March 18, 1924. 1,487,278

E. C. SHORT

GRAIN DOOR

Filed Dec. 4, 1922

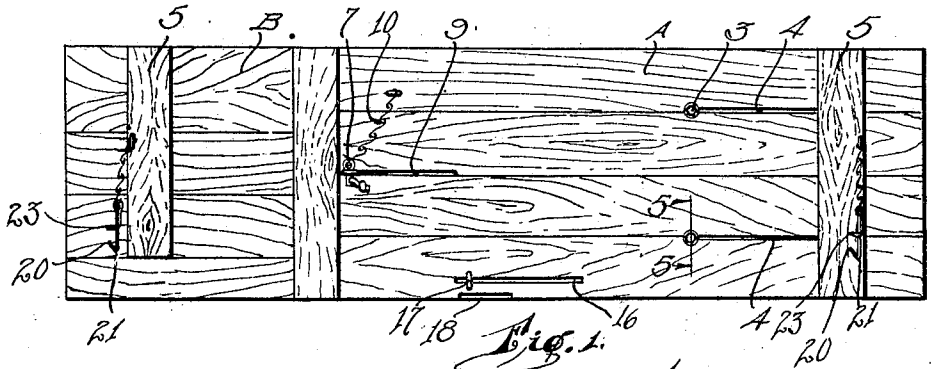


Fig. 1.

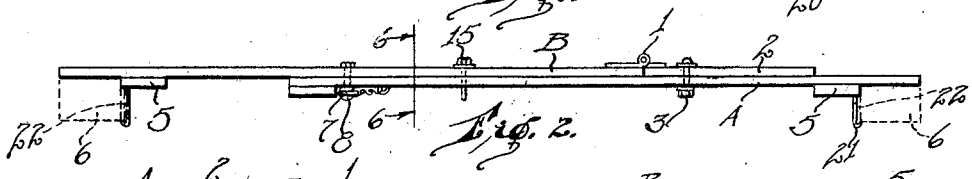


Fig. 2.

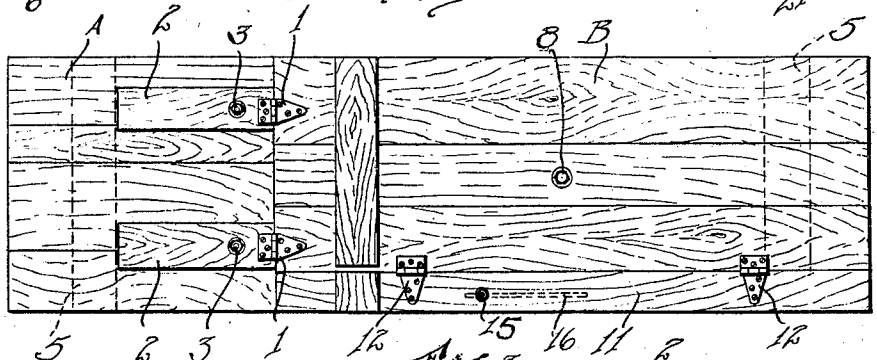


Fig. 3.

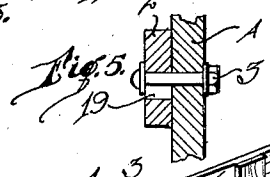


Fig. 5.



Fig. 4.



Fig. 6.

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# UNITED STATES PATENT OFFICE.

EDGAR CLARK SHORT, OF ST. PAUL, MINNESOTA.

## GRAIN DOOR.

Application filed December 4, 1922. Serial No. 604,817.

*To all whom it may concern:*

Be it known that I, EDGAR CLARK SHORT, a citizen of the United States, and a resident of St. Paul, in the county of Ramsey and State of Minnesota, have invented a new and useful Improvement in Grain Doors, of which the following is a full, clear, and exact description.

My invention relates to improvements in grain doors, and it consists in the combinations, constructions, and arrangements herein described and claimed.

The ordinary type of grain door consists of a number of boards nailed to each other so as to provide a door approximately two feet high. Three of these doors are used in the ordinary freight car and are nailed to the door frame on the inside of the car. When unloading a car having this type of door, the first operation is to remove the bottom door to permit the grain to flow out. After the grain pressure is removed from behind these doors, all of the doors are knocked off. The bottom door or lower section in the completed door is so securely fastened to the freight car that often the door is ruined by the prying tool which removes the door from the car. The door then has to be discarded or repaired before it can be used again. It is obvious that the damage to these bottom doors becomes a formidable item of expense.

The principal object of my invention is to provide a door which may be removed readily and without damage to the door.

A further object of my invention is to provide a door of the type described which does not have to be reassembled when used again.

A further object of my invention is to provide a device of the type described which may be readily applied to railroad cars without any alterations being necessary in the latter.

A further object of my invention is to provide a device of the type described which is extensible, whereby it can be adjusted to fit doors of various sizes.

A further object of my invention is to provide a device of the type described in which the door is more firmly locked in place when a greater weight is applied thereto, in other words, the greater the weight of the grain within the car, the more firmly the door is locked in place.

A further object of my invention is to provide a device of the type described in which all of the fastening means are accessible from the exterior of the car.

A further object of my invention is to provide a device of the type described which is simple in construction, durable and efficient for the purpose intended, and which is not likely easily to get out of order.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming part of this application, in which

Figure 1 is a side elevation of the exterior side of the door,

Figure 2 is a top plan view of Figure 1,

Figure 3 is a side elevation looking at the interior side of the door,

Figure 4 is a perspective view showing the door in opened position,

Figure 5 is a section along the line 5—5 of Figure 1 and

Figure 6 is a section along the line 6—6 of Figure 2.

In carrying out my invention I provide an outer frame A and an inner frame B. It will be noted from Figure 3 that the frame A is secured to the frame B by hinges 1, these hinges being secured to the frame B and being secured to blocks 2 which in turn are secured to the frame A by bolts 3. The frame B has slots 4 therein in which the bolts 3 are slidably disposed. It will therefore be apparent from this construction that the frame A may be moved with respect to the frame B and then locked in place by bolts 3, whereby the door may be lengthened or shortened so as to fit the freight car door to which it is applied. In Figure 1 I have shown the door in its extended position.

The frames A and B are provided with vertically extending cleats 5 which are adapted to abut the vertically extending posts 6 of the door frame. The portions of the frames A and B which extend beyond the cleats 5 are adapted to engage with the inner side of the posts 6. The frames A and B are removably locked together by means of a pin 7 which is adapted to enter an eyelet 8. The eyelet 8 is carried by the frame B and is received within a slot 9 when the frames A and B are swung into alignment with each other. The pin 7 is carried by a

chain 10 which is secured to the frame A.

In Figure 3 I have shown the frame B as being provided with a hinged board 11, this board being secured to the frame B by means of hinges 12. In some of the freight cars the sill is provided with a plate 13, (see Figure 6,) which has a hump 14 positioned approximately in the middle of the plate. When the door is in closed position, the hinged board 11 is adapted to abut the hump 14. The board 11 is locked to the frame A by means of a pin 15. The pin 15 is adapted to enter the slot 16 in the frame when the frames A and B are brought into engagement with each other. An actuating handle 17 of the pin 15 is flat, and when swung into a horizontal position, is adapted to move through the slot 16 but when swung through an angle of 90 degrees is not adapted to move through the slot 16. In securing the board 11 to the frame A, the handle 17 is swung into a horizontal position and then moved through the slot 16, whereupon the handle is swung through an arc of 90 degrees, which will lock the pin to the frame A and thus prevent the board 11 from swinging away from the frame A. The frame A has a slot 18 in the bottom edge thereof which is adapted to receive the hump 14 of the sill plate 13.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. In assembling the door to a freight car, the frames A and B are moved with respect to each other so as to extend the door to the desired length. The frames A and B are moved into the position shown in Figure 4. The ends of the frames A and B which are disposed adjacent to the cleats 5 are positioned behind the door posts 6, or in other words, the door is placed in the interior of the car. The two frames A and B are now swung into abutting engagement with each other. This movement causes the cleats 5 to engage with the posts 6. The tightened bolts prevent the movement of the frames A and B with respect to each other during this operation. It will be seen from this construction that a great lateral pressure will be exerted by the cleats 5 against the posts 6, whereby the door is firmly held in closed position. The grain on the interior of the car bears against the frame B and tends to move the frame outwardly about the hinges 1. This movement is prevented by the pin 7 which is inserted in the eyelet 8, the eyelet in turn being carried by the frame B.

The bolts 3 are disposed in vertical slots 19 in the members 2. This construction permits the frame B to be moved downwardly with respect to the frame A. When the door is to be used on a car having sill plates, the frame B is set a quarter of an inch lower than the frame A. The grain door is then wedged into position as heretofore stated and then forced down the necessary quarter of an inch so that the rear section, i. e., section B, rests on the floor and behind the sill plate. The board 11 is swung into abutting engagement with the frame A. The operator can now turn the handle 17 so as to lock the board 11 in position. The entire under edge of the frames A and B engages with the sill plate 13 so as to prevent any leakage of grain beneath the door. The door is fastened in position by means of hooks 20. The hooks 20 have a hook portion 21 which is adapted to engage with the edge of the vertical door plates 22, whereby the door is prevented from moving inwardly. In case the plates 22 are not provided in the car, the spike portion 23 of the hook 20 is driven into the posts 6. In this manner the door is securely held in closed position by means of the hooks 20.

In removing the door from the freight car the hooks 20 are first removed from the posts 6 and then the pin 15 is turned and the pin 7 is removed from the eyelet 8, whereby the weight of the grain within the car will force the door into the position shown in Figure 4. The door may now be readily removed so as to permit the grain to flow from the car. It is obvious that the doors have not been damaged in the slightest degree. The door does not have to be pried open as is the case with the ordinary freight car doors. The device is very simple in construction and is durable and efficient for the purpose intended. As heretofore described, the device is adapted for universal use, since it can be applied to any type of freight car which has doors of various sizes.

I claim:

1. A grain door comprising two normally overlapping sections, hinges for positively connecting the end of one of said sections with the other section, means for shifting the hinged connection so as to adjust the effective length of the overlapped sections to fit car door frames of different sizes, and means for locking the sections in parallelism in any of the adjusted positions.

2. A grain door comprising two normally overlapping sections, a cleat carried by each section near the end thereof and arranged to engage the frame of a car door, a slidable member carried by one section, means for rigidly securing said slidable member in adjusted position, a hinge positively connecting said slidable member with the other section, and means for locking the sections in parallelism in any of the adjusted positions.

3. A door comprising two sections hinged together, said sections being adjustably secured to each other so as to permit a door to fit door frames of various sized openings, a hinged board carried by one of said sec-

tions and being adapted to drop behind a hump in the sill plate of the door frame, the other section having a recess in its lower edge adapted to receive the hump.

4. A door comprising two sections adjustably hinged together, whereby said door can be lengthened to fit various sized door frames, said sections overlapping each other when in closed position, means for removably locking said sections together, a hinged lower board carried by one section, the other section having a recess therein adapted to align with said board, and means for fastening said door to the door frame.

5. A door comprising two sections adjustably hinged together, whereby said door can be lengthened to fit various sized door frames, said sections overlapping each other when in closed position, means for removably locking said sections together, a hinged lower board carried by one section, the other section having a recess therein adapted to align with said board, means for fastening said door to the door frame, said locking and fastening means being disposed on the outer side of said door, whereby the door can be readily locked and unlocked from the outside of the car to which the door is attached.

EDGAR CLARK SHORT.