







# UNITED STATES PATENT OFFICE.

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## GRAIN-DOOR.

No. 869,412.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, HENRY H. BOENKER, a citizen of the United States, residing at St. Charles, in the county of St. Charles and State of Missouri, have invented certain new and useful Improvements in Grain-Doors, of which the following is a specification.

The purpose of the present invention is to devise a door which may be readily adapted to cars employed for transporting grain and which will prevent escape of grain, and admit of controlling discharge of the grain when unloading the car, and which door may be folded out of the way when the car is empty.

A further purpose of the invention is the provision of a grain door which is adjustable and which has permanent and positive connection with the car so as to prevent its loss or misplacement.

Other objects and advantages will be apparent as the nature of the invention is known and for this purpose reference is to be had to the accompanying drawings and the appended description.

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

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a side view of a portion of a grain car provided with a grain door embodying the invention. Fig. 2 is a horizontal section on the line 2—2 of Fig. 1. Fig. 3 is a transverse section on the line 3—3 of Fig. 1, the full lines showing the door closed and the dotted lines indicating the position of the door and hanger when folded beneath the roof of the car. Fig. 4 is a view similar to Fig. 2, indicating the position of the plates when the wings are moved away from the plane of the door at their outer ends. Fig. 5 is a detail perspective view of a portion of the door, showing the means for adjustably connecting the wings thereto. Fig. 6 is a detail perspective view of the T-bolt and hand nut, by means of which the wings are drawn into operative position and secured. Fig. 7 is a modification.

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 door 1 is provided with one or two wings 2 which are adjustable to increase the width of the door and which are pivoted to admit of swinging movement of the wing or wings when placing the door in position or removing the same to admit of discharge of the grain. It will be understood that the door is both extensible and composed of pivoted parts which admit of either contraction or expansion of the door according as it is

to clear the door opening or to make engagement with the jambs of said door opening, as when placing the door in position. The parts of the door may be constructed either of metal or wood or a combination of both. The door 1 is of a less width than the door opening 3 to admit of placing the door in position or admit of its release when it is required to discharge the load. In the preferable construction, the door is provided at each end with a wing 2, each wing being mounted in a like manner and provided with similar coöperating parts. The door is strengthened near each end by means of vertically arranged cleats 4 and the wings 2 are similarly strengthened near their outer ends by cleats 5. The cleats 4 and 5 may be either of wood or metal, the latter being preferred and consisting of angle bars. Each wing 2 is pivoted at its inner edge to the door and is adapted to swing at its outer edge towards and from the plane of the door. In order to admit of the width of the door being varied to suit the width of the door opening 3, one or both wings 2 are adjustable. Upper and lower flanges 6 project laterally from the inner side of the door 1 and are provided with a series of openings 2. The pintles 8 of the wings 2 are adapted to be withdrawn from the door and inserted in selected openings 7 according to the adjusted position of the wings. It is to be understood that when the outer edges of the wings 2 are moved away from the plane of the door 1, the latter is reduced in width, thereby admitting of its passing easily between the jambs 9 of the door opening. When the outer edges of the wings are drawn towards the plane of the door so as to bring the wings and door in parallel relation, the effective width of the door is increased. Grooves 10 are provided in the inner sides of the door jambs 9 and receive the outer edges of the wings 2 and prevent either inward or outward displacement of the door when the same is properly adjusted to close the door opening and the wings 2 secured. The door jambs are reinforced by metal strips 11 secured thereto, said strips being of angle formation and embracing the inner corners of the jambs 9. The wings of the reinforcing strips 11 facing the door opening 3, are provided with slots corresponding with the grooves 10 and adapted to receive the outer edges of the wings 2.

Any suitable means may be employed to effect positive movement of the wings 2 and secure the same in an adjusted position. As shown, T-bolts 12 have pivotal connection with the outer portion of the wings 2 and their stems pass through openings of the door or a brace 13 secured to said door. Hand nuts 14 are mounted upon the threaded ends of the T-bolts and when screwed home thereon draw the outer portions of the wings towards the plane of the door. When the hand nuts are backed upon the T-bolts, the outer portions of the wings are permitted to swing away from the plane of the door, thereby admitting of the effective width of the door decreasing to permit of its free passage



between the door jambs 9. When placing the door in position, it is moved to bring the outer edges of the wings 2 opposite to the grooves 10, after which the hand nuts 14 are screwed home upon the T-bolts, thereby drawing the outer portions of the wings towards the plane of the door and at the same time causing the outer edges of the wings to enter the grooves 10, with the result that the door is made secure both as against outward or inward displacement. To discharge the load, the hand nuts 14 are backed upon the T-bolts, thereby permitting the door to move outward until the wings 2 finally clear the grooves of the door jambs, when the door will swing outward and permit complete discharge of the grain or other commodity stored in the car for transportation.

To prevent loss or misplacement of the door and to provide convenient means for holding the same out of the way, the means substantially as shown have been devised, the same consisting of a cross rod 15, the hangers 16 and links 17. The rod 15 is of a length to extend across the door opening 3 and engage with the inner sides of the door jambs 9, thereby limiting the outward movement of the upper portion of the door, with the result that the discharge of the grain or other commodity may be better controlled. The links 17 have pivotal connection with the said rod 15 and the door, and admitting of the door swinging outward through the door opening as well as folding upon the hangers 16. The hangers 16 are connected at their lower ends to the rod 15 in a way to prevent relative outward movement, whereas their upper ends are pivotally connected to the upper portion of the car to admit of the hangers and car door folding upward against the roof of the car. When the car is empty and the grain door is not required for immediate use, it is folded upon the hangers and swung upward against the roof of the car and secured in the elevated position by hooks 18 pivoted to cross pieces or rafters of the roof and engaging with end portions of the rod 15.

From the foregoing, it will be understood that the width of the car door may be varied to suit the width of the door opening, it being necessary only to shift the pintles 8 from one set of openings 7 to another to cause one or both wings to project a greater or less distance from the outer edges of the door. It will also be understood that when the door is in position, the outer edges of the wings 2 obtain a snug fit within the grooves 10,

thereby preventing any waste of grain or other article with which the car may be loaded. When it is required to unload the car, the door is loosened and permitted to swing outward under stress of the load by backing or loosening the hand nuts 14, the door being forced outward as the hand nuts 14 are loosened, until finally one or both wings clear the door jambs, when the door will spring outward and admit of complete discharge of the load, as will be readily comprehended.

In some instances it may be advisable to provide for extending the height of the door, especially when the upper portion of the car is to be loaded. In the construction shown in Fig. 7, the hanger 16 is pivotally connected to the inner side of the door jamb 9 and the latter is notched at 19 to receive the end of the cross rod 15 with the result that the upper portion of the door jamb upon the inner side is unobstructed when the door is closed so that one or more boards may be placed across the doorway above the door and secured to the door jambs in the usual manner. As shown in Fig. 7, the metal strips 11 are closed at their upper ends, thereby preventing vertical displacement of the door after the outer ends of the wings 2 have been pressed into the space formed by said strips.

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

1. In a device of the character described, the combination of a door, lateral flanges carried by the door, a wing adjustably hinged between the lateral flanges, and means for locking the wing in alinement with the door.
2. In a device of the character described, the combination of grooved door jambs, a door, lateral flanges carried by the door, wings adjustably hinged between the flanges, bolts loosely connected to the wings and extending through the door, and nuts cooperating with the bolts to draw the wings into alinement with the door.
3. In a device of the character described, the combination of door jambs, a door, adjustably mounted wings carried by the door for engaging the jambs, a cross rod designed to engage the jambs, link members loosely connecting the upper edge of the door and the cross rod, and hangers connecting the cross rod and the top of the car, the door being designed to be folded against the upper portion of the hangers and swung against the top of the car, and fastening members for holding the door against the top of the car.

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

HENRY H. BOENKER. [L. S.]

Witnesses:

HUGO BODE.

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