

J. H. CHENOWETH.
FREIGHT CAR DOOR.
APPLICATION FILED SEPT. 20, 1904.

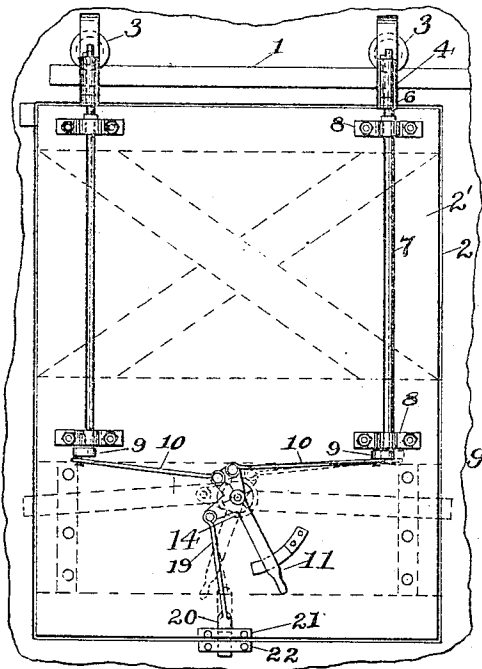


Fig. 1.

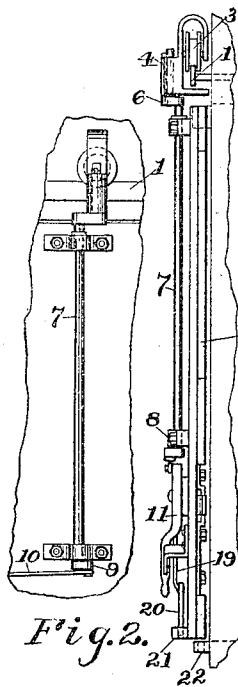


Fig. 2.

Fig. 3.

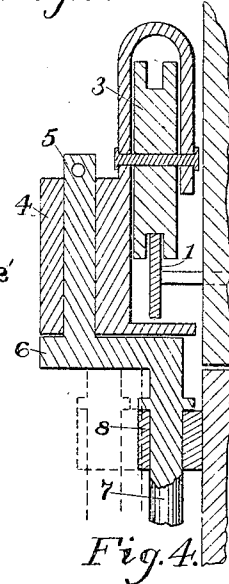


Fig. 4.

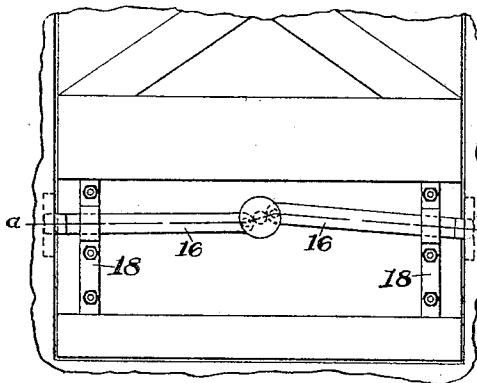


Fig. 5.

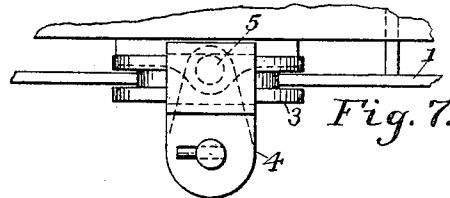


Fig. 7.

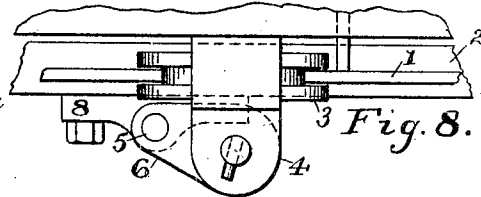


Fig. 8.

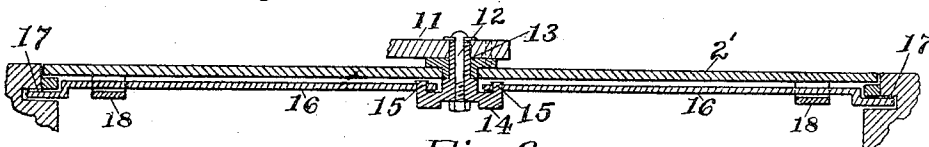


Fig. 6.

Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN H. CHENOWETH, OF CHICAGO, ILLINOIS.

FREIGHT-CAR DOOR.

No. 801,439.

Specification of Letters Patent.

Patented Oct. 10, 1905.

Application filed September 20, 1904. Serial No. 225,163.

To all whom it may concern:

Be it known that I, JOHN H. CHENOWETH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Freight-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 freight-cars, and has for its object the provision of improved side doors therefor, whereby the doors may be caused to be flush with the sides of the cars when the said doors are in closed positions and may be moved outwardly from the sides of the cars when the doors are to be moved away from the door-openings. In the preferred embodiment of my invention there are employed in connection with each door two pulleys or sheaves, which are adapted to roll upon a track provided above the upper horizontal margin of the door-opening, which pulleys are provided with housings, which in turn carry or afford bearings for short arms of cranks, longer arms of the cranks being journaled in bearings provided upon the door, each crank proper being interposed between the short arm and the long arm, whereby the rotation of the crank about the longer arm effects the bodily movement of the door toward the car side or away from the car side, as desired. The longer arms of the cranks are disposed along the vertical margins of the doors and are provided with a common actuating agency, preferably in the form of a hand-lever that has two link connections with the longer arms, the link connections being joined with the longer crank-arms, preferably by cranks provided upon the lower ends of the said arms, whereby the simultaneous movement of the said links causes the simultaneous rotation of the said longer arms, and consequently a simultaneous actuation of the cranks mounted upon or carried by the pulley-housings, whereby the door is moved at both of its vertical edges toward and away from the side of the car, such movement in a transverse direction being uniform, as a result of the simultaneous operation of the longer arms of the cranks. The longer arms of the cranks thus constitute crank-shafts, upon the upper and lower ends of which are provided the cranks. The rotation of these longer arms or crank-

shafts in their bearings causes the simultaneous rotation of the shorter crank-arms in the bearings provided in the pulley-housings. In practice I found it sufficient to provide a positive door-shifting agency at the upper horizontal margin of the door, as gravity will clear the lower end of the door from the car. In order that the mechanism may be simplified to the greatest extent, the locking device is also operated by the same agency or lever that effects the simultaneous rotation of the crank-shafts, the said locking element being so relatively disposed with respect to the actuating-lever or lever mechanism that when the cranks at the upper ends of the shafts are shifted to move the door away from the car the locking device will be out of operative relation with the car side and car-door, whereas when the said cranks are shifted to cause the door to lie in the door-opening the said locking agency is brought into operative relation with the car side and car-door. In order that the locking mechanism may be protected, I provide the same within the car, and preferably provide locking action between the vertical margins of the door and the corresponding margins of the doorway. The locking instrumentality is preferably in the form of two sliding bolts carried upon the door and moving in a substantially horizontal direction, two pocketed elements upon the vertical margins of the door-opening into which the said locking-bars may be inserted and from which they may be withdrawn, a common actuating member, preferably a plate, to which the said locking-bars are pivoted at their inner or adjacent ends, the said plate having a pivotal mounting that is interposed between the adjacent ends of the locking-bars and a fixed mechanical connection between the said plate and the lever that effects the rotation of the crank-shafts, whereby a simultaneous movement of the crank-shafts and the locking-bars is effected. These locking-bars as I have designed them are adapted to secure, as stated hitherto, a locking relation between the door at its side margins and the corresponding margins of the door-opening. These locking-bars are desirably located near the lower portions of the door, as the crank mechanism near the upper portion of the door is sufficient to hold the latter portion in place. In order that the central lower portion of the door may not be outwardly bulged, I provide

a locking element that is also preferably actuated by the crank-shaft-operating lever to secure the bottom margin of the door to the car at the corresponding margin of the door-opening.

I will explain my invention more fully by reference to the accompanying drawings, in which—

Figure 1 is a side elevation showing the door of my invention in a closed position. Fig. 2 is a detail showing one of the crank-shafts rotated to remove the door from the car side. Fig. 3 is an end view illustrating the door mechanism. Fig. 4 is a view in sectional elevation at right angles to the plane of the door, showing the pulley-housing and crank mechanism carried thereby. Fig. 5 is a rear view showing my improved locking mechanism. Fig. 6 is a plan view, on an enlarged scale, on line *aa* of Fig. 5. Fig. 7 is a plan view of one of the crank devices as it appears when the door is closed. Fig. 8 is a view showing the mechanism of Fig. 7 in the alternative position it occupies when the door is removed from the side of the car.

Like parts are indicated by similar characters of reference throughout the different figures.

The freight-car is provided with a running-track 1, located lengthwise of the car above the upper horizontal margin of the door-opening 2 and extending a distance along the car to afford a longitudinal travel for the door 2' required. Where it is desirable to reduce the friction that the door encounters as it is moved along the track, the door-carriers or suspending mechanism that hold the door upon the track include pulleys 3 3, whose grooves are engaged by the track and which are journaled in housings 4, in the lower ends of which there are provided journals for the crank-stems 5 at the outer ends of the cranks 6, the remaining ends of said cranks 6 being attached to the crank-shafts 7, the elements 5, 6, and 7 being rigid with respect to each other. The crank-shafts 7 are provided with journals 8 at the top and near the bottom of the door, the said shafts serving when being turned bodily to rotate about the axis afforded by the stems 5, whereby the car-door is moved inward and outward, and as the car-door is released from the bottom portion of the doorway when the upper portion of the door is moved outwardly the said door hangs clear of the car side, so that it may be readily moved along the track. The crank-shafts 7 are preferably caused simultaneously to rotate, to which end the lower ends of the said shafts are equipped with cranks 9, that are fixed with respect to said shafts, these cranks 9 being connected by means of links 10 with a rotatably-mounted lever 11. Said lever as it is moved obviously serves simultaneously to actuate the links 10, which, as they are connected with the outer ends of the cranks 9,

effect the simultaneous operation of the shaft 7 that is desired. The hand-lever 11 upon the exterior of the car is rigidly secured to a shaft 12, Fig. 6, which is journaled within a mounting 13, carried upon the car-door 2'. There is rigidly secured to this lever a crank plate or element 14, having crank-pins 15 15 on opposite sides of the axis of rotation afforded by the journal 13 for the lever 11. The inner ends of the locking-bars 16 are journaled upon the crank-pins and are provided, preferably, with offsets at their other ends to engage locking-grooves 17, provided in the vertical margins of the doorway. Guiding-straps 18 are mounted upon the back or inside of the door, that serve to guide the locking or outer ends of the locking-bars into and out of the locking-pockets. It will be seen that by this mechanism the door-lock is concealed upon the interior of the car and that a common actuating-lever is employed for the purpose of effecting the simultaneous operation of the locking mechanism and the door-shifting mechanism, the said lever also desirably simultaneously operating a supplemental locking device for locking the middle portion of the lower horizontal margin of the door and the corresponding margin of the door-opening. This mechanism, as illustrated, comprises a link 19, to the lower end of which is secured a locking-bolt 20, that passes through a strap 21 upon the lower edge of the door and into a strap or socket 22, correspondingly located upon the lower horizontal margin of the door-opening.

By reference particularly to Figs. 4, 7, and 8 it will be understood in what manner the door is moved from and brought toward the car side by the operation of the cranks 6, these figures clearly indicating how the cranks in one position will effect the closure of the door within the door-opening and in another position will effect the removal of the door from the side of the car to enable the said door to travel upon the track 1.

By means of the locking mechanism illustrated but one car-seal need be employed when the door is in a closed position, as will be readily apparent by an inspection of the drawings. I have not indicated such car-seal, as such an instrumentality and its use is well understood to those skilled in the art.

It will be observed that the bottom of the door is entirely unrestrained when it is not locked, so that it may readily be manipulated by a handler to afford sufficient clearance between the door and the car side to permit the bodily movement of the door upon the track toward and from the door-opening. I do not wish to be limited, however, to an absolutely unrestrained movement of the lower portion of the car-door toward and from the car side.

While I have shown pulleys for suspending the door, I do not wish to be limited to this precise arrangement, for it is well known to

those skilled in the art that pulleys are not an absolute essential to the suspension of car-doors.

5 It is obvious that changes may readily be made in the precise embodiment of the invention herein shown and particularly described, and I do not, therefore, wish to be limited to the precise construction illustrated; but,

10 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

15 In freight-car construction, the combination with the freight-car side, of a freight-car door, crank-shafts displaced from each other and journaled upon the door, cranks carried at the upper ends of the said crank-shafts, and provided with stems, a track upon which the door may travel, pulleys for moving upon the said track, and provided with housings, the said

housings carrying bearings for the aforesaid stems, a locking device upon the rear of the door and operable from the front thereof, and lever mechanism simultaneously effecting the rotation of said crank-shafts and the operation of said locking device, said lever mechanism including a rotating hand-lever 11, links 10 25 connected with the hand-lever and cranks 9 upon the lower ends of said crank-shafts connected with the outer ends of said links, substantially as described.

In witness whereof I hereunto subscribe my name this 15th day of September, A. D. 1904. 30

JOHN H. CHENOWETH.

Witnesses:

G. L. CRAGG,
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