

No. 748,165.

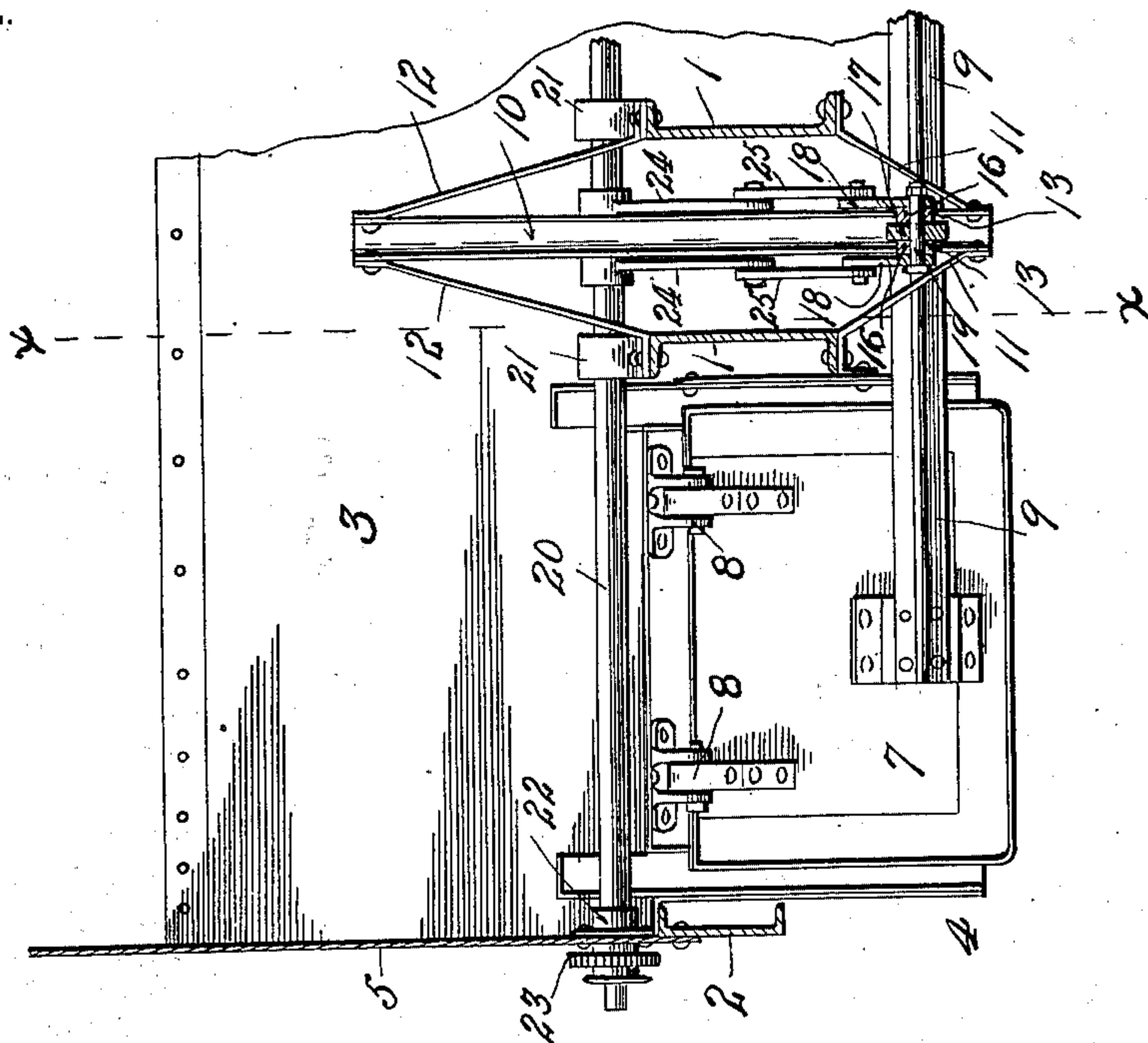
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D. C. COURTNEY.
DROP DOORS AND OPERATING MECHANISM FOR CARS.

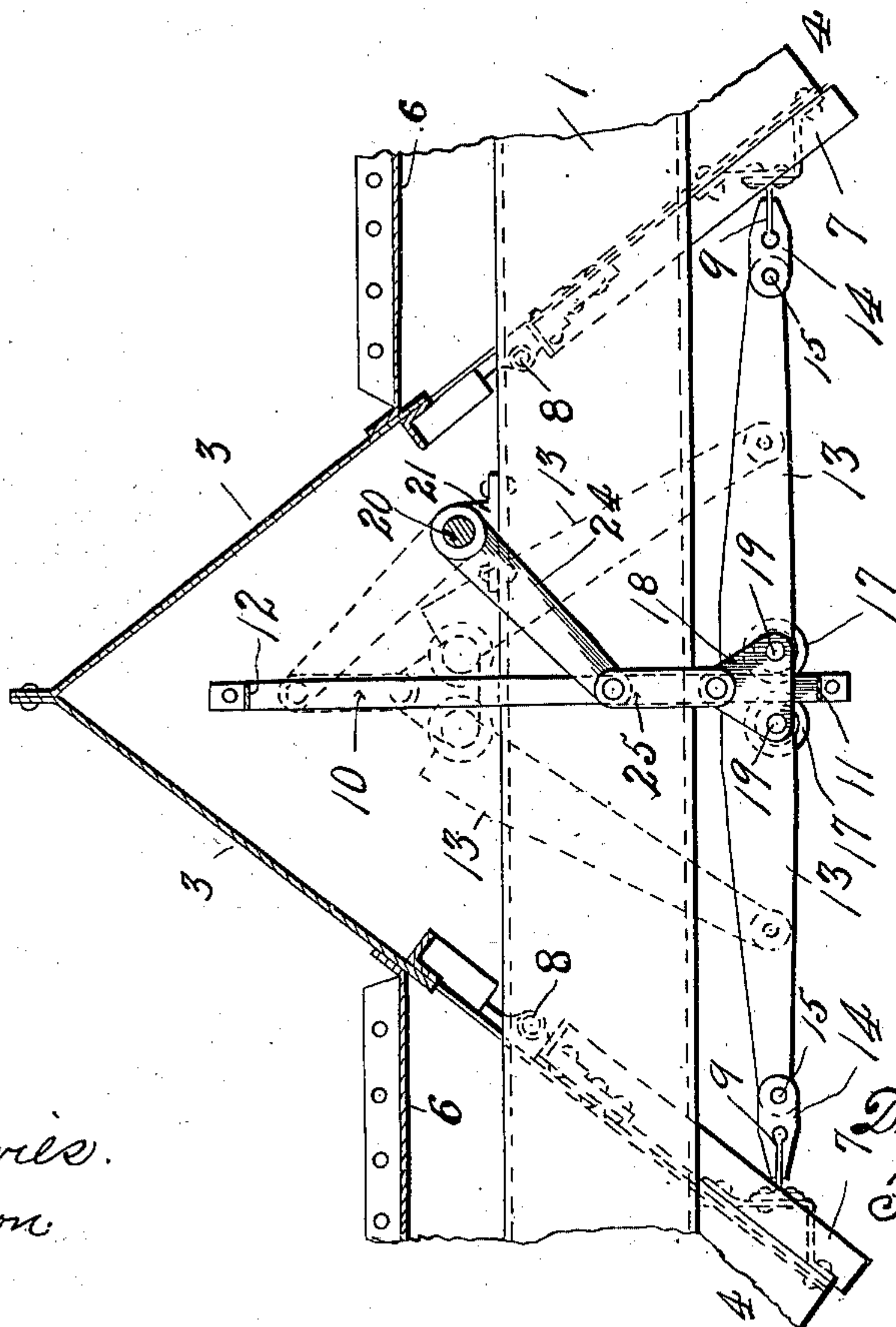
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NO MODEL.

Fig. 1.



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UNITED STATES PATENT OFFICE.

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DROP-DOORS AND OPERATING MECHANISM FOR CARS.

SPECIFICATION forming part of Letters Patent No. 748,165, dated December 29, 1903.

Application filed August 6, 1903. Serial No. 168,431. (No model.)

To all whom it may concern:

Be it known that I, DANIEL CHARLES COURTNEY, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented new and useful Improvements in Drop-Doors and Operating Mechanism for Cars, of which the following is a specification.

My invention relates to drop-doors of cars and operating mechanism for the same, the object being especially the provision of means for opening and closing the doors, which means shall be simple in construction, easily manipulated, strong and durable, and not liable to bind, and thus become inoperative, which shall be so constructed that the weight of the load pressing against the doors will tend to hold them in locked positions, which shall be provided with antifriction-rollers to facilitate operation, and which withal shall constitute a superior means for performing the desired functions.

With the above-specified main ends in view my invention consists in certain novelties of construction and combinations of parts hereinafter set forth and claimed.

The accompanying drawings illustrate an example of the physical embodiment of my invention constructed and arranged according to the best mode I have so far devised for the practical application of the principle.

Figure 1 is a cross-section of one-half of a dump or hopper-bottom car, showing the center sills, one of the side sills, the rotary operating-shaft, one of the doors, and the means for uniting a similar door upon the opposite side of the center sills. Fig. 2 is a longitudinal section of a dump or hopper-bottom car, taken on the line *x. x* of Fig. 1 and looking in the direction of the arrow, two of the doors which open toward each other being shown and also the T-iron which unites two doors upon opposite sides of the central sills.

Referring to the figures of the drawings, the numeral 1 designates the center sills, in this instance consisting of two metallic channel-beams located some distance apart and having their flanges facing outwardly; 2, one of the side sills, also consisting of a metallic channel-beam, the side sill upon the opposite side of the car being identical in con-

struction and disposition, and therefore not shown; 3, the inclined metallic floor-plates located at the center or one side of the center of the car; 4, the extreme lower portions of the hoppers; 5, one of the metallic side plates of the car-body which is secured at its lower edge to one of the side sills, the walls of the car upon the opposite side being of identical construction; 6, two deflecting-aprons located above the center sills; 7, the doors through which the load is discharged; 8, the hinges of the doors; 9, T-irons which are secured to the lower edges of the doors each side of the center sills, one of said doors being shown in full in Fig. 1, and T-iron secured thereto by a bracket; 10, an I-beam located in a vertical position between the center sills and serving, as hereinafter explained, as a guide for the rollers at the end of levers; 11, the bottom braces for the guide-beam, riveted to the flanges thereof and also to the lower flanges of the center sills; 12, the top braces, riveted to the top flanges of the center sills and also to the flanges of the guide-beam; 13, two lever-arms (shown in Fig. 2) disposed in a straight line between the doors or the T-irons which unite the doors; 14, castings secured to the T-irons which unite the doors; 15, pivotal joints between the levers and the castings; 16, the forked ends of the levers; 17, friction-rollers located at the ends of the lever; 18, two trilateral plates having holes at their lower corners through which are passed the bolts upon which the antifriction-rollers are journaled; 19, bolts passing through the trilateral plates, forked ends of the levers, and the friction-rollers; 20, a rotary operating-shaft arranged as shown; 21, bearings for the operating-shaft, secured in this instance to the top flanges of the metallic center sills; 22, a bearing for the shaft on the side sill and adjacent the metallic side wall of the car; 23, a ratchet-and-pawl mechanism; 24, two lever-arms rigidly secured to the rotary operating-shaft, and 25 designates two connecting-links pivotally secured to the lever-arms and to the two trilateral plates.

From the foregoing description, taken in connection with the drawings, it becomes obvious that I have produced a door-operating

mechanism for dump or hopper-bottom cars which fulfils all the conditions set forth as the end and purpose of my invention.

It will be observed that when the doors are closed the two lever-arms, which are properly toggle-levers, lie in a straight line and that the load pressing against the doors holds the levers in fixed positions, so that the thrust against one lever is counteracted by the thrust against the other, that the antifriction elements bear against opposite faces of the guide plate or beams, and that a slight rotary motion of the lever will raise the free ends of the levers, and that thereafter the pressure of the load will assist in opening the doors.

While I have shown but one example of the application of the principle, I do not wish to confine the scope of my invention or claims to the pictured example. I have shown a T-iron uniting two doors upon opposite sides of the central sills and one rotary shaft for operating all the doors, whereas in practice I may use two shafts and apply the mechanism so that two doors upon one side of the center sills may be simultaneously opened and closed. Again, I may employ a second shaft to operate pairs of doors upon opposite sides of the sills. These and other changes and modifications in the application of the principle I shall consider as falling within the scope of my claims when the principle or mode of operation is embodied for the same purpose or for attaining the same ends.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a car center and side sills, of a rotary shaft supported in bearings; rigid lever-arms on the shaft; links pivoted to the ends of the lever-arms; trilateral plates pivoted to the links; an I-beam guide; means uniting doors upon opposite sides of the center sill; and toggle-levers each secured to the doors at one end and at the other end provided with an antifriction-roller which frictionally engages the I-beam guide; said trilateral plates being secured to the ends of the antifriction-roller bearings, in substance as set forth.

2. The combination with a hopper-bottom car, of a rotary shaft; lever-arms rigidly secured to the shaft; links pivoted to the lever-arms; a car-door; a lever pivoted to the car-door; an antifriction-roller at the free end of the lever; a guide having a surface to be engaged by the roller; and means connecting the end of the lever and the links which are pivoted to the lever-arm on the shaft.

3. The combination with a car, of a rotary shaft; a door; a lever pivoted to the door; an antifriction-roller at the free end of the lever; a stationary guide for the roller; and means

located between the rotary shaft and the lever which is pivoted to the door for moving the lever in opening or closing the door.

4. The combination with a car, of two doors on opposite sides of the center sills; means uniting the doors so that they will move simultaneously; a lever pivoted to the means which unites the two doors; an antifriction-roller at the end of the lever; a guide for the roller; a rotary shaft; and means uniting the rotary shaft and the lever whereby the latter may be moved.

5. The combination with a car-door and operating mechanism, of a lever secured to the door and having an antifriction-roller at its free end; a guide for the roller; and means for moving the free end of the lever and opening or closing the door.

6. The combination with a car, of two pairs of doors; means for uniting each pair so they may move simultaneously; a vertical guide; two lever-arms pivoted to the means uniting the pairs of doors; antifriction-rollers at the free ends of the levers; a rotary shaft; and means uniting the ends of the levers and rotary shaft whereby the free ends of the shaft may be raised and lowered.

7. The combination with a car of a rotary shaft; lever-arms secured to the shaft; two links; two trilateral plates secured to the links; a vertical guide; toggle-levers in connection with the doors; and a roller at the free end of each toggle-lever and engaging the guide; said trilateral plates being secured to the ends of the toggle-levers.

8. The combination with a car, of four doors arranged in pairs and means uniting each pair, said pairs of doors swinging toward each other in opening; two lever-arms pivoted to the means uniting the pairs of doors; an antifriction-roller at the free end of each lever; a guide located between the rollers; and means for moving the levers from positions where they are in line to positions where they are at an angle to each other, and vice versa.

9. The combination with a car of doors 7; T-irons 9 uniting the doors in pairs; a guide 10; levers having forked ends; castings secured to the T-irons and to which the levers are pivoted; antifriction-rollers at the ends of the levers; a rotary shaft; two arms on the shaft; links; and means uniting the links and levers which carry the antifriction-rollers.

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

DANIEL CHARLES COURTNEY.

Witnesses:

BURNS ISNER,
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