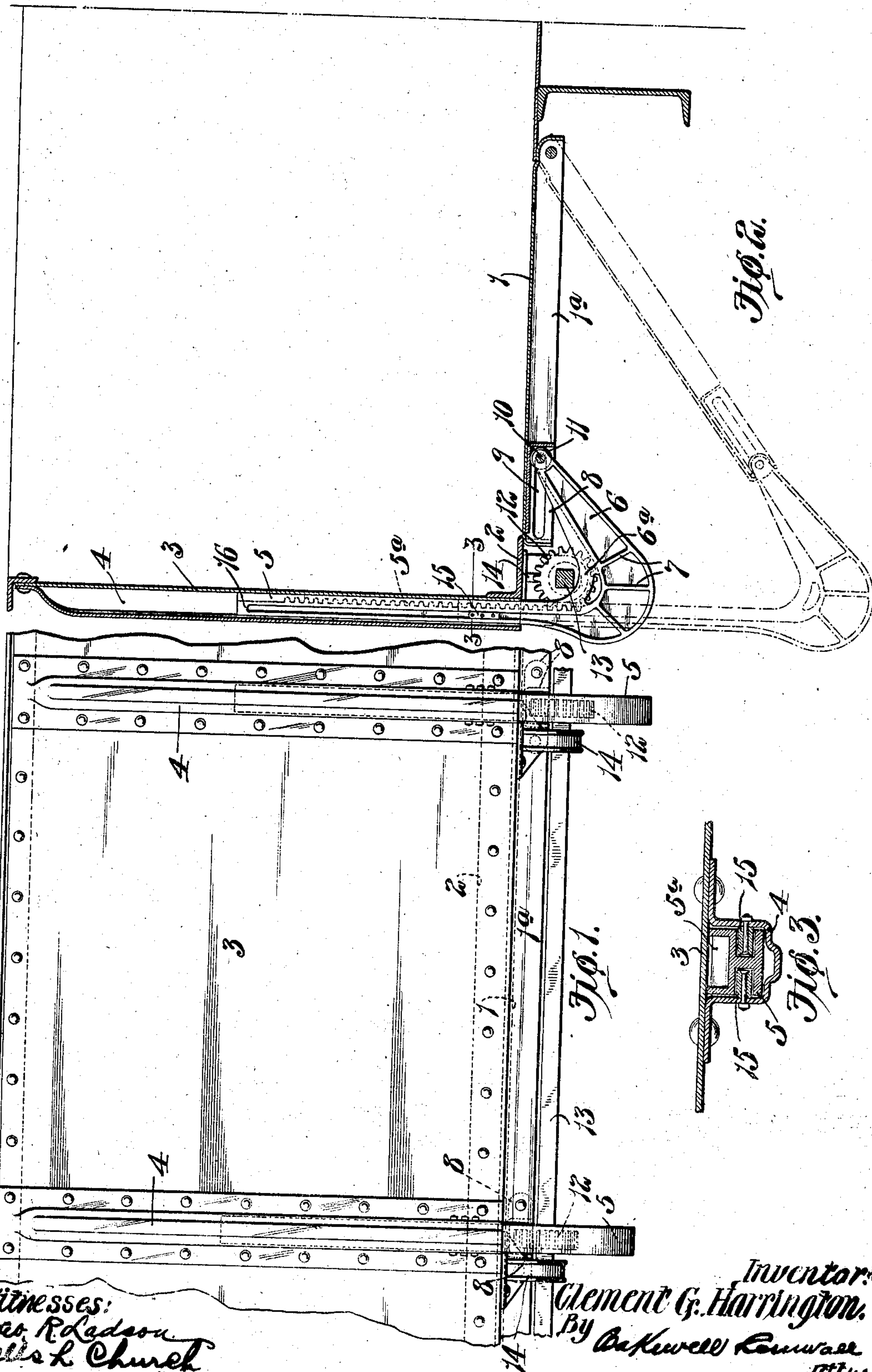


No. 881,857.

C. G. HARRINGTON. PATENTED MAR. 10, 1908.
DOOR OPERATING MECHANISM FOR CARS.
APPLICATION FILED NOV. 11, 1907.



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UNITED STATES PATENT OFFICE.

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DOOR-OPERATING MECHANISM FOR CARS.

No. 881,857.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed November 11, 1907. Serial No 401,653.

To all whom it may concern:

Be it known that I, CLEMENT G. HARRINGTON, a citizen of the United States, residing at Maplewood, Missouri, have invented a certain new and useful Improvement in Door-Operating Mechanism for Cars, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a portion of a gondola car provided with a door-operating mechanism constructed in accordance with my invention; Fig. 2 is a transverse sectional view of one half of the car shown in Fig. 1; and Fig. 3 is an enlarged detail sectional view taken on the line 3—3 of Fig. 2.

This invention relates to dump cars, and particularly to the mechanism employed in such cars for actuating the doors which close the discharge openings in the body of the car.

The main object of my invention is to provide a door-operating mechanism of simple construction that will positively control the movements of the door with which it is used and which will not be apt to jam or get out of order quickly.

Another object of my invention is to provide a car door-operating mechanism that can be manufactured at a small cost and which comprises few parts and does not project laterally beyond the sides of the car. And still another object of my invention is to provide a door-operating mechanism comprising actuating bars that are reciprocatingly mounted in hollow side stakes secured to the side walls of the car.

I have herein shown my improved door-operating mechanism applied to a gondola car provided in its bottom with doors that are hinged adjacent the center sills of the car, and referring to the drawings which illustrate the preferred form of my invention, I designate a drop door that closes a discharge opening in the bottom of the car, said door being hinged at its inner end adjacent the center sills of the car and having its outer edge extending parallel to and contacting with an angle 2 secured to the lower edge of the plate girder side wall 3 of the car. Hollow side stakes 4, preferably formed of

pressed metal, are secured to the outside face of the side wall 3 and actuating bars 5 are reciprocatingly mounted in said stakes, the lower ends of the side stakes being open and the upper ends being closed. Each of the actuating bars 5 is provided at its lower end with an inwardly projecting arm 6, preferably disposed at approximately an acute angle relatively to the bar and the inner ends of these arms have a sliding connection with the drop door 1. I prefer to form the arm 6 integral with the bar 5 and strengthen it at the point where it curves upwardly from the bar by means of ribs 7, the bar 5 and arm 6 both being substantially I-shaped in cross section. The door 1 is preferably formed of pressed metal and is provided with an integral downwardly projecting flange 1^a and the portion of the flange at the outer edge of the door is cut away to provide a clearance for the arms 6 of the actuating bars, two of said actuating bars being provided for each door. Box-shaped metal members 8 are secured to the underneath side of the door adjacent the outer edge thereof and the side walls of said members are provided with elongated slots 9 that receive cross pins 10 in the arms 6, as shown in Fig. 2 each of said pins being provided with a roller 11 that is arranged between jaws on the inner end of the arm 6.

Each of the bars 5 is provided on its inner face with rack teeth 5^a that cooperate with a pinion 12 on an operating shaft 13 arranged longitudinally of the car, said shaft being journaled in bearings 14 that are fastened to the angle 2 on the lower edge of the plate girder side wall 3. I also prefer to provide the arms 6 on their upper sides with side flanges 6^a that partially incase the pinions 12 when the door is closed, said flanges merging into the bars 5 and thus strengthening the arms. A handle or other suitable device, not shown, may be connected to the operating shaft 13 at the end of the car for rotating same, and means is also provided for locking the shaft such, for example, as a pawl and ratchet of the type operating shafts are usually provided with.

As previously stated, the actuating bars 5 are substantially I-shaped in cross section and said bars are guided and limited in their downward movement by means of stops 15 connected to the side stakes 4 and projecting

into the channels or spaces between the flanges of the bars, as shown in Fig. 3, the bars being provided adjacent their upper ends with shoulders or cross webs 16 that contact with the stops 15 and thus limit the downward movement of the bars. When the contents of the car is to be discharged the operating shaft is turned so as to move the actuating bars downwardly and thus open the door, as shown in broken lines in Fig. 2, the pins 10 in the arms 6 sliding in the elongated slots 9 in the members on the door and thus providing a sliding connection between the door and the arms 6. To close the door the operating shaft is rotated in the reverse direction thereby moving the actuating bars upwardly and thus returning the door to the position shown in full lines in Fig. 2.

A door-operating mechanism of this construction comprises few parts so that it can be manufactured cheaply, it does not project laterally beyond the sides of the car so that it does not increase the width of the car, and as the actuating bars are incased in the side stakes and the operating shaft and its pinions are located close to the bottom of the car, these parts cannot become coated with snow or ice that would cause the mechanism to jam and thus prevent the door from being opened. Furthermore, there is a positive connection between the door and the actuating bars so that the mechanism is more efficient than a door-operating mechanism which comprises chains or links.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A car provided with a door, a vertically disposed actuating bar, an arm rigidly connected to said bar and projecting underneath the door when it is closed so as to support same, and means for reciprocating said actuating bar; substantially as described.

2. A car provided with a hinged door, a vertically disposed actuating bar, a rigid arm on said bar having a sliding connection with said door and projecting underneath same when in its closed position, and means for moving said bar; substantially as described.

3. A car provided with a hinged door closing an opening in the bottom of the car and having its front edge arranged parallel to the side wall of the car, a vertically disposed actuating bar provided with a rigid arm that is connected to the door adjacent the front edge thereof, and means for reciprocating said bar to open and close the door; substantially as described.

4. A car provided with a hinged door that closes an opening in the bottom of the car, an actuating bar arranged on one of the vertical walls of the car and provided with rack teeth and a rigid arm that projects underneath the bottom of the car and is connected to said

door, and an operating shaft provided with a pinion that meshes with the rack teeth on said bar; substantially as described.

5. A car provided with a drop door that closes an opening in the bottom of the car, a vertically disposed actuating bar provided with a rigid arm that projects underneath the outer edge of the door, and means for operating said bar; substantially as described.

6. A car provided with a hinged door the outer edge of which extends parallel to the side wall of the car, an actuating bar carried by the side wall of the car, an arm on said bar which projects underneath the door, and means for moving said bar to open and close the door; substantially as described.

7. A car provided with a hinged door, an actuating bar, an arm on said bar which projects underneath the outer edge of the door, a device on said arm which enters a slotted member on the door, and means for moving said actuating bar; substantially as described.

8. A car provided with a hinged door, an actuating bar provided at its lower end with an integral arm that projects underneath the outer edge portion of the door, a slotted member on the door, and a device on said arm which coöperates with said slotted member to form a sliding connection between the arm and door; substantially as described.

9. A car provided with a door having a hinge which extends longitudinally the center sills of the car, an actuating bar carried by the side wall of the car, an arm on the lower end of said bar disposed at approximately an acute angle relatively to said bar and slidingly connected at its inner end to said door, and means for moving said bar; substantially as described.

10. A car provided with a side wall having side stakes secured thereto, a door closing an opening in the bottom of the car, a vertically disposed actuating bar arranged in one of said side stakes and connected to the door, and means for reciprocating said bar longitudinally of the side stake; substantially as described.

11. A car provided with a side wall having side stakes connected thereto, a hinged door closing an opening in the bottom of the car, an actuating bar reciprocatingly mounted in one of said side stakes, an arm projecting inwardly from the lower end of said bar and connected to said door, and means for moving said bar; substantially as described.

12. A car provided with a door which closes an opening in the bottom of the car, side stakes connected to the side walls of the car, and vertically disposed members arranged inside of said stakes for moving the door; substantially as described.

13. A car provided with a door which closes an opening in the bottom of the car, a side wall having hollow side stakes secured thereto, and reciprocating members arranged

vertically in some of said stakes for opening and closing the door; substantially as described.

14. A car provided with a hinged door which closes an opening in the bottom of the car, side stakes secured to the side walls of the car, actuating bars reciprocatingly mounted in some of said side stakes and provided at their lower ends with inwardly projecting arms that are slidingly connected to said door, and means for operating said bars; substantially as described.

15. A car provided with a drop door and side stakes connected to the side wall of the car, rack bars mounted in said side stakes and connected to said door, and a longitudinally extending operating shaft provided with pinions that mesh with said rack bars; substantially as described.

16. A car having a door which closes an opening in the bottom of the car, side stakes connected to the side walls of the car, a rack bar mounted in one of said side stakes and provided at its lower end with an inwardly projecting arm that is connected to the door, an operating pinion meshing with said rack bar, and flanges on said arm which partially incase said pinion when the door is closed; substantially as described.

17. A car having a door which closes an opening in the bottom of the car, a vertically disposed actuating bar carried by the side wall of the car and connected to said door, means for moving said bar, and a stop for limiting the downward movement of the bar; substantially as described.

18. A car provided with a hinged door, hollow side stakes secured to one of the side walls of the car, actuating bars approximately I-shaped in cross section arranged in some of the side stakes of the car and provided at their lower ends with arms that are connected to the door, and stops on said side stakes for guiding the bars and limiting the downward movement thereof; substantially as described.

19. A car provided with a hinged door that closes an opening in the bottom of the car, rack bars carried by the side wall of the car and provided at their lower ends with integral inwardly projecting arms that have a sliding connection with the door, and a longitudinally extending operating shaft provided with pinions that mesh with said rack bars; substantially as described.

20. A car provided with a hinged door that closes an opening in the bottom of the

car, hollow pressed metal side stakes secured to the side wall of the car and having their upper ends closed and their lower ends open, rack bars reciprocatingly mounted in some of said side stakes, rigid arms that project inwardly from the lower ends of said bars, pins on said arms that enter elongated slots in members secured to the underneath side of the door, rollers mounted on said pins, and a longitudinally extending shaft arranged underneath the bottom of the car and provided with pinions that mesh with said rack bars; substantially as described.

21. A car provided with a pressed metal door that closes an opening in the bottom of the car, hollow pressed metal side stakes secured to the side wall of the car, actuating bars reciprocatingly mounted in some of said stakes and provided at their lower ends with integral arms that are disposed at approximately an acute angle with relation to the bars, members connected to the door and provided with elongated slots which receive pins on said arms, an operating shaft provided with pinions that mesh with rack teeth on said bars, and flanges on said arms that partially incase said pinions when the door is closed; substantially as described.

22. A car door operating mechanism consisting of a vertically disposed metallic rack bar provided at its lower end with an integral arm which projects laterally underneath the bottom of the car and is adapted to be connected to a door arranged in the bottom of the car and an operating shaft provided with a pinion that meshes with said rack bar; substantially as described.

23. A car door operating mechanism consisting of a vertically disposed metallic rack bar provided at its lower end with an integral laterally projecting arm that is adapted to be connected to a door, strengthening ribs at the point where the arm is connected to the bar, side flanges on the upper side of said arm which merge into the rack bar, and an operating shaft provided with a pinion that meshes with said rack bar; substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this ninth day of November 1907.

CLEMENT G. HARRINGTON.

Witnesses:

WELLS L. CHURCH,
GEORGE BAKEWELL.