



C. H. CLARK.

DUMP CAR.

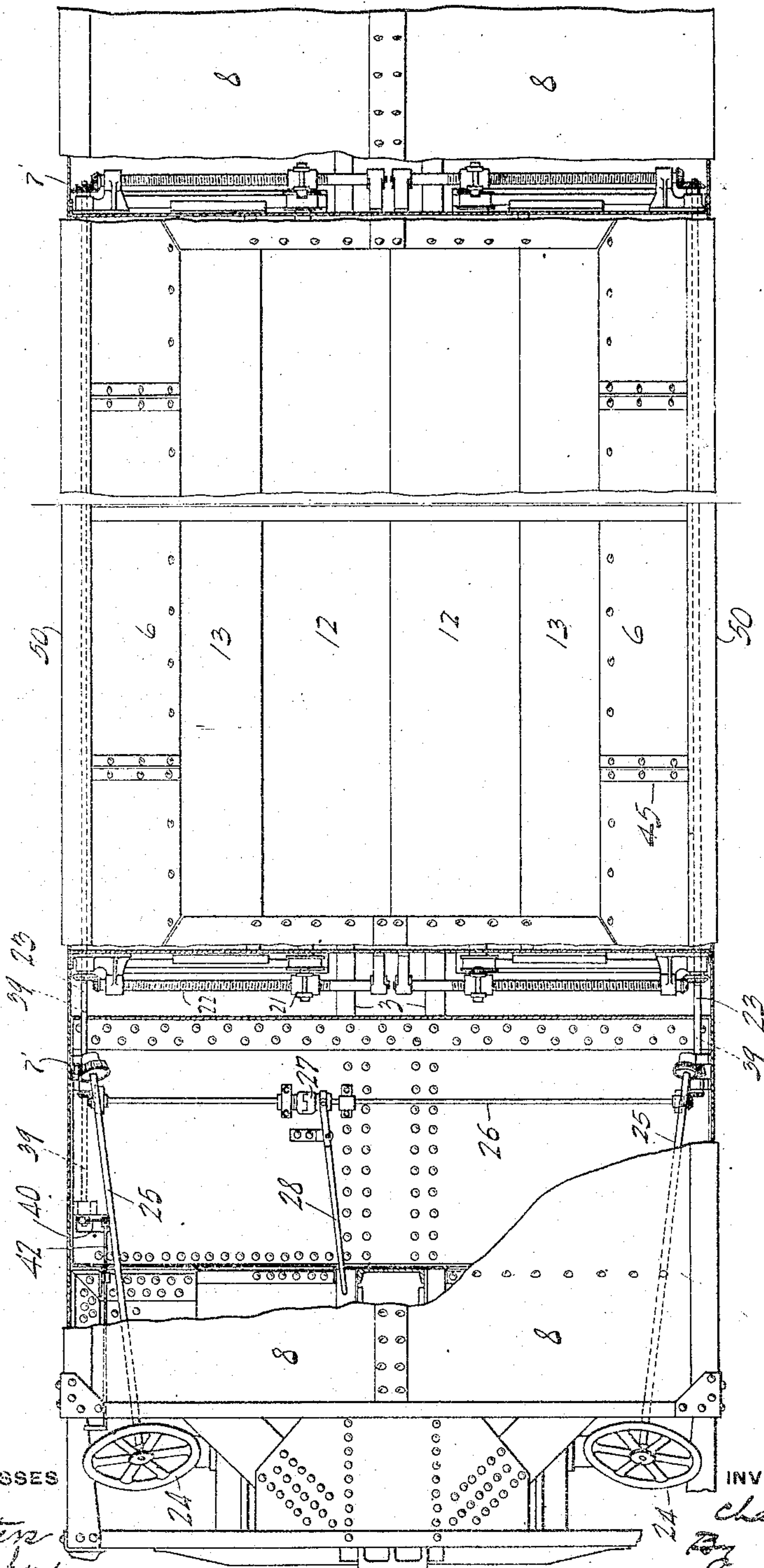
APPLICATION FILED FEB. 10, 1909.

Patented Nov. 2, 1909.

6 SHEETS—SHEET 2.

938,976.

Fig. 2.



WITNESSES

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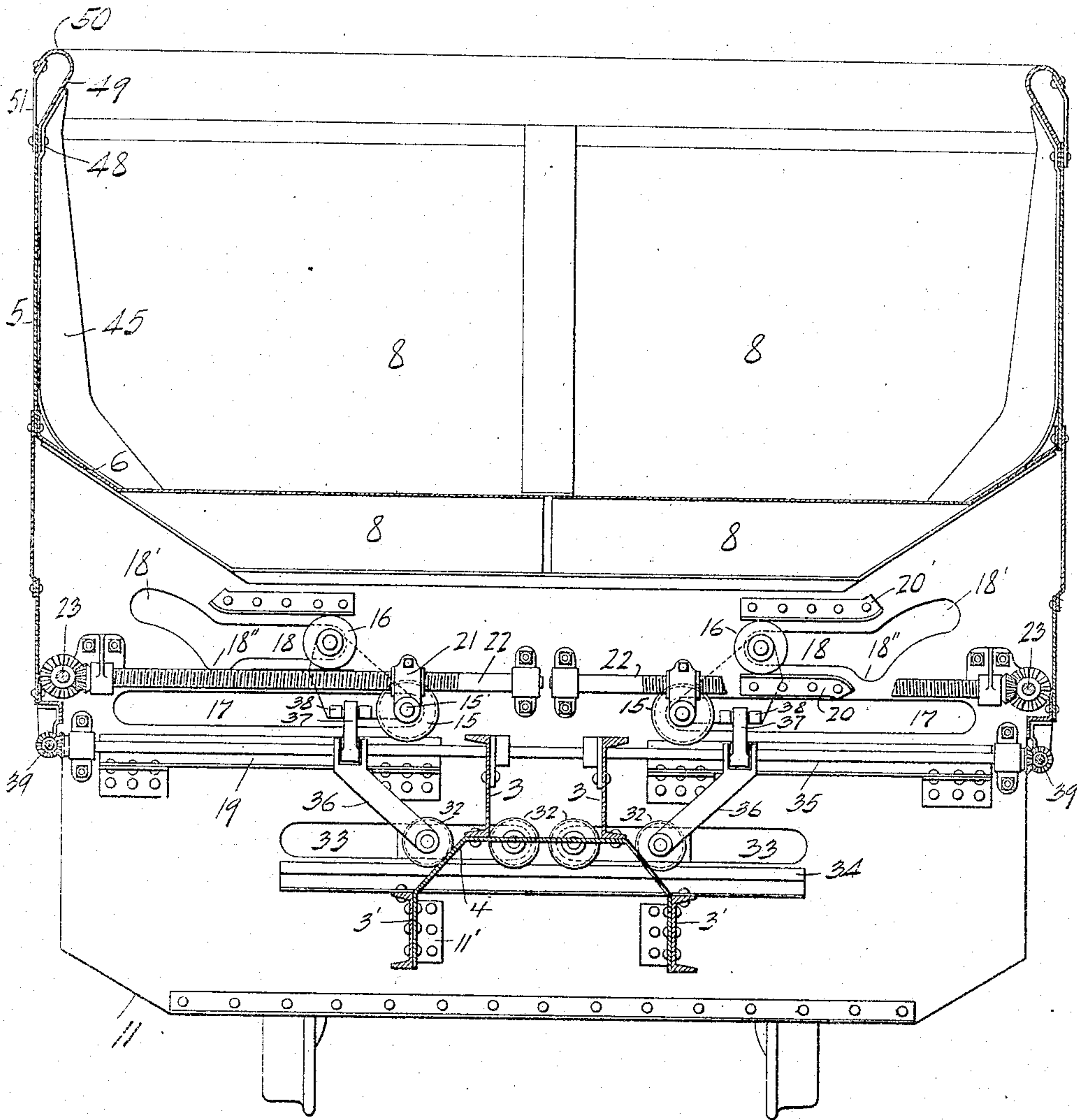
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6 SHEETS—SHEET 3.

*Fig. 3.*



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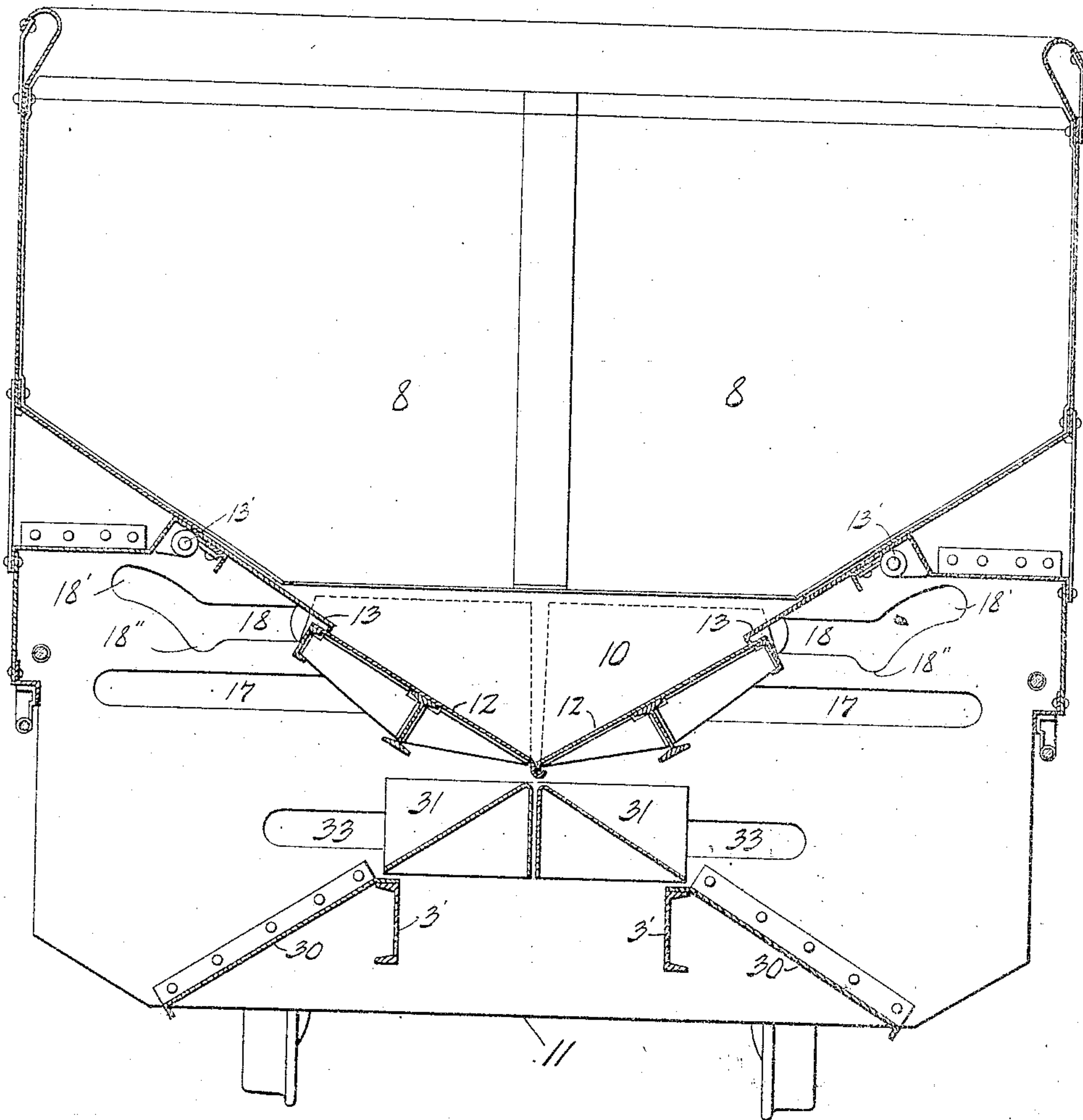


DUMP CAR.

Patented Nov. 2, 1909.

6 SHEETS—SHEET 4.

*Fig. 4.*



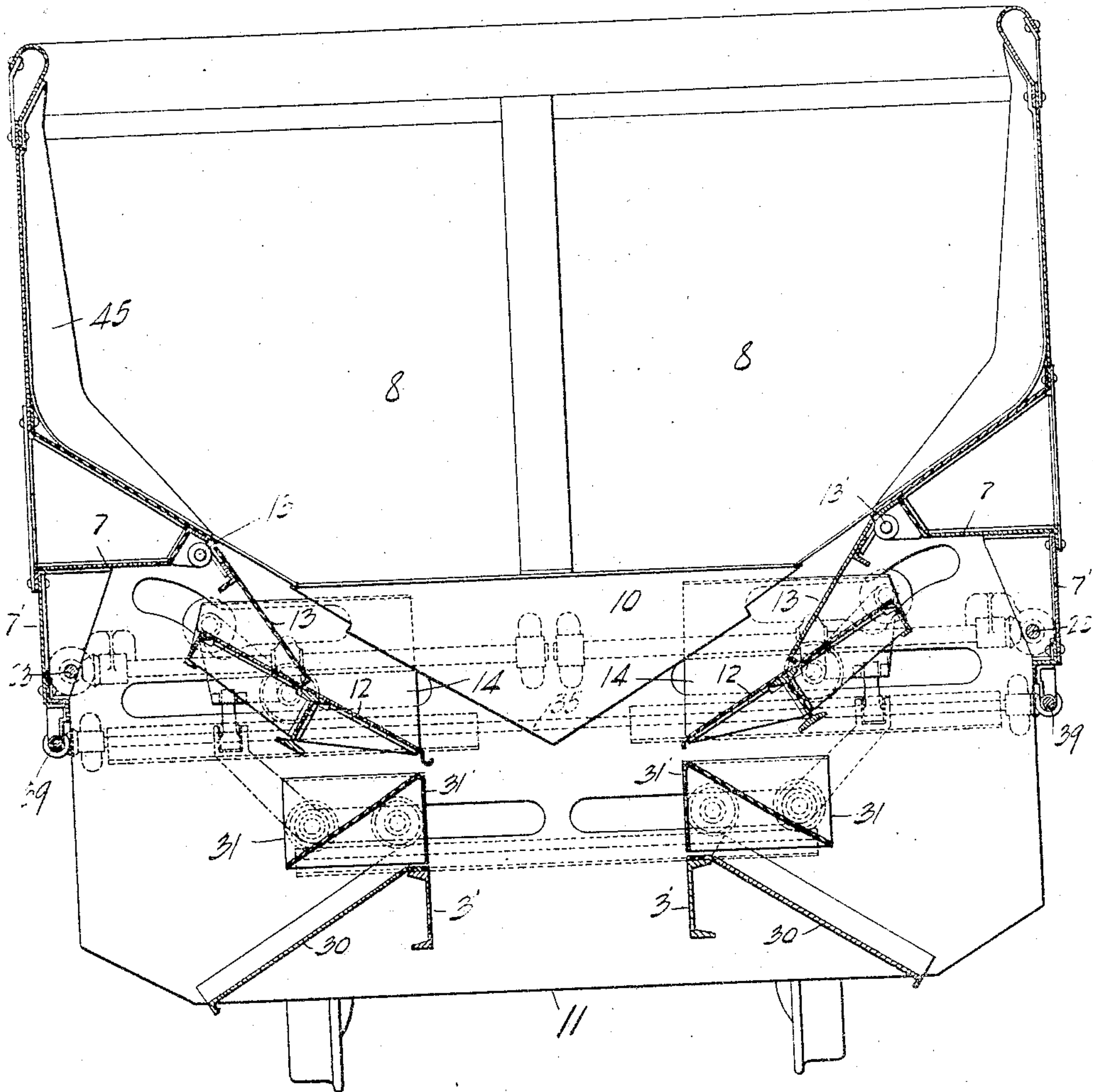
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6 SHEETS—SHEET 5.

*Fig. 5.*



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DUMP CAR.

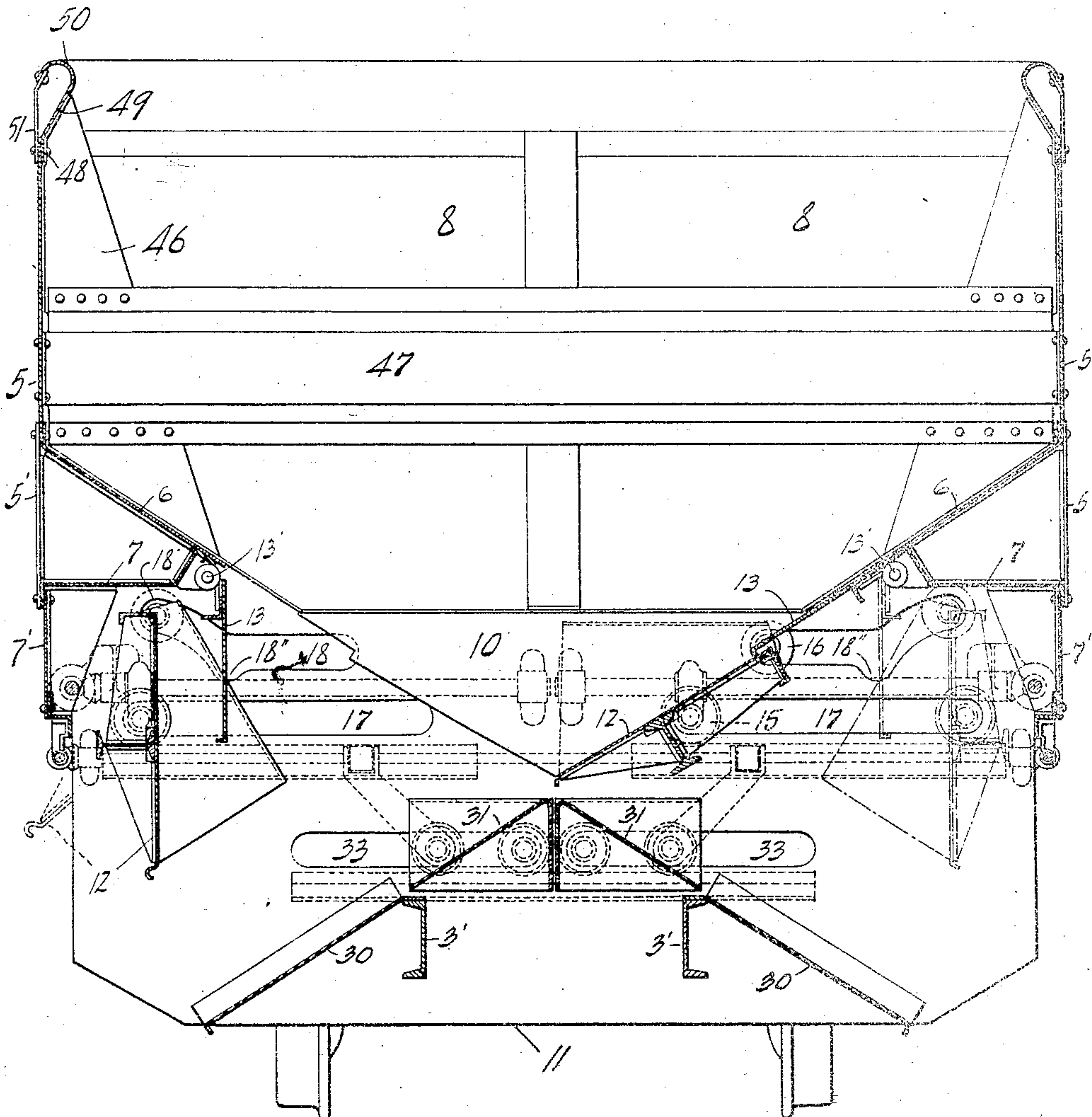
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6 SHEETS—SHEET 6.

Fig. 6.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## DUMP-CAR.

938,976.

Specification of Letters Patent.

Patented Nov. 2, 1909.

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*To all whom it may concern:*

Be it known that I, CHARLES H. CLARK, a resident of Crafton, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Dump-Cars, of which the following is a specification.

One object of this invention is to provide an improved arrangement of laterally movable doors disposed longitudinally of the hopper, with the main or primary doors of less width than the bottom opening and supplemented by auxiliary doors for fully closing the same. A bottom opening of large area is thus controlled by doors of high efficiency which are manipulated in comparatively small space.

A further characteristic is the chute mechanism of novel design which coöperates with the laterally movable doors for dumping the load at one or both sides of the car or at the center, as may be desired.

Another and very important feature is the adaptation of a center-sill underframe to a car adapted for center as well as side dumping, thereby providing for more direct and economic transmission of the draft forces than heretofore.

The invention includes door and chute operating mechanisms of novel design; a hopper embodying several structurally novel features; a top chord of improved construction, and other features of novelty referred to hereinafter.

In the accompanying drawings, Figure 1 is a view partly in side and partly in sectional elevation of a portion of a dump car embodying the invention, and Fig. 2 is a top and sectional plan of the same. Figs. 3 to 6 are cross sections taken on lines 3—3, 4—4, 5—5 and 6—6, respectively, of Fig. 1.

Referring to the drawings, 2 are the draft beams and 3 the end portions of the center sills here shown as inward continuations of the draft beams. Portions 3' of the center sills coincident with the mouth of the hopper are offset downwardly and laterally from end portions 3, being connected thereto by the yoke-shaped part or hanger 4, Figs. 1 and 3. Provision is thus had for transmitting the draft forces from one end of the car to the other without obstructing the hopper, and without interfering with the door mechanism. Furthermore, the center sills thus arranged permit of either center

or side dumping, alternative operations not heretofore attained with continuous center sills.

5 are the sheets forming the side walls of the hopper with their lower portions disposed inwardly and downwardly, forming the sloping floor extensions or ledges 6 which are braced or supported from beneath by the angular longitudinal plate or girder members 7. The latter are provided with side extensions 7' connected by straps 5' with side sheets 5. Ledges 6 define the width of the hopper bottom opening.

8 are the sloping end floor plates which pass upwardly over bolster 9, and hanging from the inner ends of these floor plates is the V-shaped plate 10. The doors close around these plates, the latter forming the end walls of that portion of the hopper bottom of which the doors when closed form the sides and bottom.

Back of or outwardly from each of plates 10 is the vertical transverse plate or sheet 11, to which end plates 8 are secured. The plate embraces and extends beneath sills 3' to which it is secured, as indicated at 11'. Plates 11 form the end walls of the space through which the material flows from the car and also serve as fenders for preventing it from overflowing the trucks. In addition, these plates support various parts of the dumping mechanism, and slots or openings therein serve to guide some of the movable parts, all as will presently appear.

The door feature is embodied in a pair of lower or main doors 12 and a pair of supplemental doors 13. Doors 12 are movable laterally bodily and are so inclined as to converge and close together at the center of the car. The doors extend from end to end of the bottom opening, and each is provided with the vertical end members 14 which move in and out behind the depending V-shaped plates 10 as the doors close and open, preventing the material from flowing over the door extremities. When closed together the transverse area of doors 12 is less than the width of the hopper bottom opening, and doors 13 are provided for closing the remainder of said opening.

Doors 12 are spaced downwardly from the fixed floor ledges 6 so that the supplemental doors 13, hinged at 13' to the lower edges of the ledges, slope downwardly and inwardly toward and at their free edges rest on the



main doors. One result of this arrangement is that as the main doors move laterally or outwardly from closed position the inclination of the doors 13 increases, thus accelerating the downward flow of the load. When the main doors are opened only partially for a center dumping operation, as in Fig. 5, both sets of doors remain in inclined position, the inclination of doors 12 being the same as when closed, and the inclination of doors 13 increased, as above indicated. When the doors are fully open for dumping at either one or both sides of the car, as in Fig. 6, the main doors 12 are moved outwardly clear of the supplemental doors so that the latter turn downward into vertical position, with means presently to be described for affording the main doors a similar movement, with the result that the full transverse area of the hopper bottom opening is available for discharging the load. It is characteristic of the invention that the several doors are parallel longitudinally of the car and that the parallelism is maintained throughout their various movements.

The means for supporting and actuating the main doors will now be described. Each end of each of these doors has trunnion connections with wheels 15 and 16 located at the outer side of transverse plate 11, the trunnions moving through slots 17 and 18 in the latter. Wheel 15 is preferably located a little above or back of the center of the door and wheel 16 at the upper or outer edge thereof. Hence, the inner or lower portion of each door extends inwardly and downwardly for a considerable portion of its width from wheel 15. Wheel 15 is supported on a track 19 secured to plate 11 beneath slot 17, and wheel 16 moves between guides 20 and 20' also secured to plate 11 below and above slot 18.

Mounted on trunnion 15' of wheel 15 is the internally threaded sleeve 21 through which extends the horizontal transverse screw shaft 22. One of these shafts is provided for each end of the door, the shafts at each end of the hopper alining, as shown in Fig. 3, and each at its outer end geared to a longitudinal shaft 23 which is geared to the corresponding shaft at the other end of the hopper. Each of shafts 23 may be operated by a hand wheel 24 having its shaft 25 geared to one end thereof, as in Fig. 2. Thus doors 12 and 13 at either side of the center of the car may be operated without disturbing the other doors.

Provision is made for operating all the doors simultaneously, the same consisting of a two-part transverse shaft 26 geared to the extremities of shafts 23, with the parts of shaft 26 connected when desired by clutch 27 provided with a suitable operating lever 28. When this clutch is thrown in, all of the doors may be operated simultaneously

by either of the hand wheels 24, while when the clutch is out the door operating mechanisms are disconnected and are quite separate and distinct from each other.

A chute of novel design is provided for dumping the load beneath the center of the car, or for deflecting the same to either or both sides of the track, and is embodied in fixed and movable chute members positioned beneath the doors. The fixed chute members 30 are inclined downwardly and outwardly from sills 3', the inclination thereof being preferably about the same as the doors when closed. Above fixed members 30 are the movable chute members 31 which are immediately beneath the lower edges of doors 12 when closed. Each of chute members 31 is supported at each end by two wheels 32 at the outer side of plate 11, the latter being slotted horizontally at 33 through which the wheel axles project, wheels 32 moving on track 34 supported by sills 3'.

For dumping the car at one side of the track, as in full lines in Fig. 6, or at both sides of the track as shown partly in dotted lines in the same figure, chute members 31 are in inward position and form upwardly converging continuations of the fixed member 30. So that when dumped at one side only, the material discharging over the then closed doors or floor members is deflected laterally over the active side of the chute and falls clear of the track. When all of the doors are fully open, as in full lines at the left-hand side of Fig. 6 and dotted lines at the right-hand side, the material discharges at both sides.

For a center dumping operation, doors 12 are opened only partially, and at the same time movable chute members 31 are moved apart, as in Fig. 5, the movement of the doors and chute members extending to the space or clearance between center sills 3', and these sills together with the vertical sides 31' of the chute members form a vertical passage or drop for the material.

The movable chute members are preferably actuated by the same mechanism that operate doors 12, with means for operatively connecting said parts when the chute members are to be moved, as in Fig. 3. The construction in this regard is here shown consisting of a shaft 35 at each end of the hopper beneath screw shaft 22, with an arm 36 projecting from the axle of one of chute wheels 32 and at its upper end forked and movable on shaft 35. Also movable on said shaft and embraced by the fork is arm 37 which turns with the shaft and is adapted to be turned thereby between lugs 38 projecting from the end 14 of door 12. A mechanism of the character described is provided for each end of each movable chute section, so that either or both of the latter may be moved simultaneously with doors



12, or may remain at rest when the doors are moved. Shafts 35 at opposite ends of the hopper are geared to longitudinal shafts 39, beneath and parallel with shafts 23, with one of shafts 39 provided with crank 40, connected by link 41 with an operating lever 42.

The outer portion 18' of each of slots 18 is curved upwardly so that after doors 12 open wider than is required for the center dumping operation, the outer edge of each door moves upward, thereby permitting the door to oscillate on trunnion 15' until it finally assumes a vertical position back or outside of the then vertically hanging supplemental door 13, as in full lines at the left-hand side of Fig. 6. The radius of the curved slot extension 18' is struck from the center of trunnion 15' when the door is vertical, so that the latter is free to oscillate and its lower edge may swing outwardly, as in dotted lines at the left-hand of Fig. 6, to give clearance for boulders or lumps of material striking the door as they discharge from the car, and depression 18'' at the base of curved portion 18 affords an extreme movement of this sort.

The hopper sides and floor ledges may be reinforced by stays 45 and 46, the latter being preferably somewhat wider and arranged at the center of the hopper to receive the transverse tie or reinforcement 47, connecting the opposite side sheets 5.

The top chord for each of the hopper sides consists preferably of a strip or plate of heavier gage than sheets 5 and riveted to the inside of the top edge of the latter at 48, the cord being inclined inwardly and upwardly as indicated at 49, with its top portion curved outwardly and downwardly at 50 in substantially semi-circular form, and with the downwardly curved edge secured at intervals to the outer face of the top edge of side sheets by straps 51. This form of chord provides a substantial reinforcement, and there is no danger of shovels, buckets, or other loading apparatus catching the same when moving away from the car.

I claim:—

1. In a dump car, a pair of laterally parting doors narrower than the bottom opening of the car, and a pair of supplemental doors hinged above and bearing downwardly on the first mentioned doors.

2. In a dump car, a door movable bodily laterally, and a supplemental door hinged above and bearing downwardly upon the first mentioned door.

3. In a dump car, outwardly parting doors closing together between the sides of the car and when closed having less transverse area than the width of the bottom opening, and inwardly extending supplemental doors supported at opposite sides of the opening and coacting with the first mentioned doors.

4. The combination of a car hopper, straight side sills and downwardly offset center sills, and door mechanism operative between the side sills and above the center sills.

5. In a dump car, doors narrower than the car bottom opening and movable laterally bodily toward and from the center of the car, and supplemental doors.

6. In a dump car, doors narrower than the car bottom opening and movable laterally bodily to and from the center of the car, and vertically swinging supplemental doors.

7. In a dump car, doors narrower than the car bottom opening and movable laterally bodily toward and from the center of the car, and vertically swinging supplemental doors above and parallel with the first mentioned doors.

8. In a dump car, oppositely inclined doors movable laterally bodily, and hinged supplemental doors sloping downwardly and inwardly and bearing on the first mentioned doors.

9. In a dump car, two sets of doors for the open bottom thereof—one set arranged above the other with the lower set closing the central portion of the opening and the upper set closing the outer portions of the opening, the upper doors hinged to bear downwardly on the lower doors, and means for moving the lower doors laterally beyond the upper doors whereby the latter may swing downward.

10. In a dump car, a pair of laterally movable doors closing together at the center of the car and having less transverse area than the width of the car bottom opening, a pair of vertically swinging supplemental doors above the first mentioned doors, and means for moving the first mentioned doors laterally bodily with means for turning them to vertical position, whereby both sets of doors are disposed vertically when in open position.

11. In a dump car, two pairs of doors for the open bottom thereof—one pair arranged above the other, the lower doors closing the central portion of the opening and the upper doors closing the portions of the opening at opposite sides of the lower doors when the latter are closed, means for moving the lower doors laterally, and movable chute members beneath the doors whereby the load may be dumped at either side of the car or from the center thereof.

12. In a dump car, a normally inclined door movable bodily from closed position, means controlling the first portion of such movement, and means affording the door when open a swinging movement on a horizontal axis.

13. In a dump car, a pair of doors converging downwardly, means for moving the doors laterally toward and from each other, and a pair of downwardly diverging later-



ally sliding chute members beneath the doors and meeting in a line intersecting the meeting edges of the doors.

14. In a dump car, a normally inclined door movable bodily from closed position, means holding the door inclined during the first part of its opening movement, and means affording the door a swinging movement when opened farther.

15. In a dump car, a normally inclined door movable bodily from closed position, means holding the door inclined during the first portion of its opening movement, and means operative during the latter part of the opening movement to afford the door a swinging movement on a horizontal axis.

16. In a combined side and center dump car, downwardly converging doors closing at the center of the car, means for moving the doors laterally bodily, means holding the doors inclined during the portion of their opening movement sufficient for the center dumping operation, and means affording the doors swinging movement on a horizontal axis when opened farther for side dumping.

17. In a combined side and center dump car, downwardly converging doors closing at the center of the car, means for moving the doors laterally bodily, means holding the doors inclined during the portion of their opening movement sufficient for the center dumping operation, means increasing the inclination of the doors during the remainder of their opening movement, and means affording the doors swinging movement when fully open.

18. In a dump car, a hopper having an inwardly extending floor ledge, a normally inclined door lower than the ledge and movable bodily, and means for moving the door to vertical position beneath the ledge.

19. In a dump car, a hopper having an inwardly extending floor ledge, a normally inclined door lower than the ledge and movable bodily horizontally therebeneath, and means affording the door swinging movement beneath the ledge on a horizontal axis.

20. In a dump car, a pair of doors converging downwardly, means for moving the doors laterally toward and from each other, a pair of downwardly diverging laterally movable chute members beneath the doors and meeting in a line intersecting the meeting edges of the doors.

21. In a dump car, a pair of downwardly converging doors, a pair of oppositely movable downwardly diverging chute members beneath the doors and meeting beneath the meeting edges of the doors, and means for operating either door independently of the other door.

22. In a dump car, a pair of downwardly converging doors, a pair of downwardly diverging chute members beneath the doors

and meeting beneath the meeting edges of the doors, and means for moving the doors toward and from each other and simultaneously moving the chute members toward and from each other.

23. In a dump car, a pair of downwardly converging doors, mechanism for opening and closing the doors, a pair of laterally moving downwardly diverging chute members beneath the doors and meeting beneath the meeting edges of the doors, and means for connecting the chute members with the door-operating means for operating the said members simultaneously with the doors.

24. In a dump car, doors, downwardly diverging oppositely movable chute members beneath the doors, and fixed chute members beneath and forming continuations of the movable chute members when the latter are in inward position.

25. In a dump car, doors, laterally separated chute members spaced downwardly from the doors and sloping toward opposite sides of the car with an unobstructed vertical passage between and of the width of the space separating said chute members, and chute members between the doors and the first mentioned chute members and mounted to move apart for center dumping.

26. In a dump car, doors meeting at the center of the car, fixed and laterally separated chute members spaced downwardly from the doors and sloping toward opposite sides of the car, and laterally movable downwardly diverging chute members between the doors and the fixed chute members and joining together beneath the meeting edges of the doors.

27. In a dump car, a door for the bottom thereof, means for moving the door laterally bodily, the door being mounted to swing vertically on said means, and means for controlling such swinging.

28. In a dump car, a pair of downwardly converging doors, actuating means for each door connected thereto beneath the upper edge of the door for moving the door bodily toward and from closed position, and means at the upper edge of the door for controlling the swinging thereof.

29. In a dump car, a horizontally movable door for the bottom thereof mounted to swing vertically with relation to the means which moves it horizontally, and means affording the inner portion of the door outward movement when the door is open.

30. In a dump car, a pair of doors, separate operating means for each door for opening and closing the same, a corresponding pair of chute members beneath the doors and movable laterally toward and from each other, means for connecting the chute members with the respective door operating means, and connecting means for causing the door-operating means to work in unison.



31. In a dump car, center sills offset downwardly opposite the discharging portion of the hopper.

32. In a dump car, center sills offset downwardly opposite the discharging portion of the hopper, and means above the sills controlling the discharge of material from the hopper.

33. In a dump car, center sills offset downwardly and laterally opposite the discharging portion of the hopper.

34. In a dump car, center sills having end portions at the car ends and downwardly and laterally offset intermediate portions.

35. In a dump car, center sills having end portions forming inward extensions of the draft beams, the sills having downwardly and laterally offset intermediate portions.

36. In a dump car, laterally separated center sills forming a passage therebetween for center dumping, and chute mechanism for deflecting the material for side dumping.

37. In a dump car, center sills separated laterally and forming a passage for center dumping, and chute mechanism movable above the sills for deflecting the material for side dumping.

38. In a dump car, center sills separated laterally to provide a space for center dumping, laterally separated fixed chute members for directing material to the sides of the car, and movable chute members above the fixed members operative in one position to afford unobstructed center dumping and in another position deflecting the material to the fixed chute members.

39. In a dump car, center sills spaced apart to provide a passage for center dumping, fixed chute members inclined downwardly and outwardly from the sills for side dumping, and movable chute members above the sills for either opening or closing the passage between the latter.

40. In a dump car, downwardly converging doors meeting at the center of the car, laterally separated center sills spaced downwardly from the doors, and a pair of laterally movable chute members adapted to meet beneath the meeting edges of the doors and having top surfaces diverging downwardly and having vertical inner faces adapted to move outwardly to the planes of said sills for center dumping.

41. In a dump car, downwardly converging doors meeting at the center of the car, means for moving the doors laterally, laterally separated center sills spaced downwardly from the doors, laterally movable chute members between the beams and the doors, said members meeting at the center of the car and having downwardly diverging top surfaces with fixed chute members extending from the sills and forming continuations of said diverging top surfaces, the movable chute members having vertical

meeting faces which move outwardly to the planes of the sills for center dumping.

42. A dump car having a downwardly sloping bottom member, means for opening the car bottom to permit material to discharge over said member, a fixed chute member positioned downwardly from said bottom member, and a horizontally movable chute member between the latter and the fixed chute member and in one position connecting the same to form a passage for discharging material and in another position moved out of register therewith to permit the material to drop vertically from the bottom member.

43. In a dump car, laterally movable doors for the bottom thereof, transverse door operating shafts, laterally movable chute members beneath the doors, a transverse shaft with members projecting from the chute members movable longitudinally of the shaft, and devices on the shaft engaged by said members and moved by the shaft into and out of operative connection with the doors.

44. In a dump car, laterally movable doors for the bottom thereof, laterally movable chute members beneath the doors, a transverse rock shaft, arms projecting from the chute members and embracing and slidable on the rock shaft, and lugs on the rock shaft movable with said arms and adapted to be turned by the rock shaft into engagement with the doors.

45. In a dump car, an open bottom hopper, transverse plates depending from the hopper, door mechanism operative between the plates, chute mechanism beneath the doors, and center sills traversing the space between the plates with the chute mechanism secured thereto.

46. In a dump car, an open bottom hopper, transverse plates depending from the hopper, doors operative between the plates, fixed lower chute members between the plates, and upper chute members movable laterally bodily between the plates and in one position cooperating with the fixed chute members for side dumping and in another position providing for center dumping.

47. In a dump car, transverse plates depending from the hopper, doors operative between the plates, and door supporting means at the outer sides of the plates with the latter open to give access to the supporting means.

48. In a dump car, transverse plates depending from the hopper, doors operative between the plates, and door supporting and door actuating means at the outer sides of the plates with the latter open to afford access thereto.

49. In a dump car, transverse plates depending from the hopper, doors, movable



chute mechanism between the plates and beneath the doors, and chute supporting means at the outer sides of the plates with the latter slotted to afford access thereto.

5 50. In a dump car, transverse plates depending from the hopper, doors movable bodily laterally between the plates, trunnion supports for each door with the plates slotted for the movement of said supports,  
10 actuating means at the outer sides of the plates for the supports, the plates having other slots and additional supports for the doors movable therein, said other supports being of a form to permit the doors to oscillate on their trunnion supports.

15 51. In a dump car, transverse plates depending from the hopper, doors movable bodily laterally between the plates, trunnion

supports for the doors sustained at the outer sides of the plates with the latter slotted 20 transversely for the movement of the trunnions, means at the outer sides of the plates for actuating the supports, the plates having other slots of irregular form bearing fixed relation to the first mentioned slots, and additional supports for the doors movable in 25 said other slots for determining the oscillating movement of the doors on their trunnion supports.

In testimony whereof I affix my signature 30 in presence of two witnesses.

CHARLES H. CLARK.

Witnesses:

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