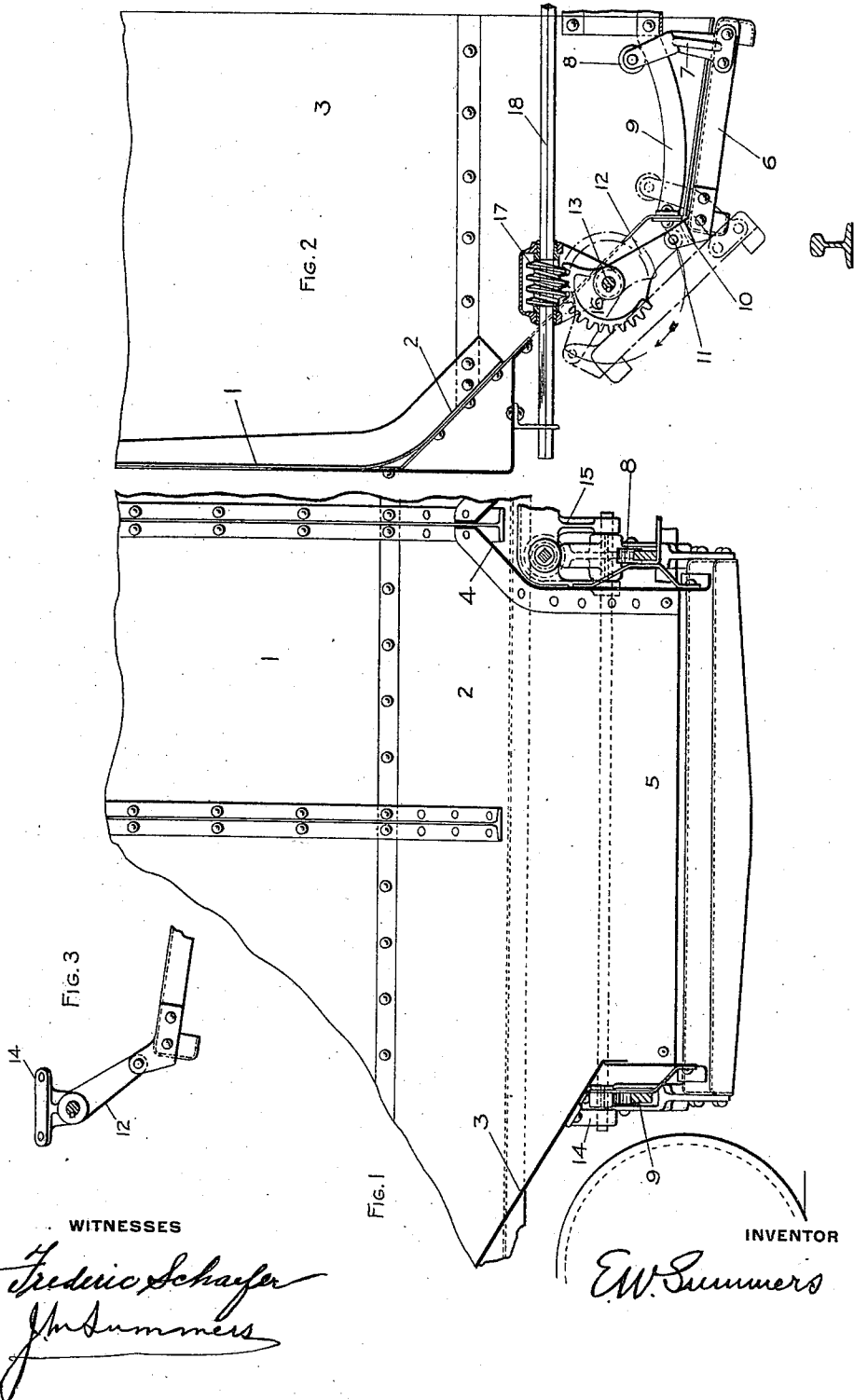


E. W. SUMMERS.
DUMPING DOOR FOR RAILWAY CARS.
APPLICATION FILED NOV. 13, 1909.

975,804.

Patented Nov. 15, 1910.



UNITED STATES PATENT OFFICE.

EDGAR W. SUMMERS, OF PITTSBURG, PENNSYLVANIA.

DUMPING-DOOR FOR RAILWAY-CARS.

975,804.

Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed November 13, 1909. Serial No. 527,812.

To all whom it may concern:

Be it known that I, EDGAR W. SUMMERS, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Dumping-Doors for Railway-Cars, of which the following is a specification.

This invention relates to hopper bottom railway cars and more particularly to the door arrangement and operating mechanism therefor.

The object of the invention is to provide doors and door operating mechanism for hopper bottom cars which enables the center of gravity of the loaded car to be carried quite low and nevertheless permit the opening of the doors without contacting with the track, and which overcomes the frictional resistance due to the load resting on the door when opening the latter.

The invention comprises the arrangement and combination of parts hereinafter described and claimed.

In the accompanying drawings Figure 1 is a longitudinal section through a portion of a hopper bottom car showing my invention applied thereto; Fig. 2 is a transverse section taken at the transverse center of the car and showing only one-half of the car; and Fig. 3 is a detail view of the operating means at one end of the door.

The car may be of any suitable type provided with a bottom discharge opening or openings. The car chosen for illustration is of metal construction, and is provided with a central transverse hood, or ridge so as to form two discharge openings, each of which is closed by a pair of longitudinally arranged doors. This particular type of car, however, has been chosen for purposes of illustration merely, since the invention can be applied to transversely arranged doors as well as to longitudinally arranged doors, or to a car having one or any other desired number of discharge openings.

In the drawings, one of the side walls of the car is indicated at 1, the lower portion thereof sloping inwardly as at 2, and a sloping end wall or floor plate is shown at 3. The central transverse hood is indicated at 4. These several parts may be constructed, united and braced or stiffened in any suitable way. As shown, there is a bottom discharge opening 5 extending for the greater

part of the width of the car body and from the end sloping floor plates 3 to the central transverse hood 4.

The opening 5 is closed by means of a pair of doors 6. Fig. 2 shows only one of the doors but it will be understood that the arrangement on the opposite side of the car is identical with that illustrated. These doors as shown close inwardly at or toward the longitudinal central line of the car, and when in closed position, illustrated in full lines in Fig. 2, are only slightly inclined from the horizontal. The door shown is of metal construction but, obviously, it may be of any desired construction.

As shown, the door has secured to each of its ends a hanger 7 provided with a roller 8 running on a track 9, one of said tracks being located underneath the sloping end floor plates 3 and the other underneath the central transverse hood 4. The hangers are shown connected to the ends of the door near the inner edge of the latter but this is not absolutely necessary, as they may be connected to the door in any position to effectively support the latter. The tracks 9 extend transversely of the car and curve slightly downwardly toward the sides of the car, so that when the door moves outwardly to open position the rollers run down the curved inclines, thereby dropping the door and freeing the same from the frictional resistance of the latter.

The outer edge of the door is supported, when the door is in closed position, by the door opening and closing mechanism which is as follows: Secured to the outer corners of the door are brackets 10 to which are pivotally connected, as at 11, crank arms 12 secured on a longitudinally arranged shaft 13 located underneath the sloping side plates 2. The shaft 13 at its outer end is mounted in a suitable bracket 14 secured underneath the sloping end floor plate 3, and underneath the hood said shaft is mounted in a suitable bearing member 15. At the outer end of the shaft there is a simple crank arm 12, while beneath the hood the crank arm 12 is integral with a worm wheel segment 16 which is engaged by a worm 17 on a transverse operating shaft 18 which extends out to the side of the car and is squared or otherwise suitably shaped for the attachment of a wrench,

crank or other rotating means. The shaft 13 may extend longitudinally of the car so as to operate all the doors on that side of the car, or several such shafts may be used and a similar shaft or shafts is located on the opposite side of the car to operate the doors on that side. The transverse shaft 18 preferably extends entirely across the car so that it may be operated from either side and so as to operate the longitudinal shafts 13 on both sides of the car and secure a simultaneous dumping of all of the doors, or separate operating shafts for the two sides of the car may be used.

It will be observed that the cranks 12, when the door is closed, are inclined inwardly toward the center line of the car and, consequently, during the first part of the opening movement of the car the cranks move to a true vertical position thereby slightly lowering the outer edge of the door. The consequence is that the door as a whole in the first part of the opening movement drops perceptibly, so as to completely free the same from the frictional resistance of the lading. After the cranks 12 pass a true vertical position they begin to lift the outer edge of the door while the inner edge thereof is still being lowered, the door as a whole pivoting or rotating around a longitudinal axis represented by the axes of the rollers 8. The arrangement is such as to quickly and abruptly tip the door to permit the ready discharge of the lading. In the opening movement of the door no part of the latter drops to any considerable extent and consequently, the doors can be carried very close to the track.

What I claim is:

1. A railway dump car comprising a body provided with a bottom discharge opening, a bodily movable door therefor, supports upon which said door moves and arranged to lower one edge of the door as it moves to open position, and a crank connected to the other edge of the door and serving to support said edge when the door is closed and to lift said edge as the door moves to open position.

2. A railway dump car comprising a body provided with a bottom discharge opening, a bodily movable longitudinal door therefor closing toward the center line of the car, supports upon which said door moves, and a crank connected to the outer edge of the door and serving to support said edge when the door is closed and also as a means for opening and closing the door.

3. A railway dump car comprising a body provided with a bottom discharge opening, a bodily movable longitudinal door therefor closing toward the center line of the car, a hanger connected to each end of the door, supports upon which said hangers move, and a crank connected to the outer edge of the

door and serving to support said edge when the door is closed and also as a means for opening and closing the door.

4. A railway dump car comprising a body provided with a bottom discharge opening, a bodily movable longitudinal door therefor closing toward the center line of the car, a roller on each end of the door, tracks on which said rollers move, and a crank connected to the outer edge of the door and serving to support said edge when the door is closed and also as a means for opening and closing the door.

5. A railway dump car comprising a body provided with a bottom discharge opening, a bodily movable door therefor, supports upon which said door moves, a crank connected directly to the edge of the door at each end thereof, a shaft provided with said cranks, and means for rotating said shaft.

6. A railway dump car comprising a body provided with a bottom discharge opening, a bodily movable door therefor, supports upon which said door moves, a crank connected to each end of the door, a shaft provided with said cranks, an operating shaft, and a worm and worm wheel connecting said operating and crank shafts.

7. A railway dump car comprising a body provided with a bottom discharge opening, a bodily movable door therefor, supports upon which said door moves, a crank connected to an edge of the door and serving to support said edge when closed, and a rotary shaft carrying said crank, said shaft being supported at the side of the door opening and above the door, whereby when said door is opened it is tilted.

8. A door for dump cars mounted to roll bodily toward open position without raising its center of gravity at the initial movement, the supporting mechanism for said door including a crank connected directly to one edge of the door and arranged to lift said edge as the door rolls to open position, and mechanism for rolling said door.

9. An inclined bodily movable door for dump cars mounted to increase its inclination when moved to open position, the supporting means for said door including a crank connected directly to that edge of the door which rises as the door moves to open position, and door moving mechanism.

10. A bodily movable door for dump cars, supporting means therefor arranged to increase the inclination of the door while opening and without lifting any part thereof while underneath the discharge opening, said supporting means including a crank connected directly to that edge of the door which rises as it moves to open position, and door moving mechanism.

11. A bodily movable door for dump cars, supports for said door arranged to lower the door as the latter moves toward open position.

tion, and a crank connected to the outer edge of the door and arranged to move the door and lift said outer edge when opening.

12. A railway dump car comprising a body provided with a bottom discharge opening, bodily movable inclined doors therefor arranged to meet edge to edge when closed, supports upon which said doors move so arranged as to lower one edge of each door as it moves to open position, and means connected to the opposite edge of each door and to the car body and suspending said edge and arranged to lift the same as the door moves to open position.

13. A railway dump car comprising a body provided with a bottom discharge opening, bodily movable inclined longitudinal doors therefor closing toward the center line of the car and meeting at their inner edges, supports upon which said doors move and arranged to lower the inner edges of the doors as they move to open position, and means connected to the car body and to the outer edge of each door and suspending said outer edge and arranged to lift the same as the door moves to open position.

14. A railway dump car comprising a body provided with a bottom discharge opening, a bodily movable longitudinal door therefor closing toward the center line of the car, supports upon which said door moves and arranged as the door moves to open position to lower its inner edge, and a crank connected to the outer edge of the door and serving to support said edge when the door is closed and to lift said edge as the door moves to open position.

15. A railway dump car comprising a body provided with a bottom discharge opening, an inclined bodily movable longitudinal door therefor closing toward the center line of the car, supports upon which said door moves, and a crank connected to the outer edge of the door and serving to support said edge when the door is closed and to lift said edge as the door moves to open position, and door moving mechanism.

16. A railway dump car comprising a body provided with a bottom discharge opening, an inclined bodily movable longitudinal door therefor, supports upon which said door moves and arranged to lower one edge of the door as it moves to open position, a longitudinal operating shaft, and cranks

thereon, one of said cranks being operatively connected to each end of the door.

17. A railway dump car comprising a body provided with a bottom discharge opening, an inclined bodily movable longitudinal door therefor, supports upon which said door moves and arranged to lower the inner edge of the door as it moves to open position, and a longitudinal operating shaft located near the outer edge of the door and provided with a crank which is operatively connected to the outer edge of the door.

18. A railway dump car comprising a body provided with a bottom discharge opening, bodily movable longitudinal doors closing toward the center line of the car, supports upon which said doors move, cranks connected to the outer edges of the doors and serving to support said edges when the doors are closed and to lift said edges as the doors move to open position, and cross connecting mechanism operatively connecting said cranks to cause them to move in unison.

19. A railway dump car comprising a body provided with a bottom discharge opening, bodily movable inclined longitudinal doors closing toward the center line of the car and meeting at their inner edges, supports upon which said doors move and arranged to lower their inner edges as they move to open position, and means connected to the outer edges of the doors and to the car body and suspending said edges and arranged to lift the same as the doors move to open position.

20. A railway dump car comprising a body provided with a bottom discharge opening, bodily movable inclined longitudinal doors closing toward the center line of the car and meeting at their inner edges, supports upon which said doors move and arranged to lower their inner edges as they move to open position, and cranks connected to the outer edges of the doors and serving to support said edges when the doors are closed and to lift said edges as the doors move to open position.

In testimony whereof, I have hereunto set my hand.

EDGAR W. SUMMERS.

Witnesses:

F. W. WINTER,

JAS. L. WELDON.