C. W. & A. BASH.

GRAIN CAR DOOR.

APPLICATION FILED NOV. 14, 1912.

1,140,100.

Patented May 18, 1915.

2 SHEETS—SHEET 1.

Fig. I.

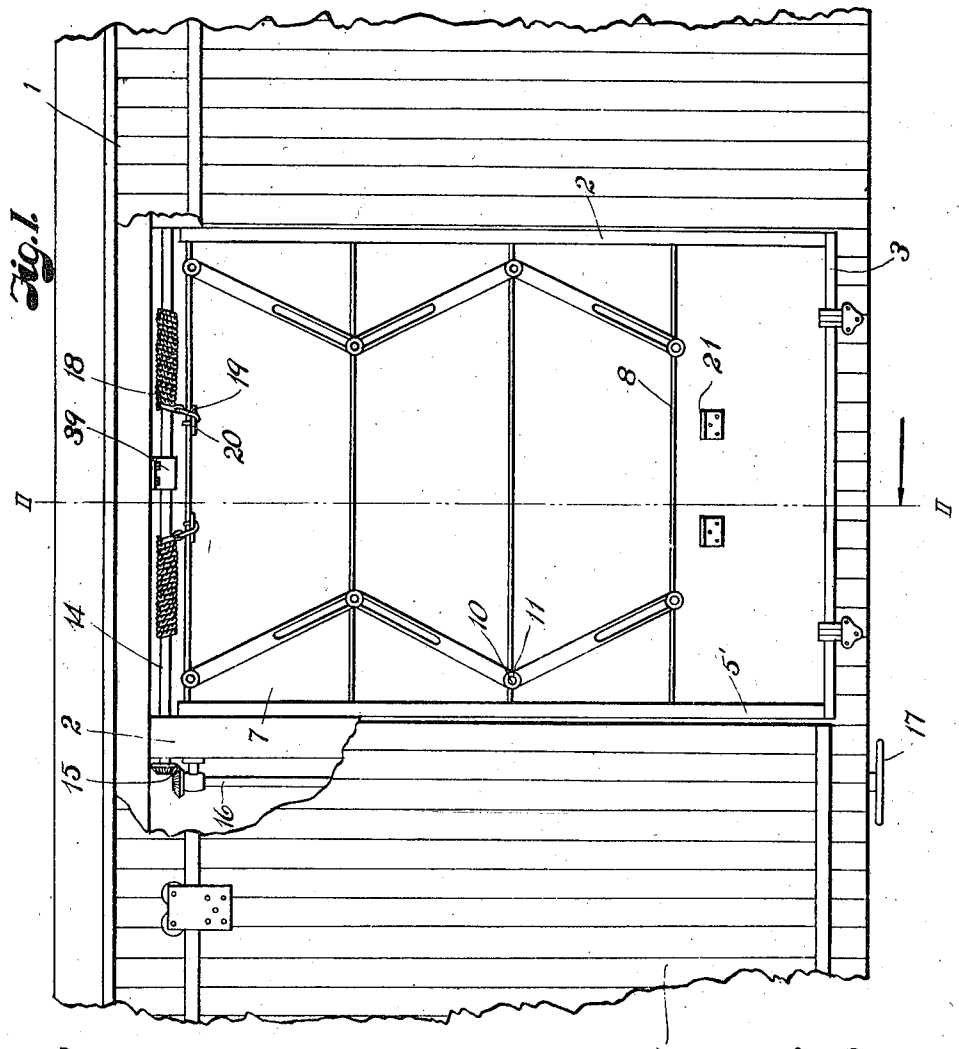
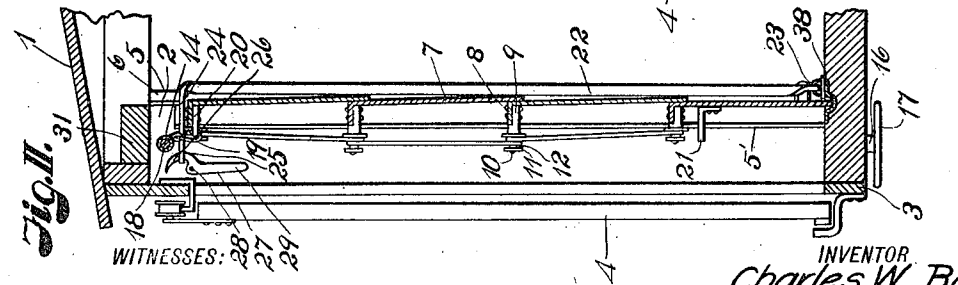


Fig. II.



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2 SHEETS—SHEET 2.

Fig. III.

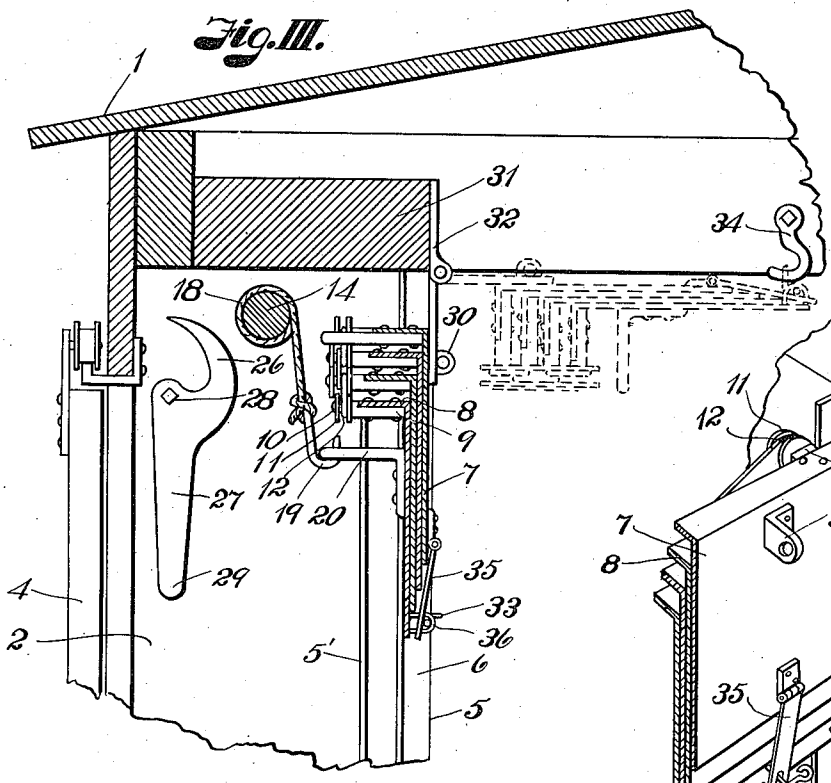


Fig. IV.

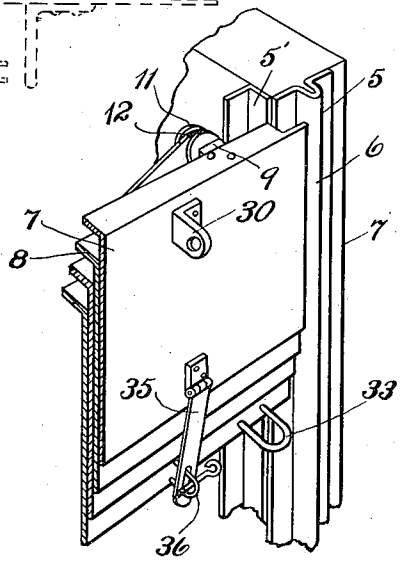


Fig. V.

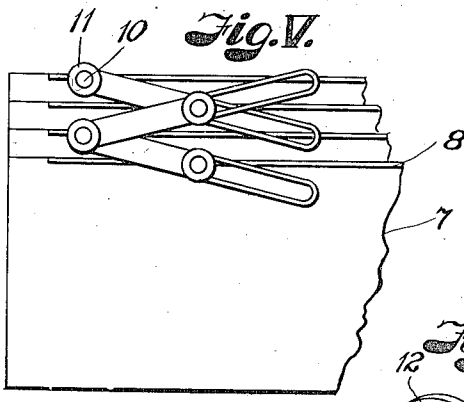


Fig. VI.

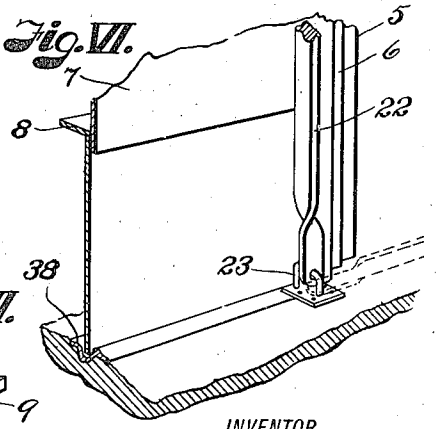


Fig. VII.

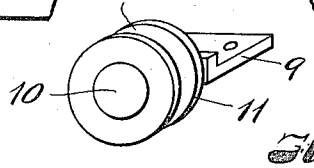


Fig. VIII.

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UNITED STATES PATENT OFFICE.

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GRAIN-CAR DOOR.

1,140,100. Specification of Letters Patent. Patented May 18, 1915.

Application filed November 14, 1912. Serial No. 731,400.

To all whom it may concern:

Be it known that we, CHARLES W. BASH and AMBROSE BASH, citizens of the United States, residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Grain-Car Doors; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to car doors, and more particularly to an inner door for grain cars; the principal object of the invention being to provide a device of this character which may be easily and quickly raised to permit the delivery of grain from a car after the outer or sealing door has been opened.

It is also an object of the invention to provide a grain door which is strong and durable in construction, so that it may be used repeatedly, and also to provide such a door which may be mounted permanently in the car.

It is a further object of the invention to provide a door of this type which will fold or telescope upwardly and which may be carried in its folded position at the top of the outer opening when the car is empty, so that it may not interfere with the use of the car in hauling goods other than grain, and so that it will be in a position where there is small likelihood of its being damaged.

In accomplishing these and other objects of the invention, we have provided the improved details of structure hereinafter described and illustrated in the accompanying drawings, wherein:—

Figure I is an elevation of a grain car door, constructed according to our invention. Fig. II is a vertical section on the line II—II, Fig. I. Fig. III is an enlarged cross section of a part of the car showing the door in its upper or folded position, the dotted lines illustrating it suspended from the top of the car. Fig. IV is a perspective view of a part of the door as it appears when in open position. Fig. V is a front view of the door members, particularly illustrating the slide links. Fig. VI is a detail view of the lower end of one of the clamp bars, illustrating its mounting. Fig. VII is a detail view of one of the slide links. Fig. VIII is a detail perspective of one of the slide link studs.

Referring more in detail to the parts: 1 designates a grain car of any ordinary construction having a side door opening, provided with the usual jambs 2 and sill 3, and provided with an ordinary hung door 4. Fixed to the inner edges of the door jambs are plates 5 having vertical guide ribs 6 which extend throughout the height of the door opening, and fixed to the inner faces of the door jambs are angle members 5′, which extend to near the top of the door opening, the plates and angle members serving to confine the door members, presently described.

The door body is composed of a number of sections 7, preferably of stiff sheet metal, of such length that they will extend across the door opening and fit flush against the guide ribs 6, the upper edge of each section being turned forwardly to form a stop flange 8. Fixed to each of the door members, preferably to the under face of the flange 8, is a pair of lugs 9, each of which carries a short stud 10. having collars 11 fixed thereon in spaced relation to inclose an annular space 12.

The door sections are adapted for vertical arrangement, so that their body portions will overlie each other when a door is collapsed or folded, and the lower edge of each successively upper portion will overlie the upper edge of the next lower portion to form an overlapped seal, the flanges 8 being always superimposed so that when the bottom door section is raised it will engage the flange of the next higher section and open the door from the bottom as the flanges of succeeding sections are brought in contact with each other during the upward travel of such lower section.

In order to provide for the folding or telescoping action of the door sections, we arrange the link studs on succeeding sections in staggered relation, as illustrated in Fig. I, so that the members of each pair of links will hang in oppositely directed inclines, it being apparent that the inturned links hold against each other and that the out-turned links are held in spaced relation by the engagement of their lower ends with the outwardly spaced studs.

With the links arranged in this manner,

the door sections may be held in proper spaced relation when a door is closed and the links will be in position to readily fold and allow the door sections to telescope when the sections are raised from below.

Journaled in suitable bearings in the door jambs, at the top of the door opening, is a shaft 14, having gear connection 15 with a shaft 16 which extends vertically within the car and has a hand wheel 17 fixed on its lower end.

Fixed on the shaft 14 are ropes 18 having hooks 19 at their free ends adapted to take in brackets 20 on the upper door section, or into brackets 21 on the lower door section, so that the door may be unfolded to close the opening when the rope is connected with the upper section and the shaft is revolved, or the door may be opened by connecting the ropes with the lower brackets and revolving the shaft to wind the ropes thereon and lift the door so that it will fold upwardly.

In order to hold the door rigidly in place when it is unfolded, and adapted for closing the opening, we provide the clamp bars 22 which are pivotally mounted on link brackets 23 on the bottom of the car, and adapted to lay over the inner faces of the unfolded door when the latter is closed.

On the upper end of each of the clamp bars is a laterally turned flange 24, having an opening 25 therein into which the cam hook 26 of a latch bar 27 is adapted to project, the latch bar being pivotally mounted on a pin 28 carried by the jamb and provided with a handle portion 29 which may be easily reached from the outside of the car. The door may have a clamp bar of this kind at each end, and it is apparent that when the door is closed the bar may be raised over its inner face and the latch rocked to project its hook end through the latch aperture and tighten the bar against the door, to hold the latter firmly in place.

It is apparent that the door may be held in its raised position by the ropes 18, but in order that the door may be swung out of the door opening when not in use, we provide the upper door member with eye brackets 30, and the upper cross-sill 31 with hangers 32 which are adapted to take into the eye brackets and pivotally support the door. We also provide the lower door member with a staple 33, which may be engaged by a hook 34 on the roof of the car, so that when the folded door is swung inwardly and upwardly it may be connected with the hook 34 and suspended out of the way when the car is to be used for goods other than grain, or the like.

In order to hold the door sections firmly together, when in folded relation, we prefer to provide the upper member with a hasp 35 and the lower member with a staple 36 with which the hasp may be connected to hold the sections together (Fig. IV).

We also prefer to place a grooved rail 38 in the door sill, within which the lower edge of the bottom door section may seat to form a seal that will effectually prevent the loss of grain beneath the door.

We also prefer to provide the shaft 14 with a center bracket 39 which may be hung from the central portion of the door frame and stiffen the shaft.

Presuming the parts to be constructed and assembled as described, when the door is not in use, the ropes 18 are connected with the hook brackets on the bottom door section and wound on the shaft to lift the door to the top of the car. When the door is in its upper position, the upper and lower sections are connected by the hook, the hangers are connected with the eye brackets and the door swung inwardly and connected with the hook 34 so that it may be supported in folded position and out of the way of any one wishing to enter the car, or of the contents of the car, when the latter is used for material other than grain, or the like.

When the door is to be used, it is released from the hook so that it may swing back to vertical position, the hook disconnected from the lower door section and the hanger 32 disconnected from the upper sections. The shaft is then reversed to allow the ropes to unwind and lower the door sections, the latter descending in their folded relation to the bottom of the door opening. After the door has been lowered, as described, the rope hooks are removed from the brackets on the lower door section and connected with those on the upper door section and the shaft turned forwardly to again wind the ropes thereon. As the rope is wound on the shaft it raises the upper door section, and when the latter has straightened its links to its full extent, such links pull on the succeeding section so that as the upper section continues to rise the second section is carried therewith, in this way unfolding the door until it has been fully extended and closes the door opening. The door is then held from above and the clamp bar raised against its inner surface and latched, as heretofore described.

When a car is filled with grain, the weight of the latter pressing against the door sections will serve to hold the loose edges of upper sections against the lower bars, so that the seal of the door is made more perfect as the pressure due to the weight of the grain is increased thereagainst.

When the car is to be unloaded the ropes are again connected with the lower door section and wound on the shaft to elevate such section. As the lower section is lifted to expose the interior of the car, the grain flows therebeneath and relieves the pressure

on that section, so that it may be more easily raised, it being apparent that the grain will flow from the part immediately back of the door to relieve the door so that it will be completely opened in order that the workmen may gain access to the car in order to unload its contents.

Having thus described our invention, what we claim as new therein and desire to secure by Letters-Patent, is:—

1. A grain door comprising a plurality of individual sections each having a laterally turned flange at its upper edge, lugs on said flanges having outstanding studs and keeper collars on said studs, and a pair of links pivotally mounted on one of said studs and each having a slotted portion overlying the stud on an adjacent section and retained in place by the collars on said last named studs, substantially as set forth.

2. In a grain door, the combination with a plurality of individual door sections, having apertured brackets on the upper and lower section thereof, of a shaft, ropes on said shaft, hooks on said ropes adapted for engagement with either of said apertured brackets, and means for turning said shaft, whereby the sections may be nested by lowering from the top or by raising from the bottom, substantially as described.

3. The combination with a door frame having a door opening, of a sectional door comprising a plurality of sections, a winch for engaging either the lower or upper section for nesting the said sections at the top or bottom of the door opening, means for latching the sections in nested position, a hinge at the top of said door opening, and means for removably connecting said hinge to said door, for the purpose set forth.

4. The combination with a door frame having a door opening, of a collapsible door, and means for collapsing said door to expose either the top or bottom portion of said door opening.

5. The combination with a door frame having a door opening, of a door for inclosing said door opening, comprising a plurality of sections, and means for nesting said sections at the top or bottom of the door frame to expose the bottom or top portion of the door opening.

6. The combination with a door frame having a door opening, of a door for inclosing said door opening, comprising a plurality of interconnected sections, means for nesting said sections, and means for locking said sections in nested position.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES W. BASH.
AMBROSE BASH.

Witnesses:
LEWIS L. MILLER,
LETA E. COATS.