

C. J. REHLIN.
CAR DOOR OPERATING MECHANISM.
APPLICATION FILED NOV. 17, 1909.

954,698.

Patented Apr. 12, 1910.

2 SHEETS—SHEET 1.

FIG. 1.

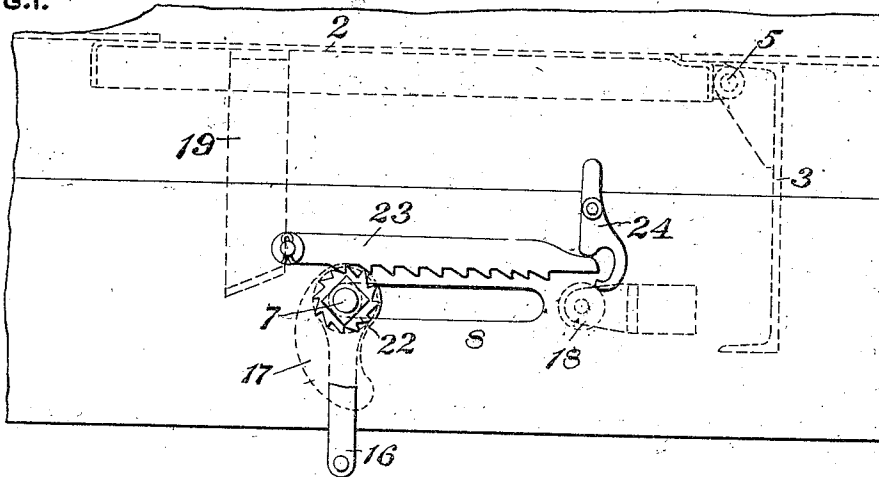


FIG. 2.

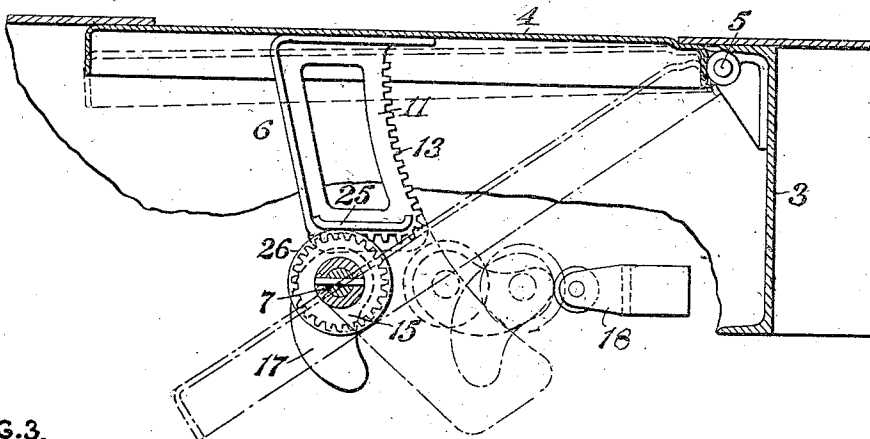
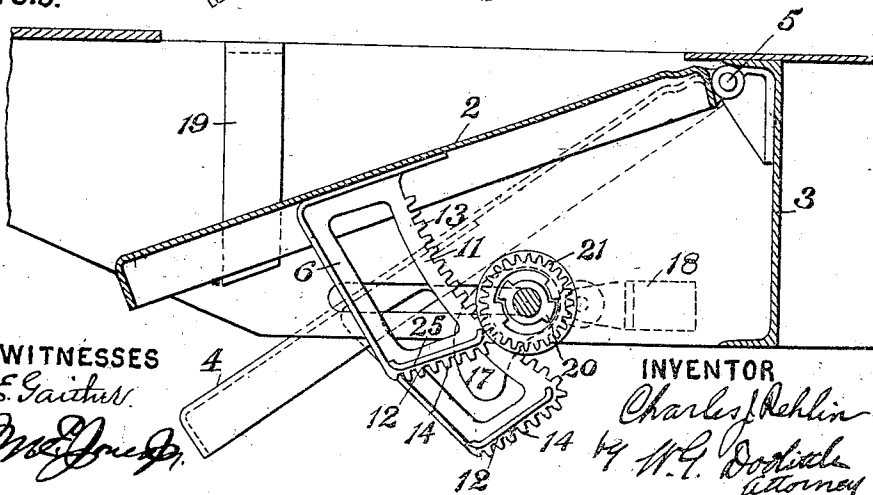


FIG. 3.



WITNESSES

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2 SHEETS—SHEET 2.

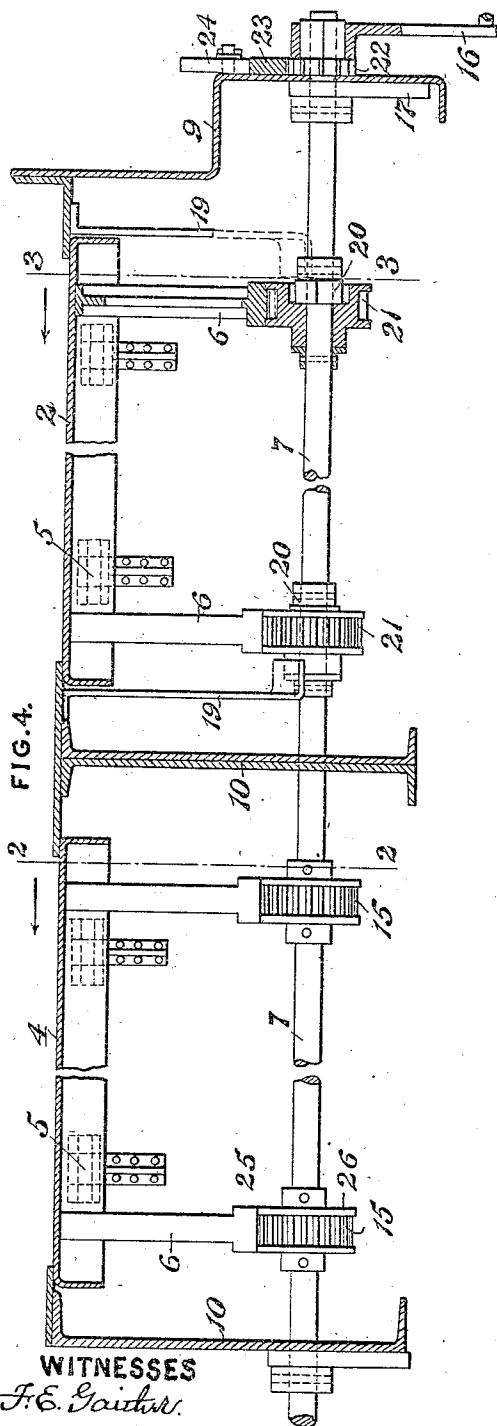


FIG. 4.

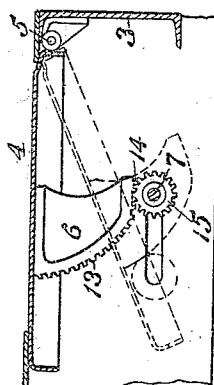
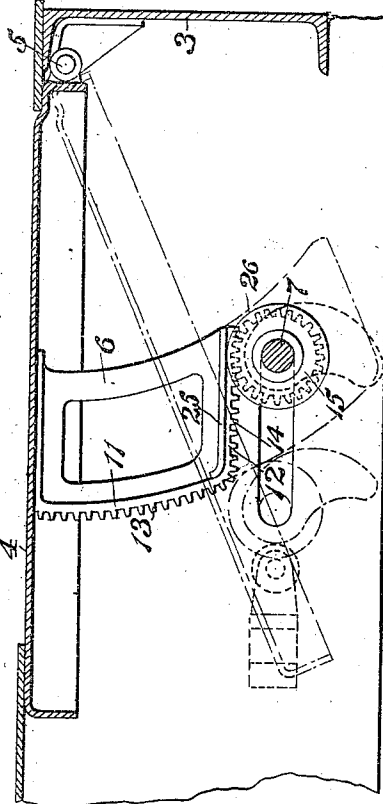


FIG. 5.



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UNITED STATES PATENT OFFICE.

CHARLES J. REHLIN, OF PITTSBURG, PENNSYLVANIA.

CAR-DOOR-OPERATING MECHANISM.

954,698.

Specification of Letters Patent.

Patented Apr. 12, 1910.

Application filed November 17, 1909. Serial No. 528,603.

To all whom it may concern:

Be it known that I, CHARLES J. REHLIN, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Car-Door-Operating Mechanism, of which the following is a specification.

My invention relates to railway dump-cars and more particularly, to a new and improved door operating and supporting mechanism for the dumping or discharge doors of cars of this type.

In the accompanying drawings, which illustrate applications of my invention, Figure 1 is an end view of a portion of a car embodying my invention; Fig. 2 a part elevational and a part sectional view particularly showing the door operating mechanism, the section being taken on line 2—2 of Fig. 4; Fig. 3 a similar view, the section being taken on line 3—3 of Fig. 4; Fig. 4 a part elevational view and a part longitudinal sectional view showing two doors and operating mechanism; Fig. 5 a transverse sectional view showing a modified form of depending-member or rack carried by the door; and Fig. 6 a detail elevational view of a further modified form of depending-member.

I have shown my invention embodied in a dump-car of the type having a floor formed almost entirely of hinged doors; these doors being arranged on each side of the car center-sill and preferably hinged in series and operated from each corner of the car. As illustrated, I have shown only two doors, one door 2 being an end door of one row of doors on one side of the center-sill 3, and 4 one of the intermediate doors of the same row. These doors are each hinged along the sides of the center-sill on hinges 5 and are each provided with a depending-member 6 secured to and movable with the door. Member 6 is adapted to co-operate with a rotatable and bodily movable shaft 7, which latter extends longitudinally of the car and is supported in fixed slotted bearings 8 secured to or formed in the end-sill 9 and transverse members 10 of the car underframe.

Member 6 comprises an irregularly shaped member having a curved portion 11 and a straight or flat portion 12. As illustrated, this member is in the form of an irregular rack and is provided with teeth 13 formed on or secured to the curved portion

and with teeth 14 formed on or secured to the straight portion 12. This depending-member is adapted for engagement with and designed to coöperate with the rotatable shaft 7, or with suitable engaging means mounted on the shaft, as for example, a gear-wheel 15. The curved portion of the member 6 is preferably concentric with the door-hinge 5, as shown in the forms of Figs. 2 and 5, but it may be of the curvature shown in Fig. 6, that is, with a curved portion not concentric with the door-hinge. The flat portion of the depending member may be substantially parallel with respect to the under face of the door or slightly inclined thereto.

When the door is in its closed position, as shown in full lines in Fig. 2, the shaft 7 is directly under the lower portion 12 of member 6 with the gear-wheels 14 engaging the teeth of said portion, thus forming supporting means for maintaining the door in closed position. To open the door, shaft 7 is rotated by means of a suitable operating lever 16, or other suitable means. Owing to the rotation of shaft 7 together with its gear, it is apparent that the shaft will move or roll laterally in its fixed bearings during the travel of gear-wheel 15 along the horizontal portion of the rack. When the end of the horizontal portion is reached the door and its depending-member will begin to descend and will, while gear 15 is meshing with the curved portion of the rack, drop into the position shown in dotted lines, Fig. 2.

To raise the door to a closed and locked position, the rotation of the shaft is reversed and said door is raised by means of the rotating gear meshing with the curved position of the rack. For the purpose of maintaining the gear in mesh with the rack, particularly during the period of change of travel from the curved portion to the straight portion, I provide means on shaft 7, as a cam 17 operable in connection with a guide 18 to bodily move the shaft laterally in its bearings. After the door is moved to a closed position a continued rotation of the shaft moves it under and along the flat portion of the rack. In the operation of opening or closing the door or doors the bodily movable shaft 7 moves horizontally in a plane parallel or substantially parallel with the floor of the car. To prevent the end discharge doors 2 from opening as wide as the

doors 4, I provide hangers 19 arranged to engage said doors at the elevation desired, and, in addition thereto, I provide a clutch mechanism 20 acting in conjunction with gear-wheels 21, which latter differ slightly from the gear-wheels 15. This clutch mechanism 20 operates to prevent the turning of gear-wheel 21 after the doors 2 engage the hangers 19, at the same time though shaft 7 is permitted to rotate to further lower the doors 4; in other words, the clutch device is designed to allow a certain amount of lost motion between the shaft and wheel 21.

The shaft operating mechanism, as shown, in addition to the operating lever 16, comprises a ratchet-wheel 22 mounted upon shaft 7, a pivoted multiple pawl 23 and a pivoted pawl engaging member 24. This mechanism is operable to prevent reverse movement of the shaft 7 when actuated and to lock the shaft against rotation in order to maintain the discharge doors in the desired inclined position during the operation of dumping. The depending-members 6 are preferably provided with bearing flanges 25 designed to bear upon flanges 26 of the gear-wheels.

The construction illustrated and described is one that is free of complicated parts and the moving parts of the door operating and supporting mechanism are of such a nature that they will not become clogged in use.

What I claim is:

1. A car comprising a hinged door, a rotatable and bodily movable shaft mounted to move in fixed bearings, a depending member carried by the door having teeth concentric with the door-hinge, and a gear on the shaft meshing with the teeth.

2. A car comprising a hinged door, a rotatable and bodily movable shaft mounted to move in fixed bearings, a depending member on the door having teeth concentric with the door-hinge and teeth parallel with the door, and a gear on the shaft meshing with the teeth.

3. A car comprising a hinged door provided with a depending member movable therewith, said member having an edge concentric with the door-hinge, and a rotatable and bodily movable shaft having means co-acting with the depending member for closing the door.

4. A car comprising a hinged door provided with a depending member movable therewith, said member having a curved portion concentric with the door-hinge, and a straight portion, and a rotatable shaft provided with means engaging the curved portion for closing the door and co-acting with the straight portion for supporting the door in closed position.

5. A car comprising a hinged door pro-

vided with a depending member movable therewith, said member having a curved portion concentric with the door-hinge and a straight portion, a rotatable and bodily movable shaft provided with means for engaging the curved and straight portions of the depending member, means for rotating the shaft and cam means operable to shift the shaft.

6. In a dump-car, a discharge-door having a depending rack movable therewith, a rotatable and bodily movable shaft, a gear mounted on the shaft and directly engaging the rack, said shaft movable in a plane substantially parallel with the floor of the car and means for rotating the shaft.

7. In a dump-car, a discharge door having a depending member movable therewith, a bodily movable, rotatable and vertically fixed shaft, means on the shaft coacting with the depending member for closing the door, and means for rotating the shaft.

8. In a dump-car, two discharge-doors each having a depending member movable therewith, a rotatable shaft, means on the shaft co-acting with the respective depending members to open and close the doors, and means operable to prevent one door from opening as wide as the other door comprising a stop and means on the shaft operable in connection with the first mentioned door.

9. In a dump-car, two discharge-doors each having a depending member movable therewith, a rotatable shaft, means on the shaft co-acting with the respective depending members to open and close the doors, and clutch mechanism mounted on the shaft and operable in connection with one of the doors.

10. A car comprising a dumping door having a depending member movable therewith, said member having a curved portion and a flat portion, a rotatable and horizontally movable shaft provided with means for engaging the curved and flat portions of the depending member, means for rotating the shaft and means for maintaining the shaft and depending member in engagement.

11. In a dump-car, a hinged door provided with a depending member movable therewith, said member having an engaging portion concentric with the door-hinge and an engaging portion substantially parallel with the under surface of the door, a rotatable and bodily movable shaft, means on the shaft coacting with the engaging portions of the depending member for closing the door, and means for rotating the shaft.

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

CHARLES J. REHLIN.

Witnesses:

CHAS. A. FISHER,
W. G. DOOLITTLE.