H. R. KEITHLEY.

DUMP CAR.

APPLICATION FILED APR. 23, 1917.

1,248,666.

Patented Dec. 4, 1917.

4 SHEETS—SHEET 1.

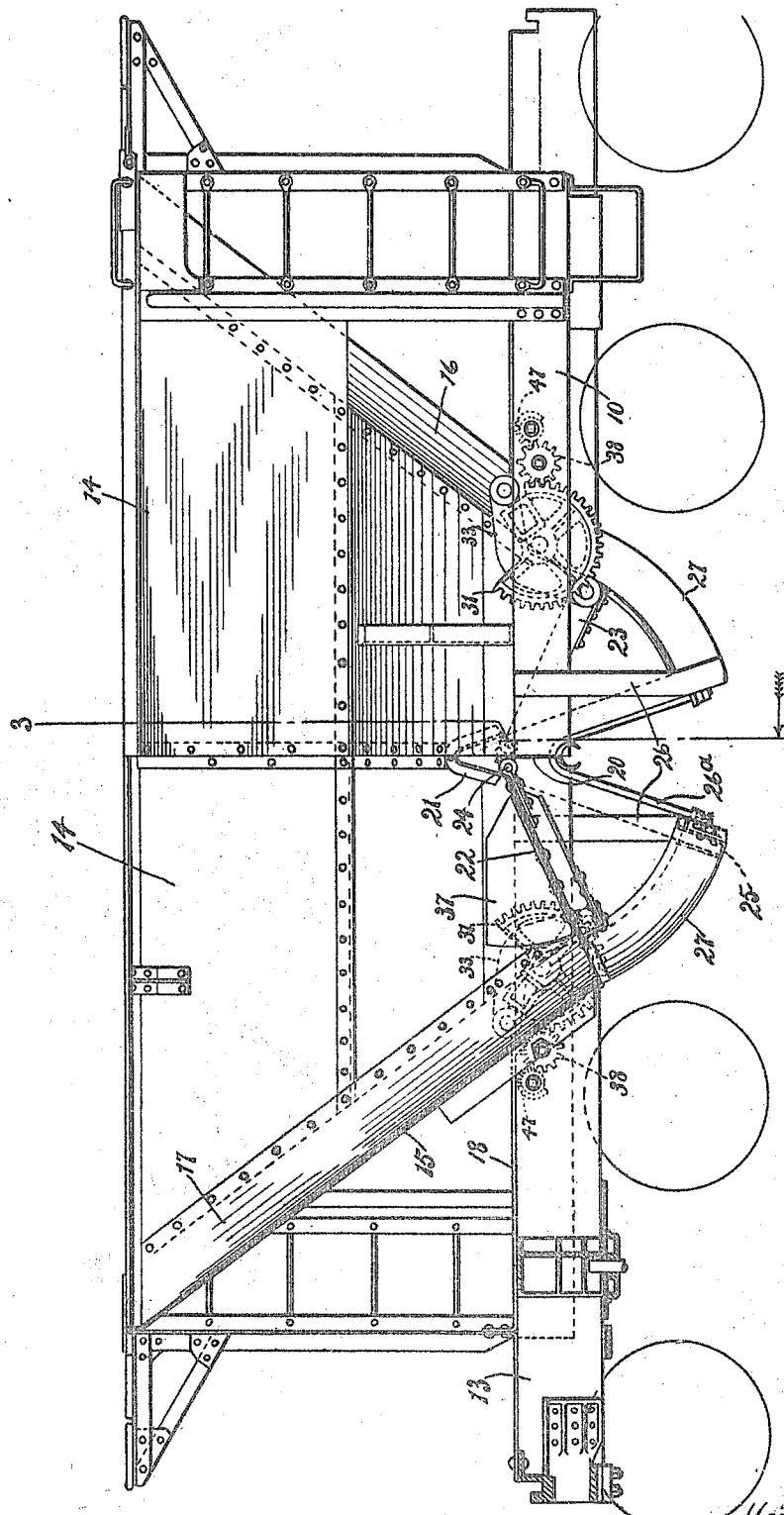


Fig. 1.

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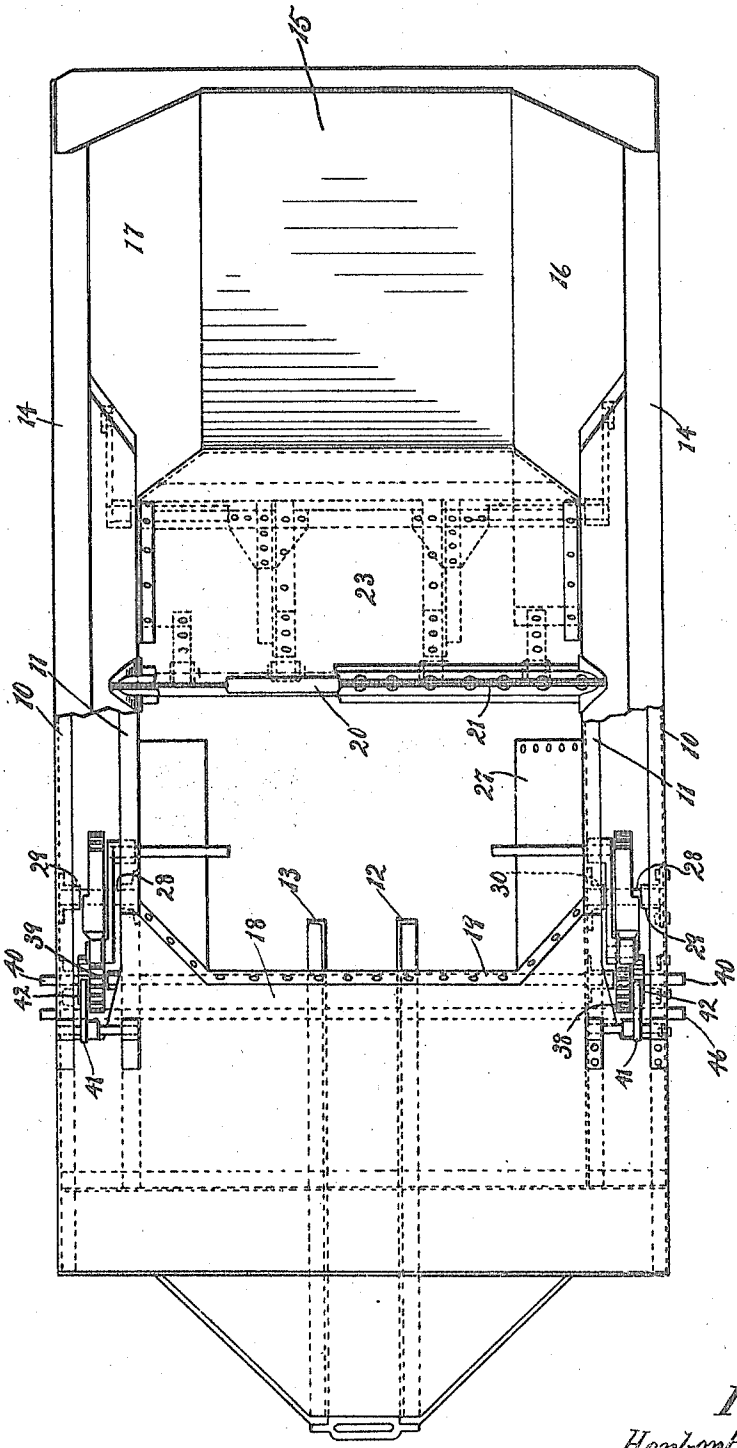


Fig. 2.

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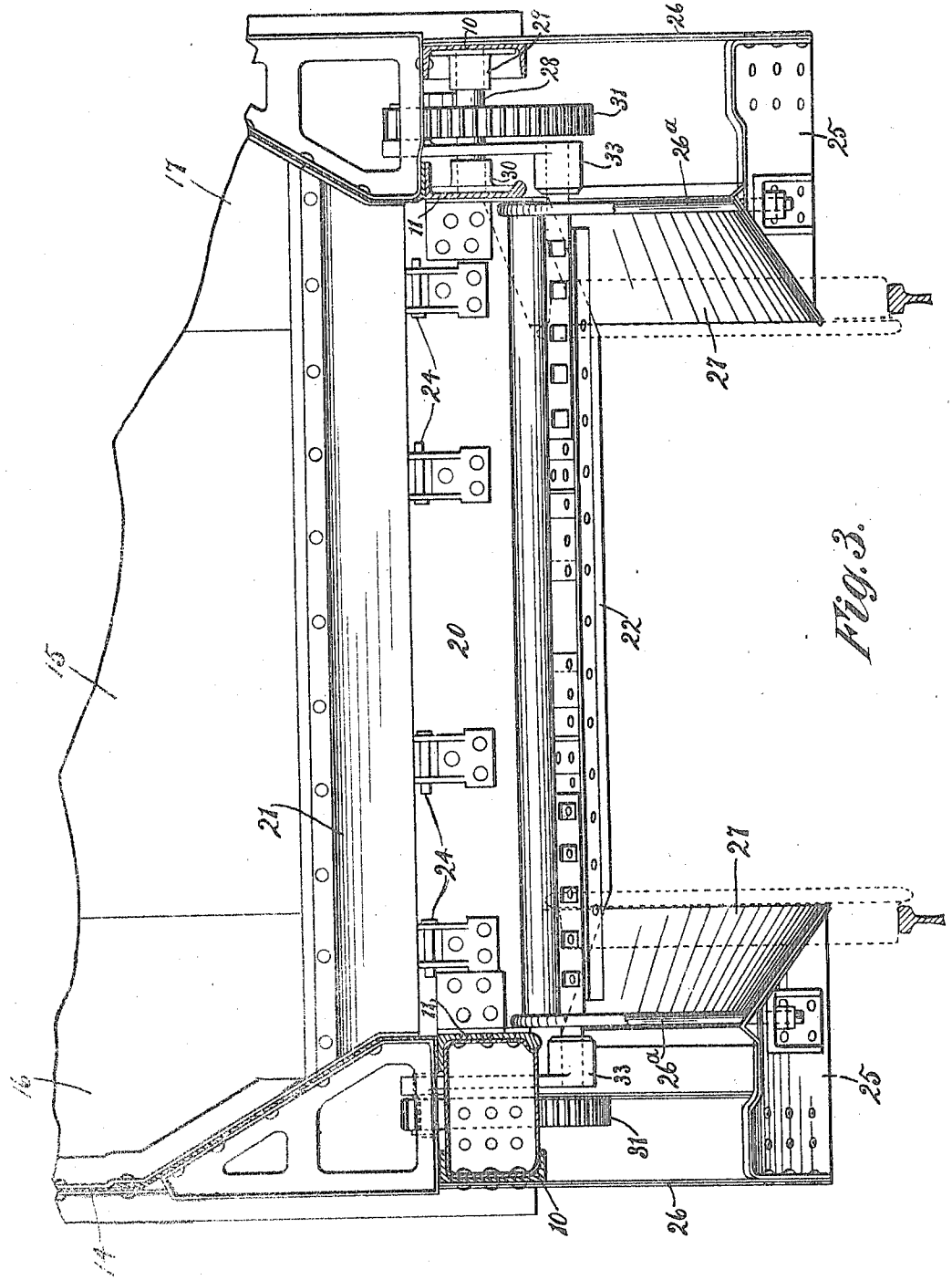


Fig. 3.

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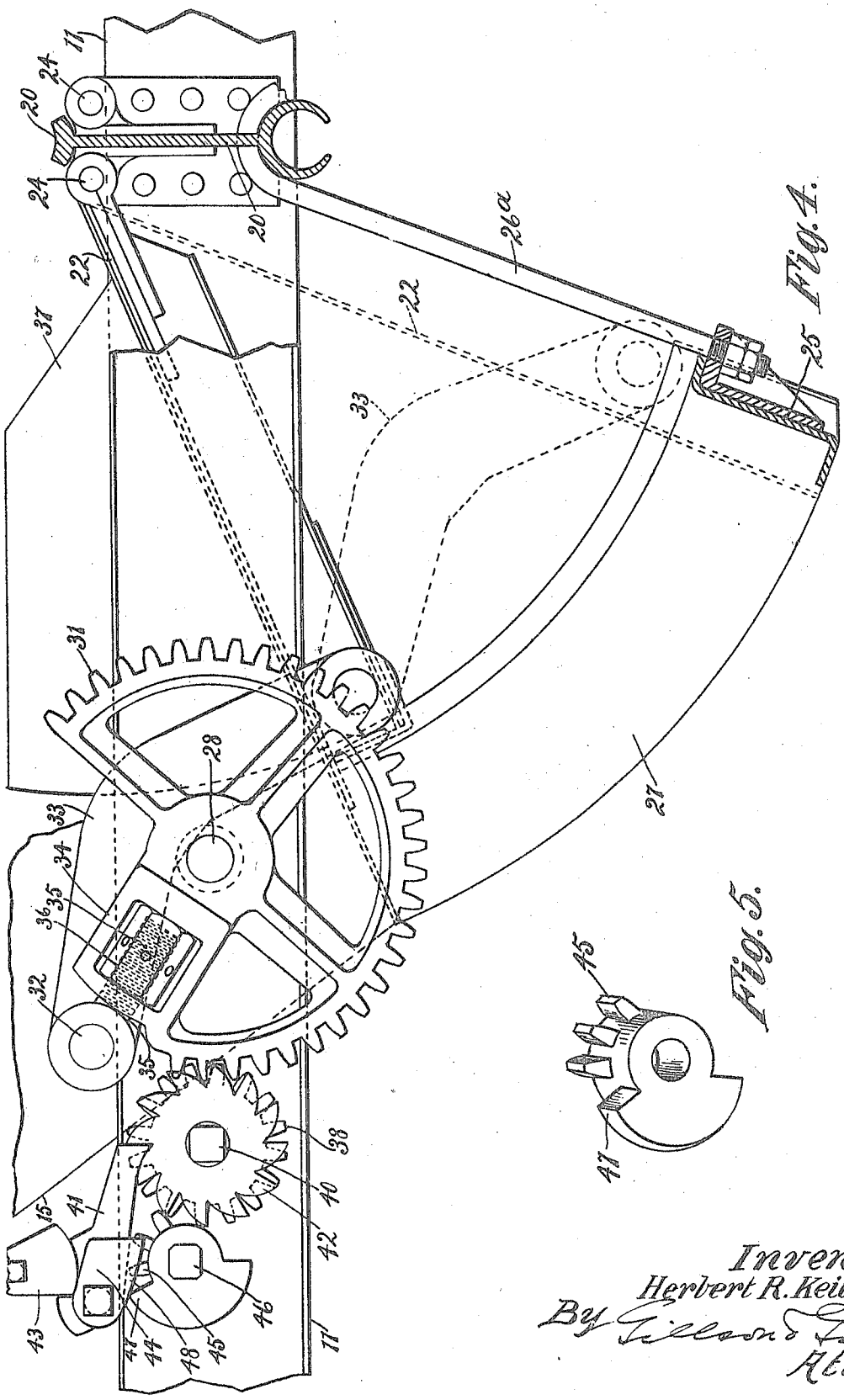


Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

HERBERT R. KEITHLEY, OF MICHIGAN CITY, INDIANA.

DUMP-CAR.

1,248,666. Specification of Letters Patent. Patented Dec. 4, 1917.

Application filed April 23, 1917. Serial No. 163,956.

To all whom it may concern:

Be it known that I, HERBERT R. KEITHLEY, a citizen of the United States, and resident of Michigan City, county of Laporte, and State of Indiana, have invented certain new and useful Improvements in Dump-Cars, of which the following is a specification, and which are illustrated in the accompanying drawings, forming a part thereof.

The invention relates to dump cars of the hopper type, in which the doors for retaining the lading are arranged transversely of the car and are hinged to a beam centrally crossing the hopper opening. This type of car is more commonly used for carrying ore, and the lading is discharged between the rails of the track on which the car runs.

The objects of the invention are to generally improve on cars of this type, and more specifically to provide means for deflecting the material inwardly as it falls and to provide improved means for operating and locking the doors.

A practical embodiment of the invention is hereinafter described, and is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the car, partly in section;

Fig. 2 is a plan view of the car, some portions being removed;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a detail of the car showing the mounting of the doors and the controlling mechanism therefor; and

Fig. 5 is a view in perspective of a gear of the device.

The car frame comprises a pair of side sills 10, 11, at each side, and a pair of short center sills 12, 13, at each end of the car and terminating at the hopper, these various sills being, of course, suitably connected by means of end sills and such transverse beams as may be essential to strength.

The hopper comprises suitable side plates or walls, as 14, and transverse slope sheets, as 15, riveted together and suitably supported by upper framework. Preferably the slope sheets 15 have their side portions 16, 17, upwardly inclined to facilitate free discharge of the lading. An end or floor plate, as 18, covers each pair of center sills and the end portions of the side sills, and extends from the end of the car frame to the slope sheet 15 of the hopper, to which it is securely riveted, its inner edge being flanged downwardly, as indicated at 19.

A beam 20 extends centrally across the hopper opening, and is secured to the inner side sills 11, this beam being preferably covered by a shield 21, which, as shown, is substantially V-shape in cross-section.

The doors 22, 23, are hinged to the beam, as shown at 24. These doors close against the lower margins of the slope sheets 15. Inwardly inclined deflecting plates, as 27, are secured to and form extensions of the slope sheets 15, extending downwardly to and being secured to a pair of short transverse bars 25, supported by a pair of hangers, as 26, pendent from the side of the car, and a rod 26^a hooked over the beam.

The doors 22, 23, are independently controlled, and as the controlling mechanism is the same for both one set only need be described. Furthermore, the operating mechanism is duplicated at each side of the car, the two sets associated with each door being, however, united and controlled by certain cross-shafts, as hereinafter described.

Between the side sills 10, 11, and located back of the plane of the slope sheet, a short shaft 28 is journaled in suitable boxes 29, 30, attached to the adjacent faces of the sills. Upon this shaft 28 is fixed a spur gear 31, which may be segmental. This wheel is provided with a crank arm carrying a wrist pin 32, which is connected by means of a rigid bent link 33 with the adjacent door, being attached thereto near its swinging edge. When the door is closed, as in the solid lines position of Fig. 4, the wrist pin 32 has been carried slightly beyond a line passing through the centers of the shaft 28 and the pivot on the door to which the link 33 is connected, the elbow of the link resting upon the hub of the wheel, or upon the shaft 28 as shown.

In order to insure the tight closing of the door the connection with the actuating wheel 31 is made adjustable. This is accomplished by means of an extensible crank arm. The wheel is provided with a box-shaped cage 34, through which extends a threaded bolt 35, the outer end of which is in the form of an eye and holds the wrist pin 32. Within the cage 34 is housed an adjusting nut 36, mounted upon the bolt 35. By suitable manipulation of this nut the bolt may be extended or retracted to provide a proper adjustment.

The two gear wheels 31 coöperating with each door are actuated by means of pinions 38, 39, fixed upon a shaft 40 journaled in the several side sills of the car frame and extending at each end beyond the outer sill, the projecting ends of the shaft being squared for engagement by an operating wrench or removable crank handle, not shown. A retaining pawl 41, pivotally attached to the side sills, coöperates with a ratchet wheel 42 in fixed relation with each of the pinions 38, 39. A locking dog 43, pivoted to one of the side sills, may be thrown into engagement with a shoulder 44 formed on the pawl 41, effectually preventing the disengagement of this pawl from its associated ratchet wheel.

By turning the shaft 40 to the right (Fig. 4) by means of a suitable wrench or crank, the door is closed and the wrist pin 32 carried a little past the center in order that the weight of the lading may be borne by the shafts 28. The pawl 41 prevents accidental opening, and the dog 43 securely locks the pawl against being thrown back by jarring.

To open the doors it is necessary to manually turn the wheel 31 to throw the wrist pin 32 past the center, whereupon the weight of the lading will become effective. In order to prevent injury to the operator in this releasing action, a pair of segmental pinions 45 are fixed upon a second cross shaft 46 and engage the teeth of the pinion 38. The shaft 46 extends beyond the outer side sills and has its ends squared for engagement by a wrench or hand crank. The pinions 45 are provided with just enough teeth to carry the crank pin past center and disengage from the pinions 38 as the weight of the lading becomes effective to open the doors.

The pawl 41 is automatically raised by a cam 47 formed on and offset from the teeth of the pinion 45 and coöperating with a shoulder 48 on the pawl. The doors are provided with side wings or plates 37, which prevent the escape of the discharging material laterally.

I claim as my invention—

1. In a dump car, in combination, a truck, a suitable underframe mounted on the truck, a hopper mounted on the frame, the discharge opening of the hopper extending outside of the planes of the truck wheels, doors for the hopper opening hinged transversely of the car, and inwardly inclined deflecting plates at each side of and below the hopper opening, the plates terminating within the planes of the truck wheels.

2. In a dump car, in combination, a suitable underframe, a hopper mounted on the frame, a beam located on the median line of the hopper opening and arranged transversely of the car, doors hinged to the beam for closing the hopper opening, and inwardly inclined deflecting plates extending downwardly from the sides of the hopper opening.

3. In a dump car, in combination, a suitable frame comprising side sills, a hopper mounted on the frame, a pair of drop doors for the hopper opening hinged transversely of the car, a shaft carried by a side sill, a gear crank wheel mounted on the shaft, a link connecting the crank of the wheel with one of the doors, an actuating shaft, and a pinion on the actuating shaft and meshing with the crank wheel.

4. In a dump car, in combination, a suitable frame comprising side sills each consisting of two members, a hopper mounted on the frame, a pair of drop doors for the hopper opening hinged transversely of the car, a shaft journaled between the members of each pair of side sills, a gear crank wheel mounted on each shaft, a link connecting the crank of each wheel with one of the doors, an actuating shaft, and a pinion on such shaft meshing with the crank wheel.

5. In a dump car, in combination, a suitable frame comprising side sills, a hopper mounted on the frame, a pair of drop doors for the hopper opening hinged transversely of the car, a pair of alined shafts journaled, respectively, between members of each side sill, a gear crank wheel on each shaft, a link connecting the crank of each wheel with one of the doors, an actuating shaft extending across the car and having its ends projecting beyond the sides thereof, and a pair of pinions fixed on the last-named shaft and meshing one with each of the crank wheels.

6. In a dump car, in combination, a suitable frame comprising a pair of spaced side sills, a hopper mounted on the frame, a pair of drop doors for the hopper opening hinged transversely of the car, a short shaft journaled between the members of the side sills, a gear crank wheel mounted on the shaft, a link connecting the crank of the wheel with one of the doors, a second shaft having a projecting polygonal end, a pinion on such shaft and meshing with the crank wheel, and releasing means comprising an actuating shaft and a segmental pinion fixed on the shaft and engaging the first-named pinion.

7. In a dump car, in combination, a suitable frame comprising a pair of side sills, a hopper mounted on the frame, a pair of drop doors for the hopper opening hinged transversely of the car, short alined shafts journaled, respectively, between members of each side sill, a gear crank wheel on each shaft, a link connecting the crank of each wheel with one of the doors, an actuating shaft extending across the car and having its ends projecting beyond the sides thereof, a pair of pinions fixed on the last-named shaft and meshing each with one of the crank wheels, and releasing mechanism com-

prising a shaft and a pair of segmental pinions engaging the pinions on the actuating transverse shaft.

8. In a dump car, in combination, a frame comprising two pairs of spaced side sills, a hopper mounted on the frame, a beam transverse of the frame and located on the median line of the hopper opening, a pair of drop doors hinged to the beam, a pair of alined shafts mounted between each pair of side sills at each side of the hopper opening, a gear crank wheel mounted on each of said shafts, a link connecting the crank wheels of each pair with one of the doors, such links being attached to the side margins of the door, an actuating shaft journaled across the car back of each pair of crank wheels, and a pair of pinions on each of the last-named shafts each meshing with one of the crank wheels.

9. In a dump car, in combination, a frame comprising two pairs of spaced side sills, a hopper mounted on the frame, a beam transverse of the frame and located on the median line of the hopper opening, a pair of drop doors hinged to the beam, a pair of alined shafts mounted, respectively, between each pair of side sills at each side of the hopper opening, a gear crank wheel mounted on each of said shafts, links connecting each crank wheel with one of the doors and being attached to the side margins of the door, an actuating shaft journaled across the car back of each pair of crank wheels, a pair of pinions on each of the last-named shafts each meshing with one of the crank wheels, and releasing means for each door comprising a shaft journaled transversely of the car and a pair of segmental pinions fixed on each of the last-named shafts and each meshing with one of the pinions.

10. In a dump car having a hopper, in combination, a door for closing the hopper opening, an actuating crank shaft, a link connecting the door with the crank of the shaft and arranged to pass beyond the center of load draft when the door is closed, a pinion for turning the shaft, and opening means comprising a segmental pinion meshing with the first-named pinion and arranged to disengage from the pinion as the weight of the lading becomes effective to open the door.

11. In a dump car having a hopper, in combination, a door for closing the hopper opening, an actuating crank shaft, a link connecting the door with the crank of the shaft and arranged to pass beyond the center of load draft when the door is closed, a pinion for turning the shaft, opening means comprising a segmental pinion meshing with the first-named pinion and arranged to disengage from the pinion as the weight of the lading becomes effective to open the door, ratchet and pawl mechanism for holding the first-named pinion against movement in the opening direction, and a pawl lifter associated with the segmental gear.

HERBERT R. KEITHLEY.

Witnesses:
E. U. TEST,
J. WENTLAND.