

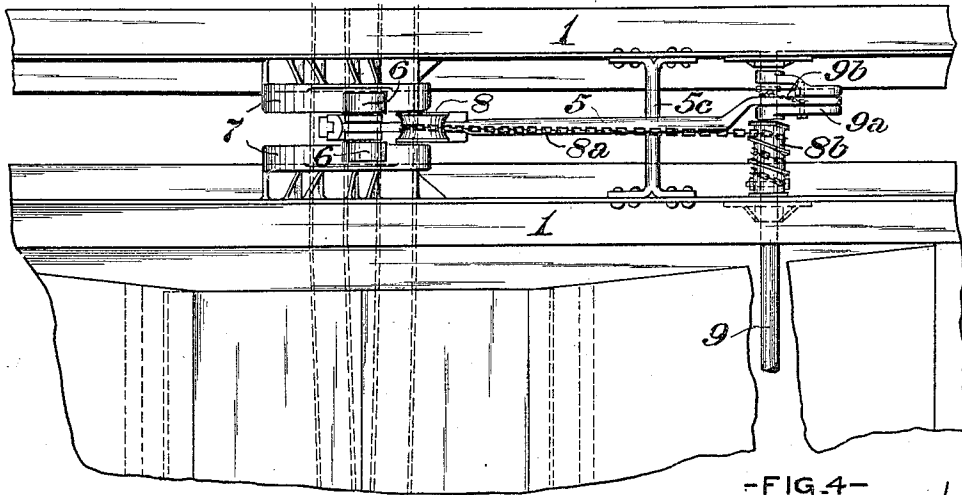
F. W. MARTIN.
DOOR OPERATING MECHANISM FOR GONDOLA CARS.
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993,389.

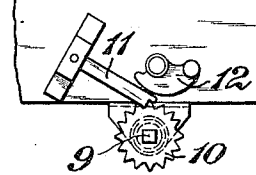
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2 SHEETS-SHEET 1.

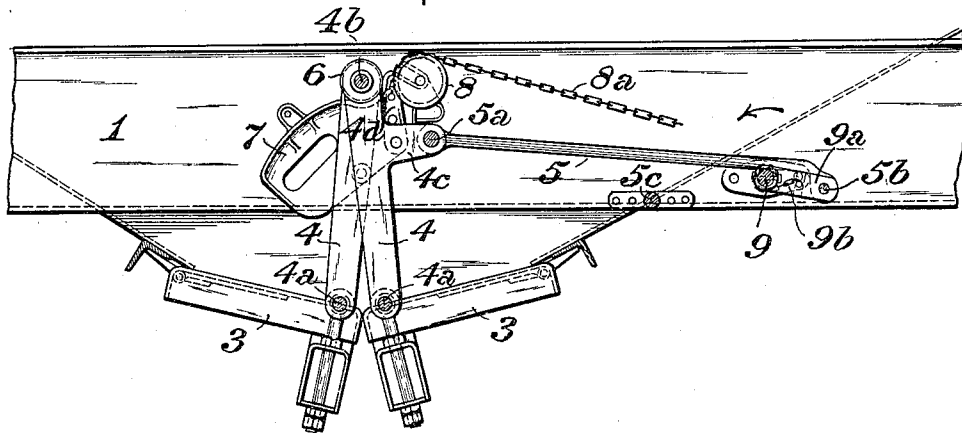
-FIG. 1 -



-FIG. 4 -



-FIG. 2 -



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2 SHEETS--SHEET 2.

Fig. 1 is a perspective view of a mechanical component, likely a bracket or arm. It features a cylindrical end with a flange (9) and a threaded hole (9a). The component is labeled with 5, 5b, 9, 9a, and 9b.

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DOOR-OPERATING MECHANISM FOR GONDOLA CARS.

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To all whom it may concern:

Be it known that I, FREDERICK W. MARTIN, of the borough of Manhattan, in the city, county, and State of New York, have
5 invented a certain new and useful Improvement in Door-Operating Mechanism for Gondola Cars, of which improvement the following is a specification.

My invention relates to mechanism for effecting the opening and closure of the swinging doors controlling the bottom openings of so-called "drop bottom" gondola cars, and its object is to provide an appliance of such character which shall be simple and inexpensive in construction, and which, in
15 operation, shall present the advantages of securely holding the doors in closed position by a positive and effective gravity lock, and of permitting their release and movement
20 into full open position without involving danger to the operator by sudden and rapid movement of the member which is manually operated to release them.

The improvement claimed is hereinafter
25 fully set forth.

In the accompanying drawings: Figure 1 is a plan or top view of a portion of a gondola car, illustrating an application of my invention; Fig. 2, a side view, in elevation,
30 of my improved mechanism the parts being shown with the doors locked in closed position; Fig. 3, a similar view, showing the doors in open position; Fig. 4, a side view, in elevation, of the final locking means of
35 the doors; and Fig. 5, a transverse section, on an enlarged scale, through the operating shaft and the pin of the crank thereon.

In the practice of my invention, the operating mechanism is preferably, as shown,
40 located between and supported on the center sills, 1, 1, of a gondola car having bottom discharge openings, each of which is closed by a pair of oppositely swinging hinged doors, 3, 3. Links, 4, 4, are coupled at their
45 lower ends, by pivots, 4^a, to the doors, 3, 3, and their upper ends are journaled on a pin, 4^b, upon the ends of which, adjacent to the links, are fixed rollers, 6, 6, which, when the doors are closed, rest in segmental recesses or
50 seats, 7^a, formed in curved locking brackets, 7, secured to the sills, 1, 1, over the downwardly extending faces of which the rollers traverse in the opening movement of the doors. A laterally extending arm, 4^c, is
55 formed on one of the links, 4, near its upper end, and is coupled, by a pin, 5^a, to one end

of a connecting rod, 5, the opposite end of which is coupled, by a pin, 5^b, to a crank, 9^a, which is fitted to turn freely on an operating shaft, 9, journaled in bearings in the sills, 1, 1, and having a squared end for the application of a wrench by which it is manually
60 rotated.

A sheave, 8, is journaled in bearings in the locking brackets, 7, and a chain, 8^a,
65 passes over said sheave, and is secured, at its end adjacent thereto, to a short link, 4^d, pivoted to the arm, 4^c, of one of the door links, 4. The opposite end of the chain, 8^a, is secured to a drum, 8^b, fixed on the operating shaft, 9, around which drum, convolutions of the chain are wound, when the doors are in closed position. A short chain, 9^b, is
70 secured at one end to the crank, 9^a, and after being wound once around the operating shaft, 9, its opposite end is secured thereto. A ratchet wheel, 10, is fixed upon the operating shaft, and rotation of the latter is prevented when the teeth of the ratchet
75 wheel are engaged by a pivoted pawl or latch, 11, which is held in engagement with the ratchet wheel by a swinging locking cam, 12, pivoted to the side of the car, above the ratchet wheel. A transverse supporting
80 bar, 5^c, is secured to the sills, 1, 1, below the connecting rod, 5, and between the operating shaft and the adjacent door.

The operation of opening the doors to discharge the load is as follows. The locking cam, 12, is thrown up to the right; the pawl, 11, is disengaged from the ratchet, 10; a crank or wrench is placed on the squared end of the operating shaft, 9, outside of the car; and the operating shaft is turned by
85 the crank in the direction of the arrow, Fig. 2. This movement unwinds the chain, 8^a, from the drum, 8^b, and also unwinds the short chain, 9^b, from the operating shaft. In the continued movement of the operating shaft, the short chain, 9^b, will again wind
90 itself thereon, at which time, the door link chain, 8^a, will be completely unwound from the drum, 8^b. As the movement of the operating shaft is continued, the short chain, 9^b, becomes taut between its end connections
95 to the operating shaft and the crank, 9^a, respectively, and thereby causes the crank to rotate with the shaft. When the doors are in closed position, the crank, 9^a, is downwardly inclined, so that its pin, 5^b, stands
100 below the center line of the operating shaft, as shown in Fig. 2, and in the continued

movement of the operating shaft, the crank pin, 5^b, is raised above the center line of said shaft, and the connecting rod, 5, which is coupled to said crank pin, moves the upper ends of the links, 4, 4, to the left, thereby releasing the rollers, 6, from their seats, 7^a, in the locking brackets, 7, and permitting the doors, 3, 3, to drop into open position by their own gravity and that of the load in the car bearing on them. By reason of the door chain, 8^a, having been unwound from the drum, 8^b, the running out of the slack of said chain prevents the movement of the doors from exerting any sudden shock or strain on the operating shaft and obviates any risk of injury to the operator. When the doors are open, the supporting bar, 5^c, prevents the connecting rod, 5, and crank, 9^b, from dropping below the center line of the operating shaft, and swinging to the right thereof which result, if permitted, would draw the rollers, 6, so far to the right as would prevent them from riding up over the curved surfaces of the locking brackets, 7, and thereby prevent the closing of the doors.

In order to close the doors, the operating shaft, 9, is rotated in the opposite direction, thereby raising the doors, through its connection therewith by the door chain, 8^a, and links, 4, 4, and causing the rollers, 6, to ride up the surfaces of the locking members, 7, until they rest in the seats, 7^a, the chain, 8^a, being, by the rotation of the operating shaft, wound upon the drum, 8^b. While the door chain, 8^a, is being wound up, the short chain, 9^b, is first unwound from the operating shaft and thereafter again wound thereon in the opposite direction, thereby becoming taut and drawing the crank, 9^a, into the downwardly inclined locked position shown in Fig. 2. The supporting bar, 5^c, prevents the crank, 9^a, from being moved into this

position while the doors are being raised, which movement, if it occurred, would prevent the rollers, 6, from passing the left hand ends of the locking brackets, 7, and would consequently prevent the closing of the doors.

I claim as my invention and desire to secure by Letters Patent:

1. In a car door operating mechanism, the combination of a gravity opening door, an operating shaft journaled in fixed bearings on a car, a crank fitted to turn upon said shaft, a flexible connection wound upon said shaft and coupling said crank thereto, a curved faced locking bracket fixed on the car and having a seat at its top, a link coupled to the door and having a roller on its opposite end adapted to travel over the face of the locking bracket, a connecting rod coupled to said link and to the operating shaft crank, and a flexible connection coupled to said link and to the operating shaft.

2. In a car door operating mechanism, the combination of a gravity opening door, an operating shaft journaled in fixed bearings on a car, a crank fitted to turn upon said shaft, a flexible connection wound upon said shaft and coupling said crank thereto, a curved faced locking bracket fixed on the car and having a seat at its top, a link coupled to the door and having a roller on its opposite end adapted to travel over the face of the locking bracket, a connecting rod coupled to said link and to the operating shaft crank, a transverse supporting bar fixed to the car below said connecting rod, and a flexible connection coupled to said link and to the operating shaft.

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Witnesses:

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