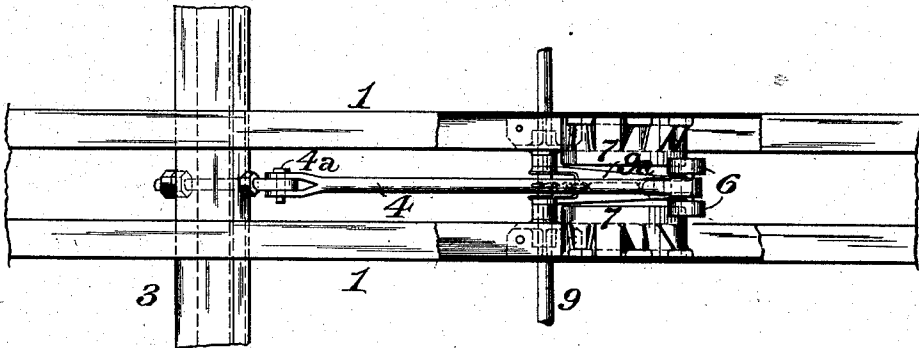


F. W. MARTIN.
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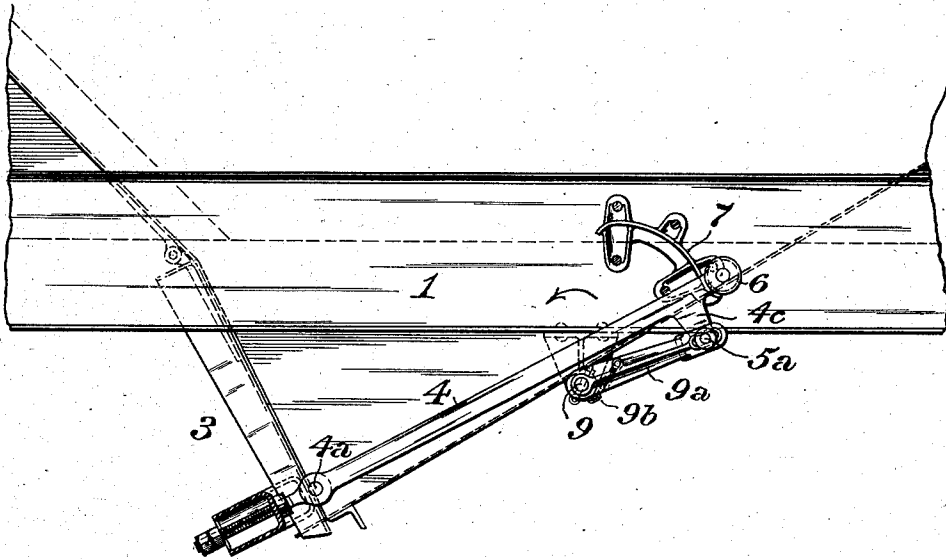
1,012,092.

Patented Dec. 19, 1911.

2 SHEETS—SHEET 1.



-FIG. 1-



-FIG. 2-

WITNESSES
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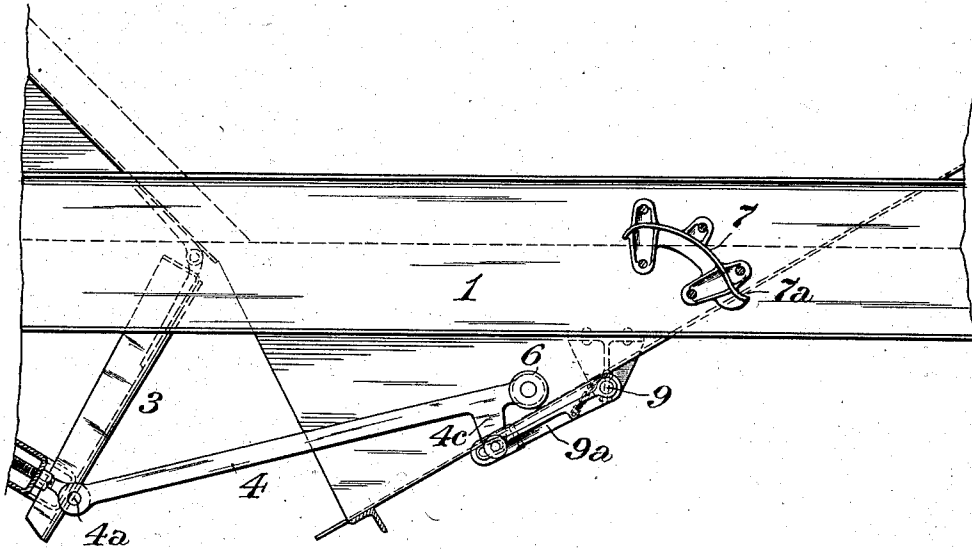
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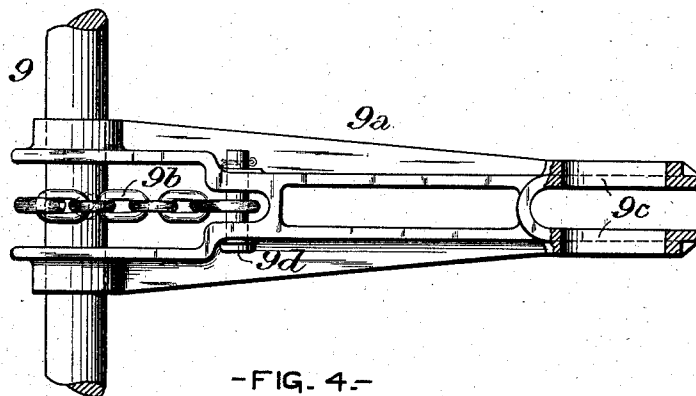
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2 SHEETS-SHEET 2.



-FIG. 3.-



-FIG. 4.-

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UNITED STATES PATENT OFFICE.

FREDERICK W. MARTIN, OF NEW YORK, N. Y.

DOOR-OPERATING MECHANISM FOR HOPPER-CARS.

1,012,092.

Specification of Letters Patent.

Patented Dec. 19, 1911.

Application filed September 21, 1911. Serial No. 650,558.

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 invented a certain new and useful Improvement in Door-Operating Mechanism for Hopper-Cars, of which improvement the following is a specification.

My present invention relates to mechanism for effecting the opening and closure of the swinging doors controlling the bottom openings of hopper cars, and is an improvement upon that for which Letters Patent of the United States No. 993,389 were granted and issued to me under date of May 30, 1911.

The object of my invention is to provide an appliance of this general type which shall be of simplified construction, and which, in operation, shall present the advantages of securely holding the doors in closed position by a simple and effective gravity lock, and of permitting their release and movement 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 fully set forth.

In the accompanying drawings: Figure 1 is a plan or top view of a portion of the center sills of a hopper car, illustrating an application of my invention; Fig. 2, a side view, in elevation, of my improved mechanism, the parts being shown with the door locked in closed position; Fig. 3, a similar view, showing the door in open position; and, Fig. 4, a plan view, partly in section and on an enlarged scale, of the arm of the operating shaft.

In the practice of my invention, the operating mechanism is preferably, as shown, located between and supported on the center sills, 1, 1, of a hopper car having a bottom discharge opening which is closed by an outwardly swinging hinged door, 3. A link, 4, is coupled, at its lower end, by a pin, 4^a, to the door, 3, and has journaled on its upper end, a pair of rollers, 6, which, when the door is closed, rest in segmental recesses, 7^a, at the lower ends of curved locking brackets, 7, secured to the sills, 1, 1, over the upwardly extending faces of which brackets the rollers, 6, traverse in the opening movement of the door. A laterally extending arm, 4^c, formed on the link, 4, near its upper end, is directly coupled, by a pin, 5^a, to an arm, 9^a,

which is journaled freely on an operating shaft, 9, mounted in bearings in the sills, 1, 1, between the locking brackets and the door, and having a squared end for the application of a wrench by which it is manually rotated. The arm, 9^a, normally projects from the shaft in the direction of the locking brackets, and the pin, 5^a, is fitted in short longitudinal slots, 9^c, in the end of the arm, 9^a, so as to permit a limited degree of movement of the link, 4, relatively thereto. A short chain, 9^b, is secured at one end to, and partially wound around, the operating shaft, 9, and its opposite end is secured to a pin, 9^d, fixed in the arm, 9^a.

The operating shaft, 9, is preferably locked in position by a pawl and ratchet device provided with a swinging locking cam, substantially as shown in Letters Patent No. 993,389 aforesaid, but as such device does not constitute part of my present invention, and is not essential to its operation, it is not herein illustrated.

The operation of opening the door to discharge the load is as follows. A crank or wrench is placed on the squared end of the operating shaft, outside of the car, and the operating shaft is turned in the direction of the arrow, Fig. 2, which movement will first unwind the chain, 9^b, from the operating shaft, and thereafter wind it thereon in the opposite direction, the chain becoming, as the movement of the shaft continues, taut between its end connections to the arm, 9^a, and the shaft, respectively, and thereby causing the former to rotate with the latter. In the continued movement of the operating shaft, the arm, 9^a, raises the link 4, the rollers, 6, thereof traveling upwardly over the surfaces of the locking brackets, 7, until they are released from the upper ends thereof, when the weight of the door, 3, and the load bearing on it, will cause the parts to drop into the position shown in Fig. 3, in which the door is fully open for the discharge of the load. As the arm follows the movement of the link and door, it unwinds the chain, 9^b, from the operating shaft, and continues its movement without moving the same, thereby preventing the movement of the door from exerting any sudden strain or shock on the operating shaft and obviating any risk of injury to the operator. In order to close the door, the operating shaft is rotated in the opposite direction, rewinding the chain, 9^b, upon it, and raising the link and door until

the rollers, 6, contact with the upper ends of the locking brackets, 7, after which the parts are brought by gravity into the positions shown in Fig. 3, in which the door is closed, and is held closed by the bearing of the rollers, 6, on the lower end recesses, 7^a, of the locking brackets, 7.

It will be seen that the appliance attains, under a substantially simplified construction, the advantages of direct and positive action and absolute immunity to the operator from injury by shock due to the rapid movement of the door in being released from closed position.

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, a curved face locking bracket fixed to a car and having a seat at its bottom, a link coupled to the door and having a roller on its opposite end adapted to travel over the face of the locking bracket, an operating shaft journaled in bearings on the car, an

arm fitted to turn upon said shaft and coupled directly, at its outer end, to the door link, and a flexible connection wound upon said shaft and coupling said arm thereto.

2. In a car door operating mechanism, the combination of a gravity opening door, a curved face locking bracket fixed to a car and having a seat at its bottom, a link coupled to the door and having a roller on its opposite end, adapted to travel over the face of the locking bracket, an operating shaft journaled on the car between the locking bracket and door, an arm journaled on said shaft and normally projecting therefrom in the direction of the locking bracket, a pin coupling said arm, at its outer end, to the door link, and a flexible connection wound upon said shaft and coupling said arm thereto.

FREDERICK W. MARTIN.

Witnesses:

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MARY G. DONOVAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."