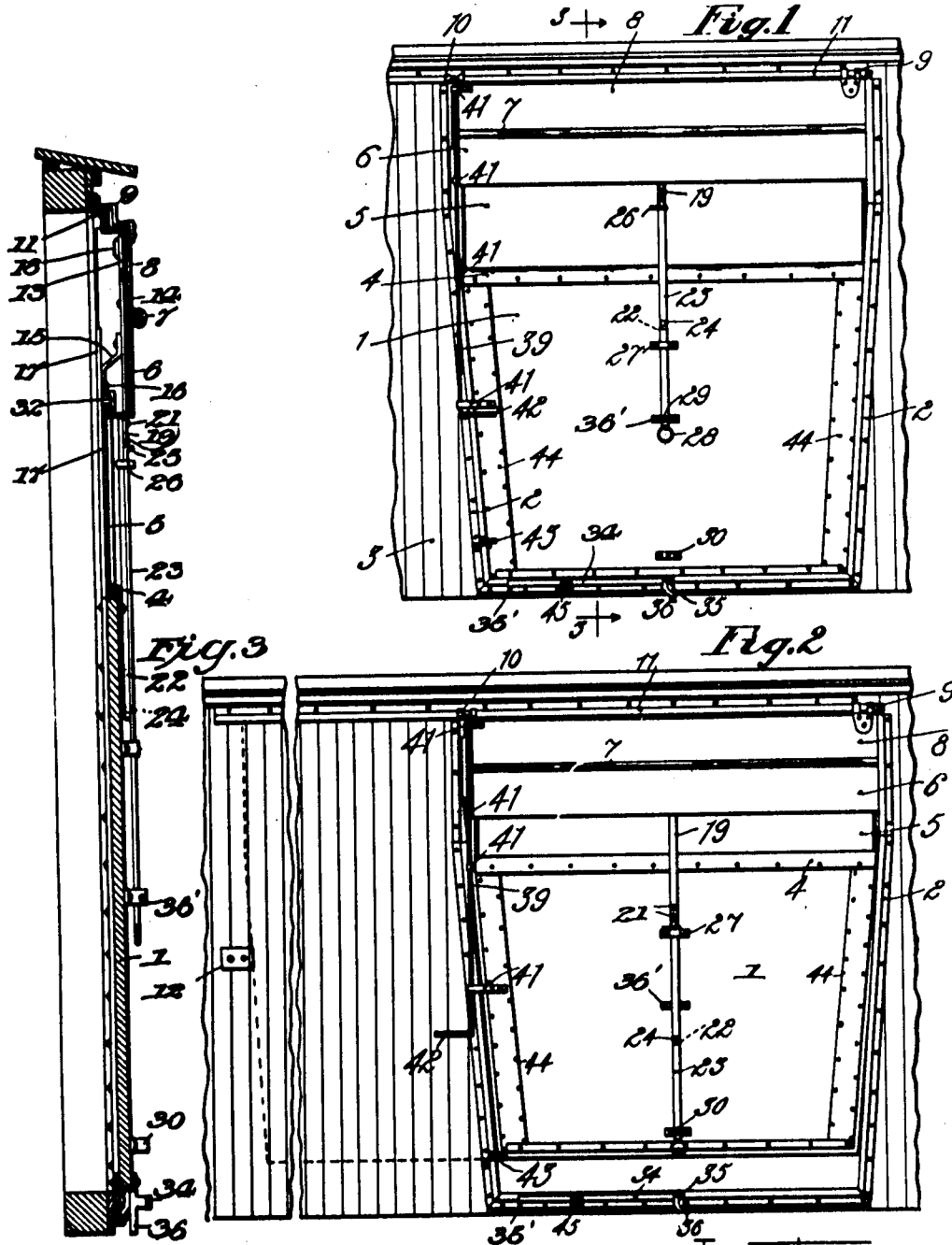


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APPLICATION FILED NOV. 6, 1911.

Patented Apr. 8, 1913.

2 SHEETS-SHEET 1.



Witnesses

Robert B. Brache  
Leonard W. Novander

Inventor

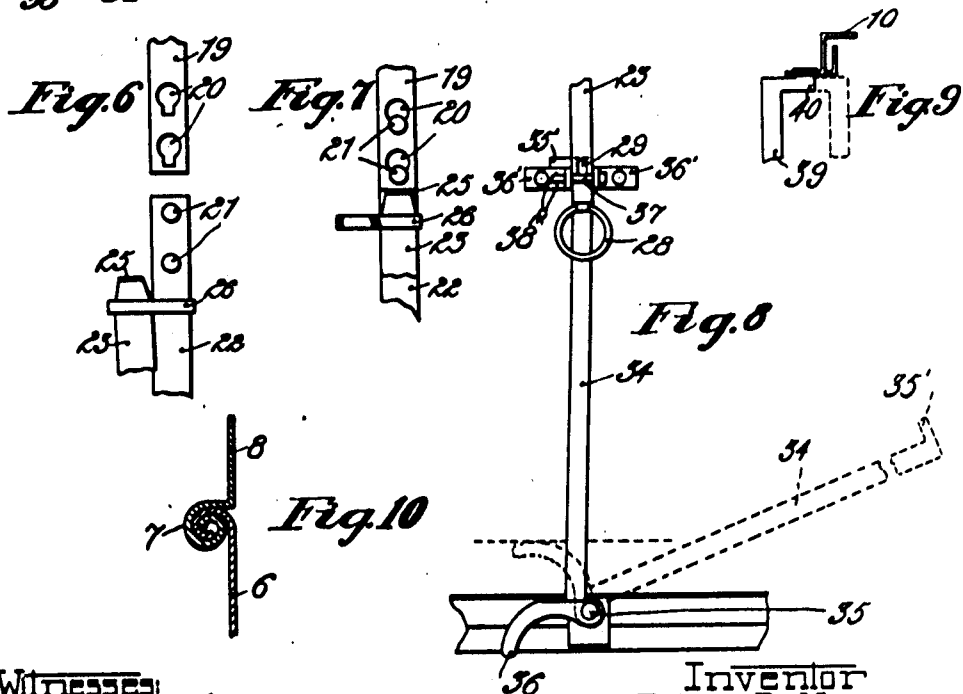
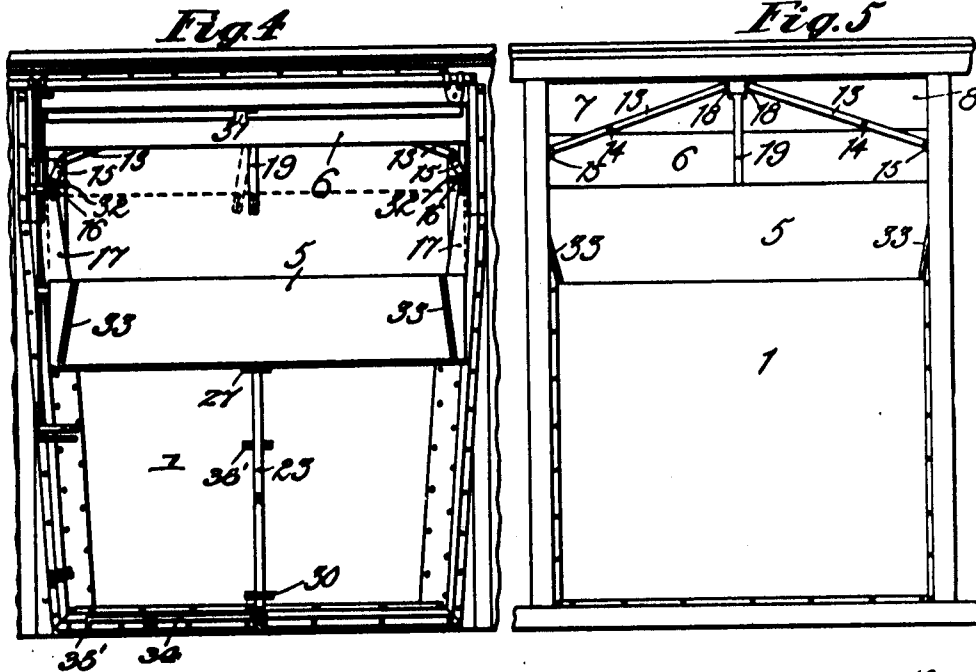
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# UNITED STATES PATENT OFFICE.

JOHN A. KING, OF SOUTH CHICAGO, ILLINOIS.

## CAR-DOOR.

1,058,182.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed November 6, 1911. Serial No. 658,633.

*To all whom it may concern:*

Be it known that L. JOHN A. KING, a citizen of the United States, residing at South Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Doors, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to an improved construction of door for freight cars, and the particular use to which it is applicable is as an outside grain door, by which inside grain doors are entirely done away with and all of the advantages secured heretofore by the use of both inside and outside doors are afforded by my outside door construction without in any way interfering with the filling or emptying of the car but, on the other hand, facilitating all of the operations that are required in connection with loading and unloading grain cars, and at the same time providing a construction which is substantial and simple both to make and operate.

The several drawings illustrating my invention are as follows: Figure 1 shows a side view of a portion of a car and a door constructed according to my invention and in closed position. Fig. 2 is a view similar to Fig. 1 showing the door partially opened at the bottom. Fig. 3 is a sectional view through the door shown in Fig. 1, taken along the line 3—3. Fig. 4 is a view of the door shown in Fig. 1 with its upper swinging panels in open position. Fig. 5 is an inside view of the door shown in Fig. 4, the upper swinging panels being in closed position. Fig. 6 is a detail view of the operating bar of the door showing its two parts detached from each other. Fig. 7 is a detailed view of the parts shown in Fig. 6, the parts in this view being shown in their connected relation. Fig. 8 is an enlarged detail view of the means employed for sealing the door in its shut position. Fig. 9 is a detail view of one of the sliding supports for the door. Fig. 10 is a detailed view of the hinge construction preferably employed in connection with the swinging panels connected with the upper portion of the door.

Similar numerals refer to similar parts throughout the several views.

As shown in Figs. 1, 2, 3 and 4, the door consists of a main panel 1 having slightly in-

clined edges coöperating with the inclined guides 2, 2 secured to the side of the car 3, so that when the door is in engagement with the guides 2, 2, as shown in Fig. 1, it is wedged tightly into proper position so that it cannot be accidentally displaced, but, on the other hand, the guides 2, 2, as they project around the outside edges of the door on its sides and bottom, serve to make a tight closure all around the edges of the door. The panel 1 has hinged to its upper edge at 4 a swinging panel 5 which normally is in vertical position inside of a second swinging panel 6 hinged near the upper edge of the door at 7. The hinge 7 is secured to the upper panel 8 of the door, which has secured to its upper edge the sliding guides 9 and 10 which engage a track 11 extending longitudinally of the car above the door opening, as a result of which, when the door is disengaged from its guides, it may be moved to the position indicated in dotted lines in Fig. 2 against the stop 12. The lower panels 1 and 5 of the car door are secured to the upper panel 8 by means of the mechanism indicated in Figs. 4 and 5, consisting of two levers 13, 13 pivoted to the upper panel 8 at 14, 14, which levers have pivotally secured to their outer ends the links 15, 15, the other ends of which are pivotally secured at 16, 16 to the upper ends of the side members 17 constituting a part of the framework of the panels 1 and 5. The inner ends of the levers 13 are secured by means of links 18, 18 to the upper end of the bar 19, so that when the bar 19 is pulled downward the links 15 are moved upward and thus raise the frame members 17 and, therefore, the panels 1 and 5. As the panel 5 is normally in vertical position behind the panel 6, motion of the bar 19 serves to telescope the portions of the door one into the other and, by this operation, the lower portions of the door are moved to the position indicated in Fig. 2.

To facilitate the operation of the bar 19 and at the same time make it detachable from its operating means so that the panels 5 and 6 may be opened, the lower end of the bar 19 is provided with two openings 20, as shown in Figs. 6 and 7, adapted to receive the heads of pins 21 secured in the upper end of a bar 22. The openings 20 have slots extending from their lower portions to engage the body portions of the pins 21, so that after the heads of the pins have been in-

serted through the openings 20 the slight longitudinal motion of the bar 22 relatively to the bar 19 will move the body portion of the pins 21 into the slots and, as long as they are held in this position, the pins cannot be removed from the slots. To prevent displacement of the pins from the slots a locking bar 23 is pivoted to the bar 22 at 24, its upper end being bent at 25 so as to engage the lower end of the bar 19 when the bar 23 is swung about the pivot 24 so as to lie above the bar 22 with which it has sliding engagement. A guide 26 is secured to the bar 22 to limit the motion of the locking bar 23 so that it may at all times be in position to cooperate with the bar 19. The bar 23 extends through a guide 27 secured to the panel 1 and is continued downward a sufficient distance so that the ring 28, secured to the lower end of the bar, may be accessible to those whose duty it is to open the doors of the cars. When the bars 22 and 19 are moved downward so as to raise the panel, a slot 29 in the bar 23 engages a projecting lug 30, secured to the panel 1, to hold the panel in its raised position, as indicated in Fig. 2.

The lower edge of the panel 6, which is turned at substantially a right angle to its body portion to reinforce the lower edge of the panel, is provided with an L-shaped opening 31 as shown in Fig. 4 of such a conformation that, with the panel in its closed position and the bar 19 in engagement with the opening 31 when said bar is in position to close the door as indicated in Fig. 1, said bar serves as a lock to secure the panel 6 in its closed position. When it is desired to open the panel 6, this is done by first moving the locking bar 23 from engagement with the lower end of the bar 19, then disengaging the bar 22 from the bar 19, after which the bar 19 is swung slightly to the left, as shown in dotted lines in Fig. 4, to the left-hand portion of the opening 31, from which position the panel 6 may be swung upon its hinge 7 outward and present an opening large enough to admit a man to the car for the purpose of trimming the grain after it has been loaded into the car. When the bars 19 and 22 have been disengaged from each other, the bar 23 drops through the guide 27 until the portion 26 prevents its further movement, for which condition the panel 5 may be opened by first turning the buttons 32, shown in Fig. 4, to their upper position to disengage the panel and in this way an opening is provided, which is sufficient for inserting the loading spouts and for affording free access to the car. The buttons 32 are preferably secured to the framework 17 by the same pivotal bolts 16 which support the links 15. The panel 5 is provided with strips 33 adapted to fit closely to the inner edges of

the frame pieces 17 so that a tight joint will result when the panel 5 is closed.

It frequently happens that the weight of the grain inside of a car is sufficient to make it difficult to move the car door to a position to relieve the pressure behind it. To accomplish this, I provide a lever 34 pivoted to the bottom of the door opening at 35, which lever is provided with a cam 36 adapted to engage the lower edge of the door, as indicated in dotted lines in Fig. 8, so that motion of the lever around to the right upon its pivot, serves to raise the door sufficiently to relieve the pressure behind it, after which the door may be raised by means of the bars 23 and 19 to a position such that the edges of the door will clear the guides 2. The lever 34 serves, when the door is closed, to engage by means of a hook 35' formed at its end, one of the retaining clips 36' secured to the car door and when thus in place the lower end of the bar 23 is also placed between these clips and a bolt 37 is inserted through the clips over the bar 23 and held in place by a suitable seal 38, as indicated, for which condition the car door is securely closed, since the bar 23 cannot be moved vertically to permit disengagement of the bar 19 therefrom.

The sliding guide 10 is secured to the upper left-hand corner of the panel 8 by means of a rod 39 having a crank 40 formed on its upper end, which engages said guide. The rod 39 is supported from the left-hand edge of the several portions of the door by means of brackets 41, so that the rod may be rotated and, further, so that the panels 1 and 5 may be moved vertically relatively to the panels 6 and 8. The lower end of the rod 39 is bent so as to form a handle 42, by means of which the rod may be rotated. The normal position of the rod is that shown in dotted lines in Fig. 9, which serves to hold the upper portion of the door close to the car side at its left-hand edge, as shown in the drawings. After the door has been raised to the position indicated in Fig. 2, as described above, the rod 39 is rotated by means of the handle 42 until it occupies the position shown in full lines in Fig. 9, which serves to move the upper left-hand corner of the door away from the side of the car sufficiently so the door will clear the left-hand guide 2, for which position the entire door may be slid upon the track 11 to clear the door opening, and, in this way, the door may be operated as the ordinary sliding door now employed in connection with freight car construction. A guide 43 is secured to the edge of the door opening to engage the lower edge of the door when in its raised position to prevent its swinging away from the side of the car and to thus serve as a lower guide for the door while being slid from one position to another.

The panel 1 of the door is preferably constructed of wood and provided with metal plates 44 lining its edges to protect them and prevent nailing through the edges to improperly hold the door in closed position. The panels 5, 6 and 8 are preferably made of sheet metal and the hinges 4 and 7 are preferably made, as indicated for the hinge 7 in Fig. 10, by rolling the edges of the panels 6 and 8 so that they interlock to form a swinging joint which may, if required, be so constructed as to be separable when in one position by moving one member longitudinally relatively to the other. The advantage of using the construction of hinges shown is that the door is made water-tight and the contents of the car are thoroughly protected. It is obvious that other constructions may be employed if desired.

When it is desired to close the door, after sliding it to the position shown in Fig. 2 by removing the bar 22 from the lug 30, the weight of the door is sufficient to move it positively into proper engagement with the guides around the edges and bottom of the door. A supporting bracket 45 is provided for holding the lever 34 when the car door is in its open position.

While I have shown my invention in the particular embodiment herein disclosed, I do not, however, limit myself to this construction, but may employ other mechanical equivalents that may suggest themselves to those skilled in the art.

What I claim is:

1. In combination, a car body, a door having two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, and a swinging panel in the upper portion of the door for permitting access to the car, such panel being held in closed position by the operating bar, such operating bar being separable to permit its disengagement from the panel so that the latter may be opened.

2. In combination, a car body, a door having two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, and two swinging panels in the upper portion of the door for permitting access to the car, such panels being held in closed position by the operating bar, said operating bar being separable to permit its disengagement from the panels.

3. In combination, a car body, a door having two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers

with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, and two swinging panels meeting along their free edges in the upper portion of the door for permitting access to the car, such panels being held in closed position by the operating bar, such operating bar being separable to permit its disengagement from the panels so that the latter may be opened.

4. In combination, a car body, a door having two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, and two swinging panels meeting along their free edges in the upper portion of the door, the upper one extending along the whole width of the door and being hinged along its upper edge, and the lower one extending along the whole width of the door and being hinged along its lower edge to provide an uninterrupted opening when in the open position.

5. In combination, a car body, a door having two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, and two swinging panels meeting along their free edges in the upper portion of the door, the upper one extending the whole width of the door and being hinged along its upper edge and the lower edge extending along the whole width of the door and being hinged along its lower edge to provide an uninterrupted opening when in their open position, such panels being adapted to be held in their closed position by the operating bar, such operating bar being movable to disengage the panels to permit them to open.

6. In combination, a car body, a door having two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, two swinging panels meeting along their free edges in the upper portion of the door, the upper one extending along the entire width of the door and being hinged along its upper edge, and the lower one extending along the entire width of the door and being hinged along its lower edge to provide an uninterrupted opening when in their open position, and buttons for holding the lower panel in place, such buttons being supported by the bolts constituting the fixed pivots of the links.

7. In combination, a car body, a door hav-

ing two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, a swinging panel in the upper portion of the door for permitting access to the car, such panel being held in a closed position by the operating bar engaging in said opening, such operating bar being separable to permit its disengagement from the panel so that the latter may be opened.

8. In combination, a car body, a door having two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, a swinging panel in the upper portion of the door for permitting access to the car, such panel being held in a closed position by the operating bar, such operating bar being separable to permit its disengagement from the panel so that the latter may be opened, a cam lever pivoted to the car body for raising the lower portion of the door from its closed position, retaining clips on said lower portion, said cam lever being adapted to engage between said clips, said operating bar also being adapted to engage between said clips, a bolt engaging each of said clips above the cam lever and operating bar, and sealing means for engaging one end of said bolt.

9. In combination, a car body, a door having two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers

with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, a swinging panel in the upper portion of the door for permitting access to the car, such panel being held in a closed position by the operating bar, such operating bar being separable to permit its disengagement from the panel so that the latter may be opened, a cam lever pivoted to the car body for raising the lower portion of the door from its closed position, retaining members on the lower portion of the door, said cam lever and operating bar engaging said retaining members, means for maintaining the cam lever and operating bar in such engagement, and sealing mechanism engaging said means.

10. In a device of the class described, the combination of a car body, a door having two portions movable vertically relatively to each other, levers pivoted to one of the portions, links connecting the levers with the other portion, a bar connected with the levers for moving the levers to raise the lower portion of the door, a swinging panel in the upper portion of the door for permitting access to the car, such panel being held in closed position by the operating bar, a swinging panel in the lower portion of the door normally engaging the other swinging panel, such operating bar being separable to permit its disengagement from the panels so that they may be opened.

In witness whereof, I hereunto subscribe my name this 2nd day of November, A. D., 1911.

JOHN A. KING.

Witnesses:

ALBERT C. BELL,  
LEONARD E. BOGUE.