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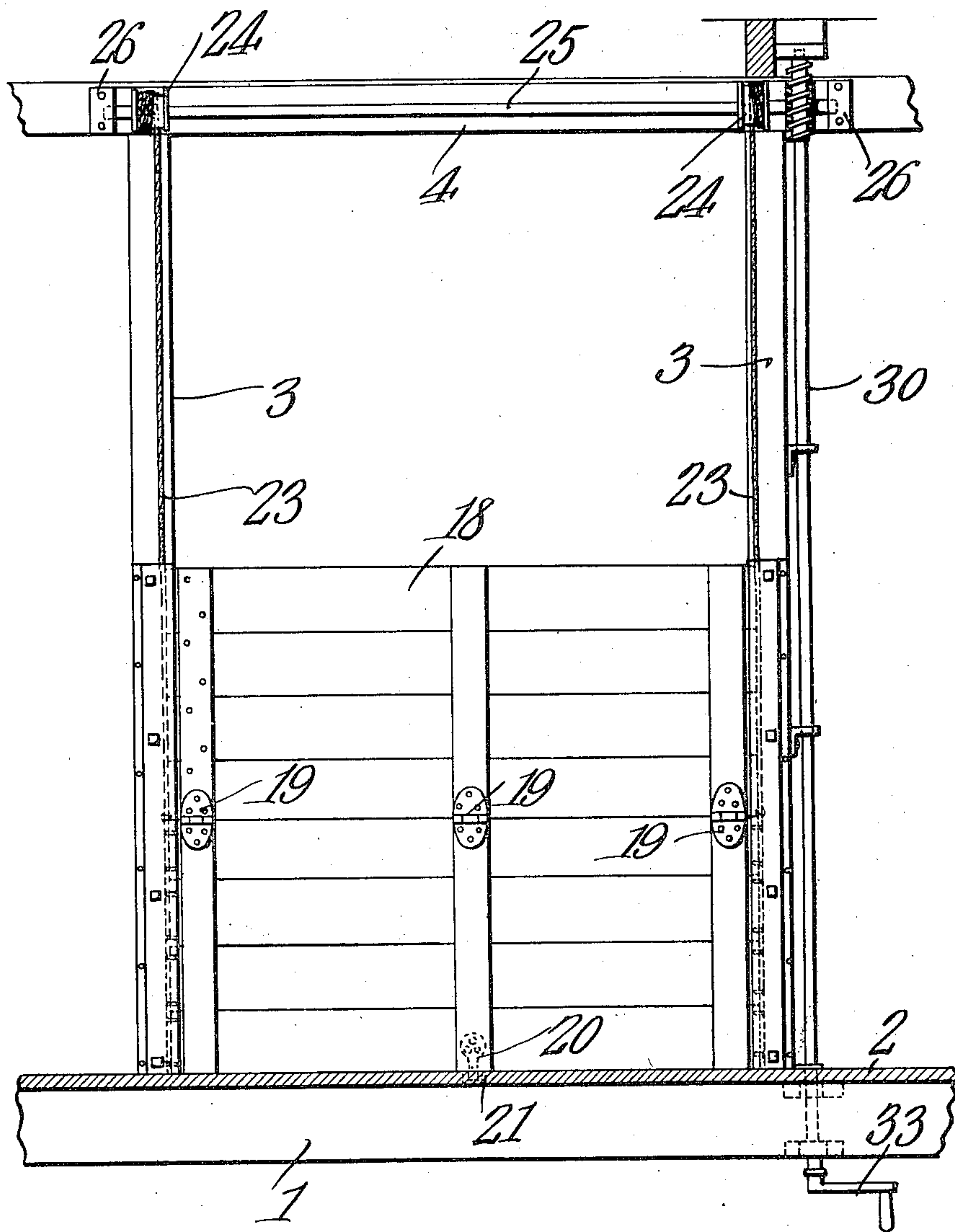
PATENTED MAY 5, 1908.

J. C. MARXEN & J. H. WOODWARD.
GRAIN DOOR FOR RAILWAY CARS.

APPLICATION FILED JUNE 8, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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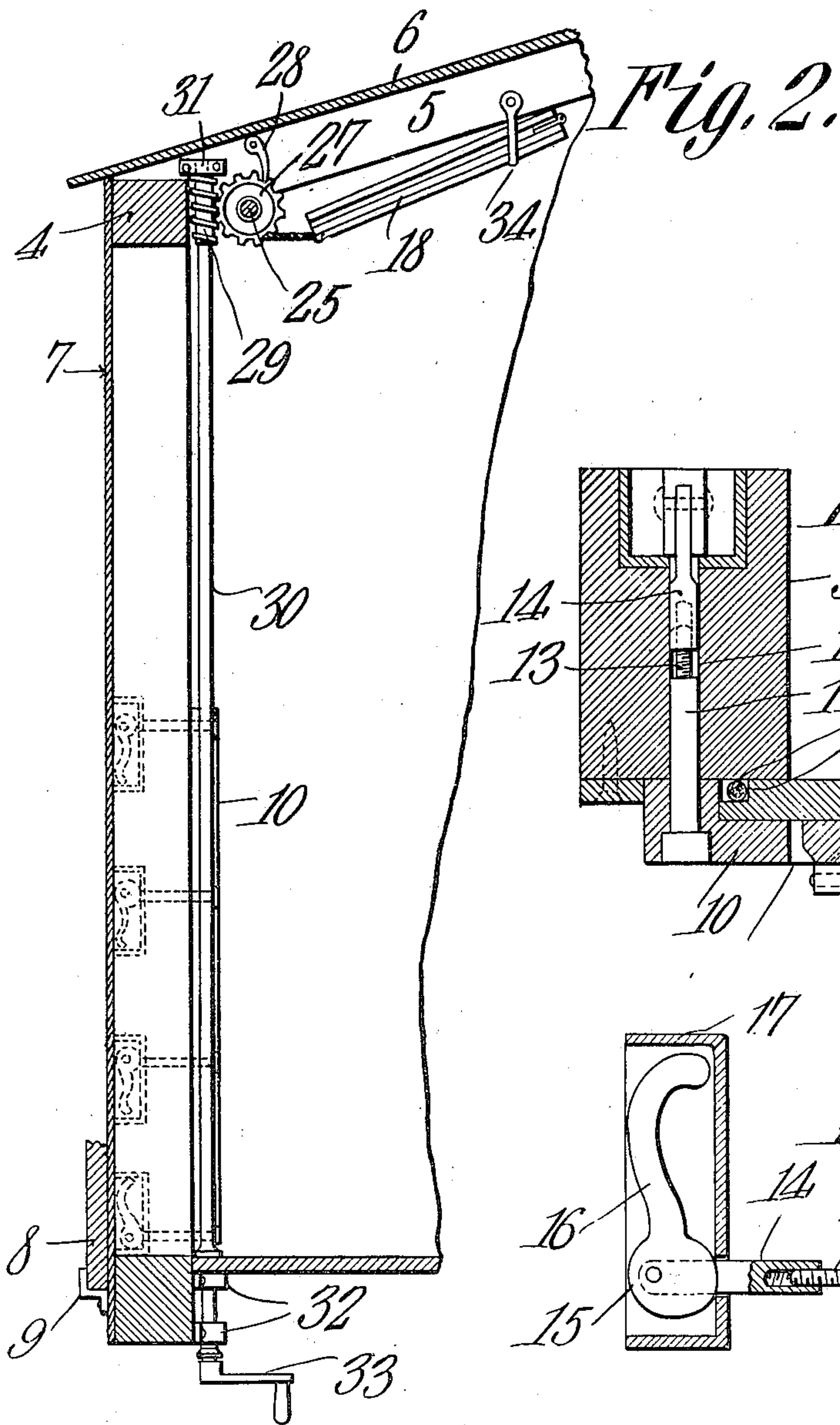
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UNITED STATES PATENT OFFICE.

JOHN C. MARXEN AND JOHN H. WOODWARD, OF AVOCA, IOWA.

GRAIN-DOOR FOR RAILWAY-CARS.

No. 886,529.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed June 8, 1907. Serial No. 377,977.

To all whom it may concern:

Be it known that we, JOHN C. MARXEN and JOHN H. WOODWARD, citizens of the United States, residing at Avoca, in the county of Pottawattamie, State of Iowa, have invented a new and useful Grain-Door for Railway-Cars, of which the following is a specification.

This invention has reference to improvements in grain doors for freight cars, although adaptable to other purposes where closeness of fit is desirable.

It is customary to ship grain in bulk, and it is usual to provide an inside door for the cars in addition to the outside or sliding doors. However, no provision is made whereby these grain doors are made to fit snugly around the edges of the opening, and much grain is lost in transit by seepage through the ill-fitting junction of the doors with the car frame surrounding the opening.

It is the object of the present invention to provide means whereby a tight fit may be obtained between the door and the side posts and sill, so that the escape of grain is made impossible and still the door may be easily moved when it is desired to leave the opening free.

The invention comprises means for guiding the grain door along the side posts and for so tightening these guiding means as to press the sides of the door into close relation with the side posts. These compression means are arranged to be operated from the outside of the car, and provision is made for taking up any slack that may occur because of the shrinkage of the side posts or other parts of the structure.

The invention will be fully understood from the following detailed description, taken in connection with the accompanying drawings forming part of this specification, in which,—

Figure 1 is a rear view of the grain door in place, as seen from the inside of the car; Fig. 2 is a cross section through one side of the car at one side of the opening; and Figs. 3 and 4 are detail views showing the means for clamping the grain door against the side posts bordering the opening in the car.

In the drawing there is shown a portion 1 of one of the sills of a car and a portion 2 of the floor thereof. There are also shown side posts 3 bordering the usual opening in the side of the car, and the plate 4 determining

the top of the opening and supporting the rafters 5 upon which is laid the roof 6.

In Fig. 2 the siding 7 of the car is also shown, and in this same figure a small portion 8 of the usual outside sliding door is shown, with the bottom guideway 9.

Fast to the inner side of each post 3 on each side of the opening is a rabbet strip 10. The fastening devices are shown more clearly in Figs. 3 and 4. Referring to these figures, there is shown a headed bolt 11 with the head countersunk into the rabbet strip 10 and the shank extending into a through perforation 12 in the corresponding post 3.

At the end of the bolt 11 remote from the head thereof is a reduced threaded stem 13 entering a nut formed in a connecting rod 14 having the end remote from the nut flattened and pivoted between the branches of the bifurcated end 15 of a cam lever 16, which latter is housed in a boxing 17 sunk into the outer face of the corresponding post 3. There will be a number of these cam levers 16 with their connections, depending on the length of the rabbet strips 10, and in practice three or four of these cam structures will usually be sufficient for the purpose. These cam levers are accessible from the outside of the car, but when the door 8 is moved to close the opening in the side of the car this door will cover the cam levers and thereby protect them from being maliciously tampered with and from accidental displacement under the exigencies of transportation.

The rabbet strips 10 constitute the guides for the edges of a grain door 18, made of two parts joined in the middle by hinges 19, so that the door is hinged on a lateral plane. At the bottom of the outside of the door is a central pin 20 projecting downward below the bottom of the door into a socket 21 in the flooring 2 or sill 1, as the case may be. The side edges of the door are rabbeted, as shown at 22, Fig. 3, for the passage of a rope, chain or cable 23 secured in any suitable manner to the lower section of the door 18. There are two ropes or cables 23, one for each side of the door, and these extend upward to respective winding drums 24 on a horizontal shaft 25 journaled in brackets 26 fast on the plate 4. At one end, beyond the corresponding drum 24, the shaft carries a worm pinion 27 engaged by a pawl 28 and also engaged by a worm 29 on the upper end of an upright shaft 30 journaled in a bracket 31 at the top

of the car and extending downward through the bottom of the car, where it is provided with other journal bearings 32 and terminates in a crank handle 33. The handle 33 is within easy reach of a person outside the car and through this crank the shaft 30 may be rotated in the appropriate direction to cause the rotation of the shaft 25 through the worm 29 and worm pinion 27 to wind up the ropes 23 and thus lift the door toward the plate 4. Ultimately, the door is lifted free from the rabbet guide strips 10, and it may then be folded on itself because of the hinges 19 and hung from the roof of the car by means of a suitable support 34, shown in Fig. 2. The shaft 25 is held against accidental rotation by means of the pawl 28.

Now, let it be supposed that the car is to be loaded with grain. The door 18 is lowered into place between the strips 10 and the posts 3, the cam levers 16 having been first moved to loosen the strips 10 so that the door may be easily moved into its lowered position. When it reaches its lowermost position the pin 20 is seated in the socket 21. Now, by moving the cam levers 16 into the pockets 17 the strips 10 are brought into close clamping relation with the side edges of the door 18 and the latter is most effectually locked against accidental displacement and the junction between this door and the side posts is made so tight that there is no possibility of any grain whatsoever escaping past the sides or bottom of the door. By closing the outside door 8 and suitably locking it as is customary the grain door is held against manipulation or accidental displacement. Now, should the side posts 3 or the strips 10 shrink this may be compensated for by screwing the bolt 11 to a greater extent into the nut formed in the part 14, and thus the grain door may be always maintained in tight relation to the side posts 3 when so desired.

While we have described this door as particularly adapted for use as a grain door for railroad cars, it is to be observed that it may be used for other purposes, wherever it is desirable that the door be firmly clamped in place.

We claim:—

1. A car having a side opening, side posts bordering said opening, rabbeted guide strips

on the inner faces of said posts, a vertically movable door having its edges seated in the rabbets in said guide strips, bolts having heads countersunk in said guide strips and extending through the guide strips and through the side posts of the door opening to the exterior thereof, and means for tensioning said bolts to cause the guide strips to engage those portions of the door seated in the rabbets and to clamp them against the side posts of the door opening.

2. A car having a side opening, side posts bordering said opening, rabbeted guide strips on the inner faces of the side posts, a vertically movable door having its edges seated in the rabbets in said guide strips, bolts having heads engaging said guide strips and extending therethrough and through the side posts of the door opening to the exterior thereof, cam levers attached to said bolts exterior to the car, and pockets for said cam levers countersunk into the side posts and also constituting wearing plates for the cam levers to house the latter when in position to strain the bolts.

3. A grain door for railway cars, comprising a vertically movable door, guide strips for the sides thereof, bolts supporting said guide strips and extending through the posts bordering the opening in the car, said bolts being formed of two parts with an adjustable screw connection between them housed in the side posts of the door opening, and cam levers carried by the outer ends of said bolts for tensioning the bolts.

4. A grain door for railway cars, comprising a vertically movable door, guide strips for the sides thereof, bolts supporting said guide strips and extending through the posts bordering the opening in the car, said bolts being formed of two parts with a screw connection between them, cam levers engaging the outer ends of said bolts, and pockets in said posts and housing said levers.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

JOHN C. MARXEN.
JOHN H. WOODWARD.

Witnesses:

A. C. MEITZEN,
E. J. KARSTENS.