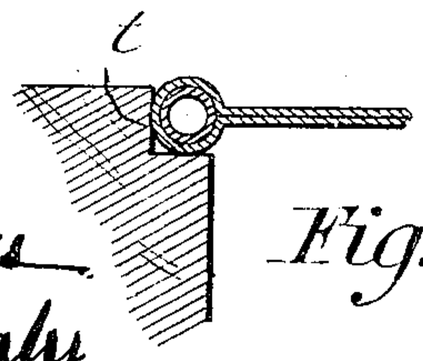
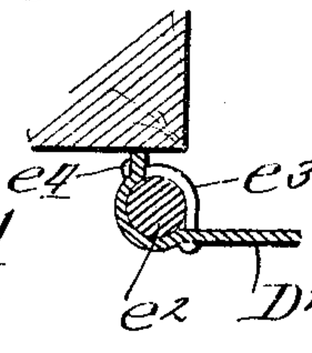


Fig. 11



Witnesses

Phil. E. Barnes.

W. C. Healy

Inventor

John Henry,

By James J. Shuhy & Co,

Attorneys

J. HENRY.

GRAIN DOOR FOR CARS.

APPLICATION FILED JUNE 10, 1910.

993,250.

Patented May 23, 1911.

3 SHEETS—SHEET 2.

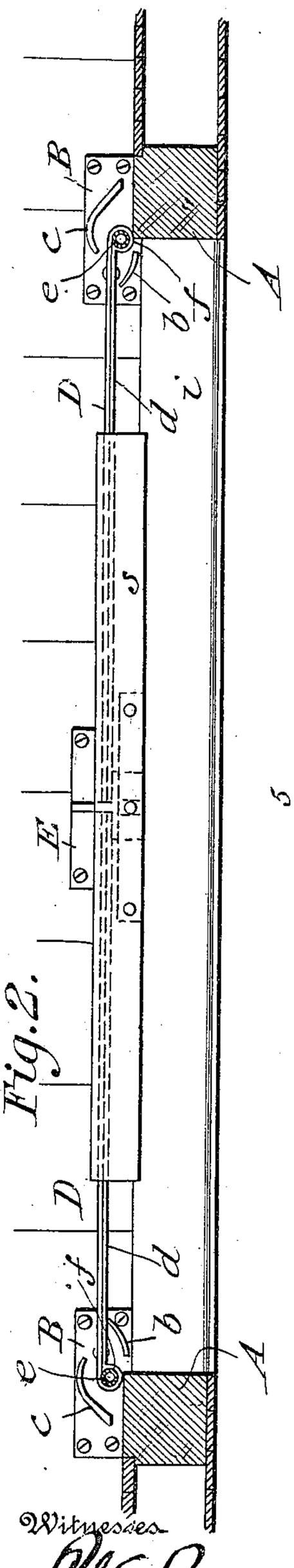


Fig. 2.

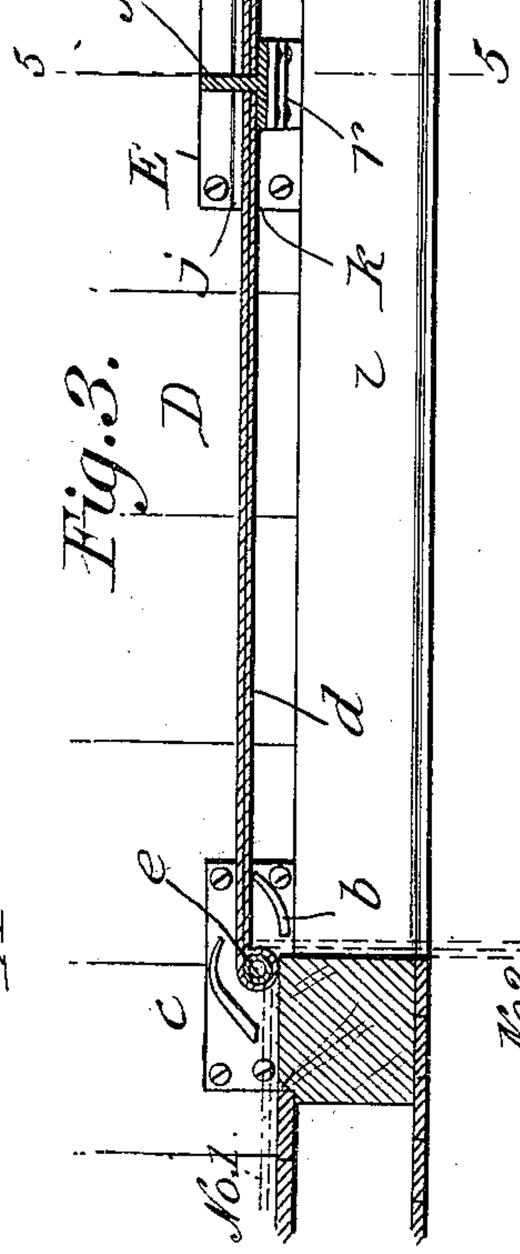


Fig. 3.

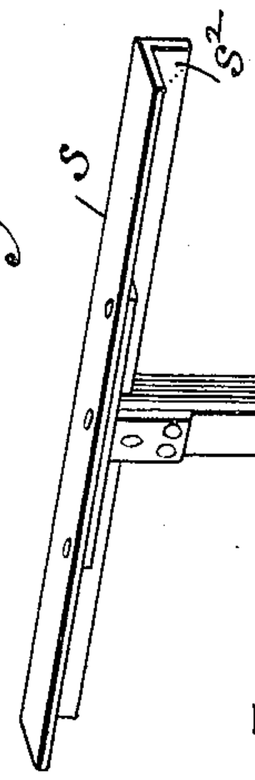


Fig. 6.

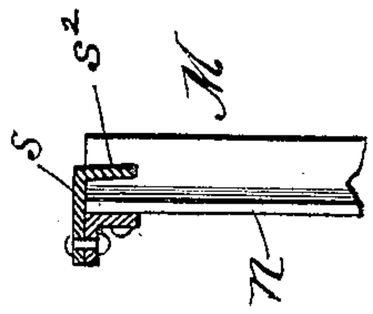


Fig. 7.

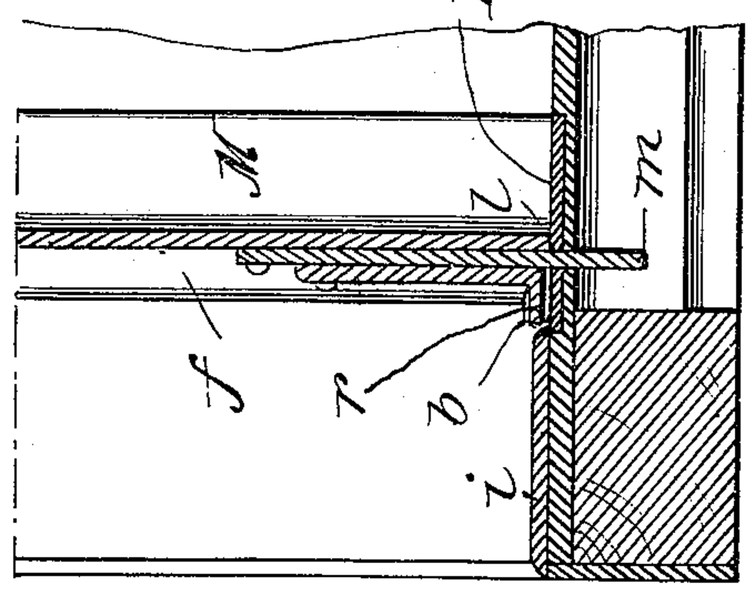


Fig. 5.

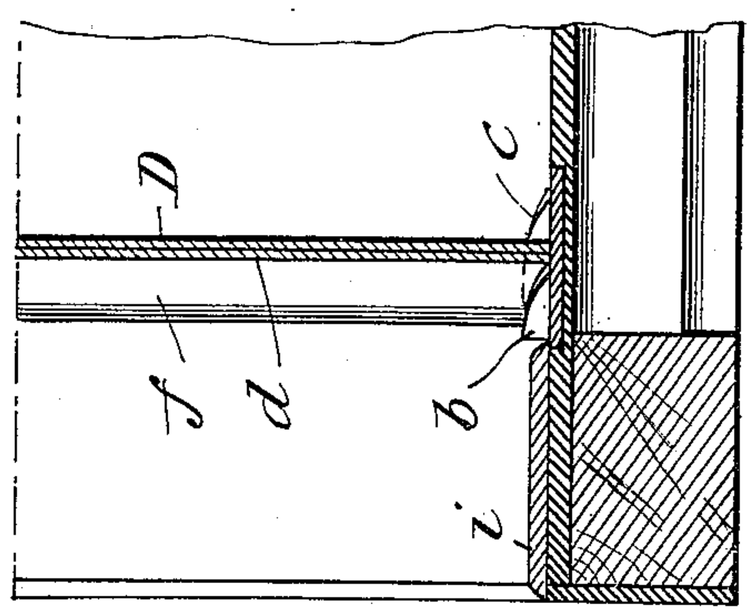


Fig. 4.

Inventor

John Henry,

By

James & Healy & Co.

Attorneys

J. HENRY.

GRAIN DOOR FOR CARS.

APPLICATION FILED JUNE 10, 1910.

993,250.

Patented May 23, 1911.

3 SHEETS—SHEET 3.

Fig. 14.

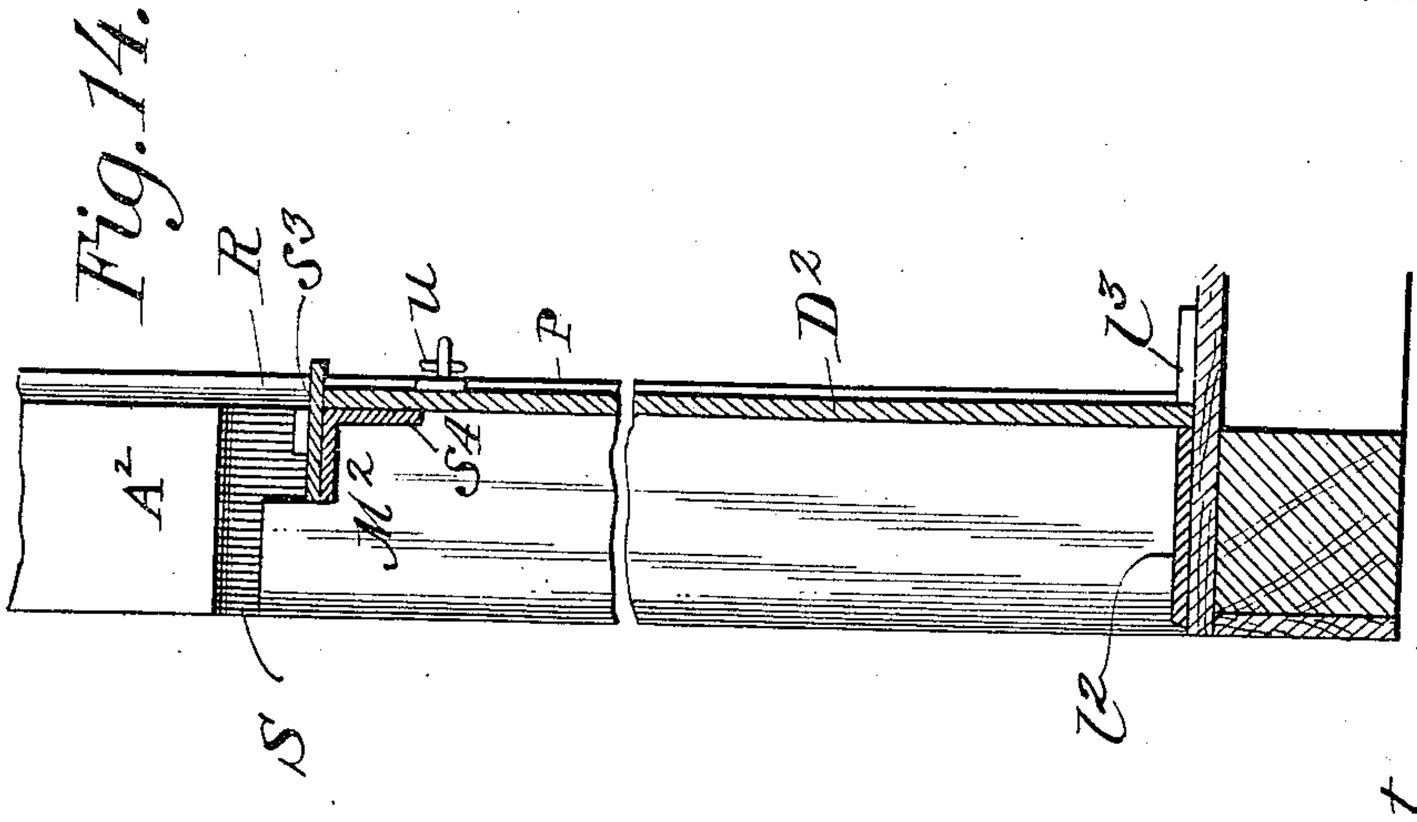


Fig. 15.

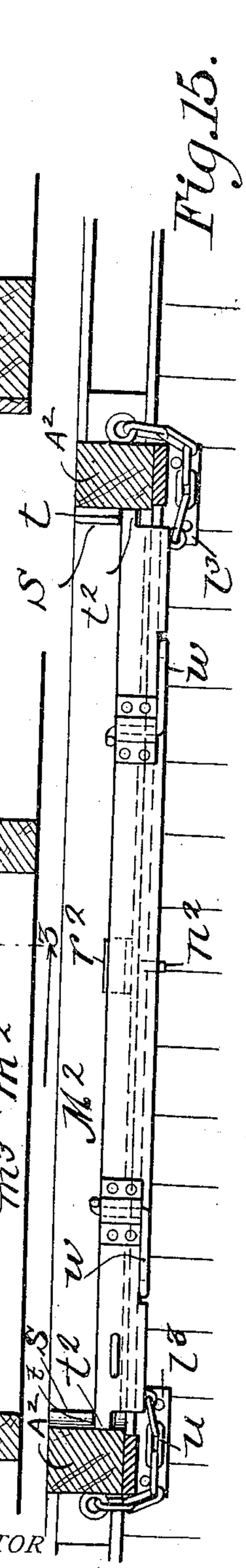


Fig. 15.

WITNESSES

Paul E. Barnes

N. C. Healy

INVENTOR

John Henry,

by James J. Shechy & Co.,

Attorneys

UNITED STATES PATENT OFFICE.

JOHN HENRY, OF GRAND FORKS, NORTH DAKOTA.

GRAIN-DOOR FOR CARS.

993,250. Specification of Letters Patent. Patented May 23, 1911.

Application filed June 10, 1910. Serial No. 566,174.

To all whom it may concern:

Be it known that I, JOHN HENRY, citizen of the United States, residing at Grand Forks, in the county of Grand Forks and State of North Dakota, have invented new and useful Improvements in Grain-Doors for Cars, of which the following is a specification.

My present invention relates to grain doors for cars; and it consists in the peculiar and advantageous combinations and constructions hereinafter described and definitely claimed.

In the drawings, accompanying and forming part of this specification: Figure 1 is a view of a portion of the exterior of a car equipped with one embodiment of my invention and showing the door as closed. Figs. 2 and 3 are horizontal sections taken in the planes indicated by the lines 2—2 and 3—3, respectively, of Fig. 1. Fig. 4 is a detail vertical section taken on line 4—4 of Fig. 1. Fig. 5 is a detail vertical section taken on the line 5—5 of Fig. 3. Fig. 6 is a perspective view of the door fastener. Fig. 7 is a detail vertical section of the same. Fig. 8 is a detail perspective view of one of the fixtures employed under the pivoted ends of the doors. Fig. 9 is a perspective view of the keeper plate to receive the lower end of the fastener and the lower edges of the doors. Fig. 10 is an enlarged detail vertical section of the pivoted end of one door. Figs. 11 and 12 are detail horizontal sections of modifications hereinafter referred to in detail. Fig. 13 is a view of a portion of the interior of a car equipped with a second embodiment of my invention and showing the door as closed. Fig. 14 is a vertical section taken in the plane of line 3—3 of Fig. 13, looking in the direction indicated by arrow. Fig. 15 is a horizontal section taken on the line 2—2 of Fig. 13, looking downward.

Referring by letter to the said drawings, and more particularly to Figs. 1 to 10, thereof: A A are the door posts of a freight car. B B are plates, fixed on the floor of the car, and each having a socket *a* and also having inclined planes *b* and *c*. C C (see dotted lines in Fig. 1) are bearings attached to the posts A in a plane considerably above the car floor, and D D are doors which respectively comprise, by preference, a sheet of steel *d* folded upon itself, and a steel tube *e* arranged in the circular bight *f* of the fold, and having lower and upper extended end portions *g* and *h*, disposed in the sockets *a* and bearings C, respectively. The rounded pivoted ends of the doors, afforded by the said circular bights *f*, rest close against the posts A, and hence make tight joints between the posts and doors, when the latter are in working position, and prevent leakage of substance from the car at the points between the posts and doors, and this without interfering with the swinging capacity of the doors. It will also be observed that the doors are capable of limited vertical movement, and that when swung outward from the closed position shown, they are raised and enabled to clear the sill *i* by the inclined planes *b*, and when they reach the outer ends of the said inclined planes *b* they drop back to the floor of the car and are secured in their fully opened positions between the outer ends of the inclined planes *b* and the opposed sides of the posts A. (See dotted lines No. 1 at the left of Fig. 3.) It will be further observed that the doors will be raised by the inclined planes *c* when swung inward from the position shown, and that when the doors reach the higher ends of the said planes *c* they will drop to the car floor, and hence will be retained between said ends and the inner side of the side wall of the car, where they will be out of the way. See dotted lines No. 2 in Fig. 3.

When in the closed position illustrated the doors D rest on the car floor and on a keeper plate E fixed to and flush with said floor, and also rest between shallow rounded ribs *j* and *k* on the plate E. It will also be noted that the plate E is provided with a socket *l*. This latter is to receive the lower extension *m* of the door fastener M, shown in detail in Figs. 6 and 7. In addition to the said extension *m*, the said fastener M, which is preferably of steel, comprises an upright bar *n*, of T-form in cross-section, a lateral projection *r* and a cap bar *s*, of angular form in cross-section, reaching in opposite directions from the upper end of the bar *n;* all of the said parts being suitably fixed with respect to each other.

When the fastener M is in the position shown in Fig. 1, it serves to effectually prevent outward swinging movement of the doors D, but when said fastener is raised (by a crow-bar placed between projection *r* and plate E) to clear the extension *m* from the socket *l* and to clear the depending

portion s^2 of the cap bar s from the inner sides of the doors, the doors are left free to be opened by the pressure of the substance in the car. It will also be observed that the ribs j and k of the plate E serve to assist the closed fastener M in preventing swinging movement of the doors D either outward or inward.

In Fig. 11, I illustrate that it is feasible to pivot the ends of the doors in recesses t, preferably though not necessarily angular, in the door posts, while Fig. 12 shows another way in which the doors can be made; the door D^2 in said figure being bent around a pivot post e^2 and connected thereto by a clip e^3, and the edge e^4 of the door being arranged to make a tight joint between the door and the post when the door is in working position as shown in Fig. 12, and this without interfering with free swinging of the door.

In Figs. 13 to 15, I show a second complete embodiment of my invention, which is advantageous because of its efficiency and durability and also because of the facility and cheapness with which it may be installed. In the said embodiment strips P are fastened to the inner sides of the door posts A^2 to form rabbets R, and the door posts A^2 are provided in their sides adjacent the door opening with recesses S having notches or reduced portions t, Figs. 14 and 15, acting as keepers.

The doors D^2 of the second embodiment are respectively formed, by preference, of a single sheet of steel and hence are adapted to be readily straightened when knocked out of shape by rough handling. The said doors D^2 are connected with the car body through upper chains u and lower chains v and hence are adapted, like the doors D of Figs. 1–4, to swing from the closed position shown, outward through the door opening and inward to a position against the inner side of the car wall. The lower chains v are detachable from the car body, and consequently when deemed expedient said chains may be connected to the inner side of the side wall of the body, at points remote from the door opening, with a view to holding the doors against said wall and out of the way when the doors are not in use.

When closed, the outer edges of the doors D^2 rest in the rabbets R and the lower edges of the doors rest against the sill l^2, which rabbets R and sill l^2 serve to assist the fastener M^2 in preventing outward movement of the doors under the pressure of grain, coal or other substance carried in bulk in the car body. It will also be noted that when closed the lower edges of the doors rest between the inner edge of the sill l^2 and plates l^3 fixed on the car floor.

The fastener M^2, which is preferably of steel, comprises an upright bar n^2, of T-form in cross-section, a lateral projection r^2 for the same purpose as the projection r of Figs. 1 to 6, an extension m^2 adapted to be placed in a keeper m^3, preferably formed by a socket in the car floor, and a cap bar s^3 of T-form in cross-section, reaching in opposite directions from the upper end of the bar n^2; all of the said parts being fixed with respect to each other. From this it follows that the cap bar s^3 is adapted to rest on the upper edges of the doors D^2, and is provided with the depending portion s^4 adapted to rest at the outer sides of the upper portions of the doors, and effectually prevent outward movement of said upper portions.

The stem of the upright T-bar n^2 rests between the adjacent edges of the doors while the head of said T-bar rests at the outer sides of the said adjacent portions, and hence serves to effectually prevent outward movement thereof. The cap bar s^3 is of a length to extend from one post A^2 to the other, and is provided at its ends with reduced portions t^2 adapted to be removably seated in the reduced depending portions t of the keepers S, and be held against horizontal movement by the same. It will further be observed by comparison of Figs. 13 and 15, that the cap bar s^3 is provided with pivoted and gravitating hooks w, which are adapted when the doors D^2 are closed, to engage the inner sides of the upper portions of the doors and prevent inward movement thereof.

The fastener M^2 is preferably, though not necessarily, connected through a chain W with the car body, this with a view of preventing displacement of the said fastener when the same is not in use.

When the fastener M^2 is raised (as by a crow-bar interposed between projection r^2 and the sill l^2) to clear the extension m^2 from the keeper m^3, and to also clear the ends of the cap bar s^3 from the depending portions of the post keepers S, the doors are left free to be opened by the pressure of the substance in the car; the said doors being slightly raised when necessary to enable them to clear the sill l^2.

While I have completely illustrated and described certain forms of my invention, it is to be understood that I am not limited to the details or the form or relative arrangement of parts disclosed, but that extensive modifications may be made therein without departing from the spirit thereof.

Having described my invention, what I claim and desire to secure by Letters-Patent, is:

1. The combination of door posts, a keeper located intermediate the said posts, horizontally swinging doors movably connected with the posts, and a door fastener having a

portion movable vertically into and out of the keeper and also having a portion, of T-form in horizontal section, arranged with its stem between the edges of the doors and its body at the outer sides of the doors, and a cap bar fixed on the latter portion and having a depending flange arranged at the sides of the doors.

2. In a grain door, the combination of a car body, horizontally swinging grain doors movably connected therewith, and a door fastener movable vertically into and out of engagement with the body and having an upright bar, of T-form in cross-section, the stem of which rests between the adjacent edges of the doors and the head or body of which rests at the outer sides of the adjacent portions of the doors, and also having means for engaging and holding the upper edges of the doors.

3. In a grain door, the combination of a car body having door posts, horizontally swinging grain doors movably connected with the posts and bearing against the same, and a door fastener movable vertically into and out of engagement with the car body and having an upright bar for preventing outward movement of the adjacent edges of the doors and also having a cap bar extending in opposite directions from the upright bar and bearing on the upper edges of the doors and provided with means for engaging and holding the upper edges of the doors.

4. The combination of door posts, a keeper located intermediate the said posts, movable doors, and a door fastener movable vertically into and out of the keeper and having a portion arranged at the outer sides of the doors and also having depending means arranged at the inner sides of the doors.

5. In a grain door, the combination of door posts having keepers, a keeper located intermediate said posts, door sections, and a fastener movable vertically into and out of the keepers in the door posts and the keeper intermediate said posts and having an upright bar for holding the meeting edges of the doors against outward movement.

6. In a grain door, the combination of door posts having keepers, a keeper located intermediate said posts, door sections, and a fastener movable vertically into and out of the keepers in the door posts and the keeper intermediate said posts and having an upright bar for holding the meeting edges of the doors against outward movement, and also having means for engaging and holding the upper edges of the doors.

7. In a grain door, the combination of door posts having keepers, a keeper located intermediate said posts, door sections, and a fastener movable vertically into and out of the keepers in the door posts and the keeper intermediate said posts and having a portion arranged at the outer sides of the doors and also having means for engaging and holding the upper edges of the doors.

8. The combination of door posts, a keeper located intermediate the said posts, movable doors, and a door fastener movable vertically into and out of the keeper and having a portion arranged at the outer sides of the doors and also having means for engaging and holding the upper edges of the doors.

9. The combination of door posts, movable doors the outer portions of which bear outward against the posts, and a door fastener having an upright portion, of T-form in horizontal section, arranged with its stem between the edges of the doors and its body at the outer sides of the doors and with its lower end held against outward movement, and means extending laterally in opposite directions from said upright portion, for engaging the upper portions of the doors.

10. The combination of a car body having a door opening and door posts, movable doors the outer portions of which bear outwardly against the posts, and a door fastener having a bar supported by the posts for preventing outward movement of the upper portions of the doors, and also having means disposed at the outer sides of and supporting the inner edge portions of the doors.

11. The combination of a car body having a door opening and door posts and also having a keeper located intermediate the said posts, movable doors, and door fastening means comprising a bar movable vertically into and out of the keeper and having a portion arranged at the outer sides of the doors, and a bar supported by the posts and arranged at the outer sides of the upper portions of the doors.

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

JOHN HENRY.

Witnesses:
N. C. HEALY,
T. E. TURBIN.