C. F. RICE.

DUMPING CAR.

APPLICATION FILED MAR. 29, 1913.

1,089,964.

Patented Mar. 10, 1914.

5 SHEETS—SHEET 1.

Fig. 9.

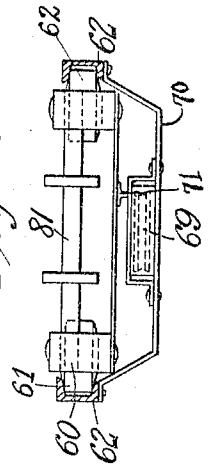
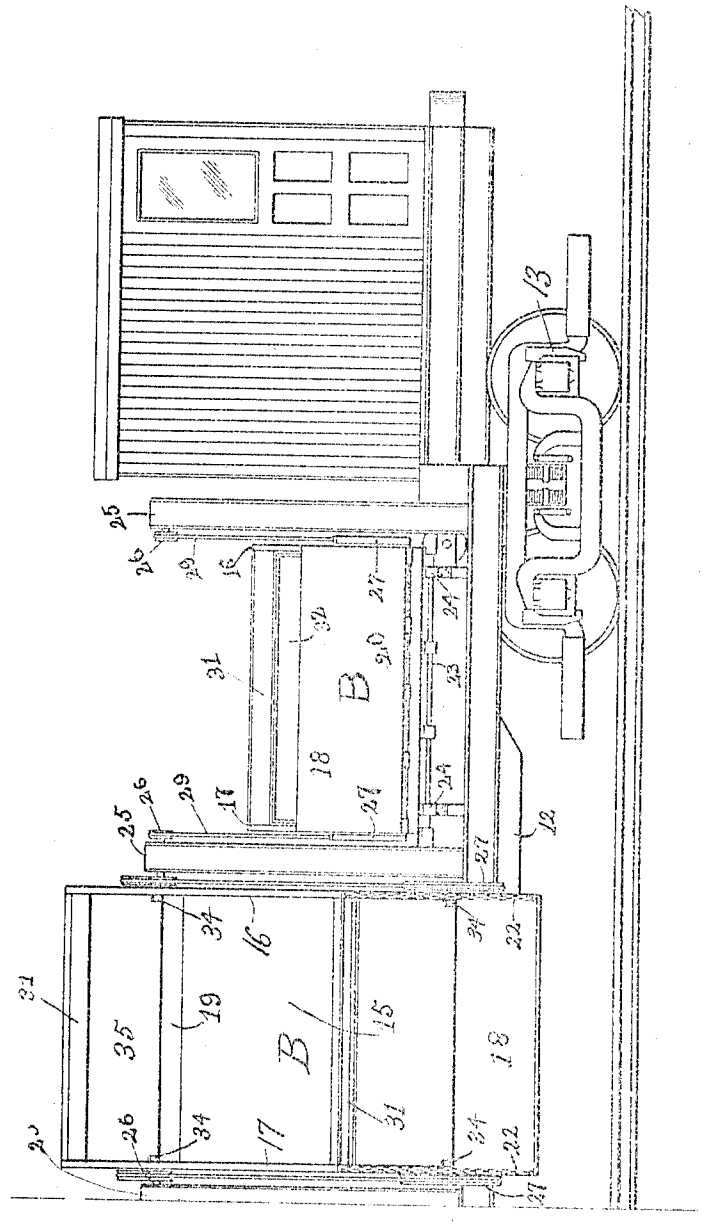


Fig. 1.



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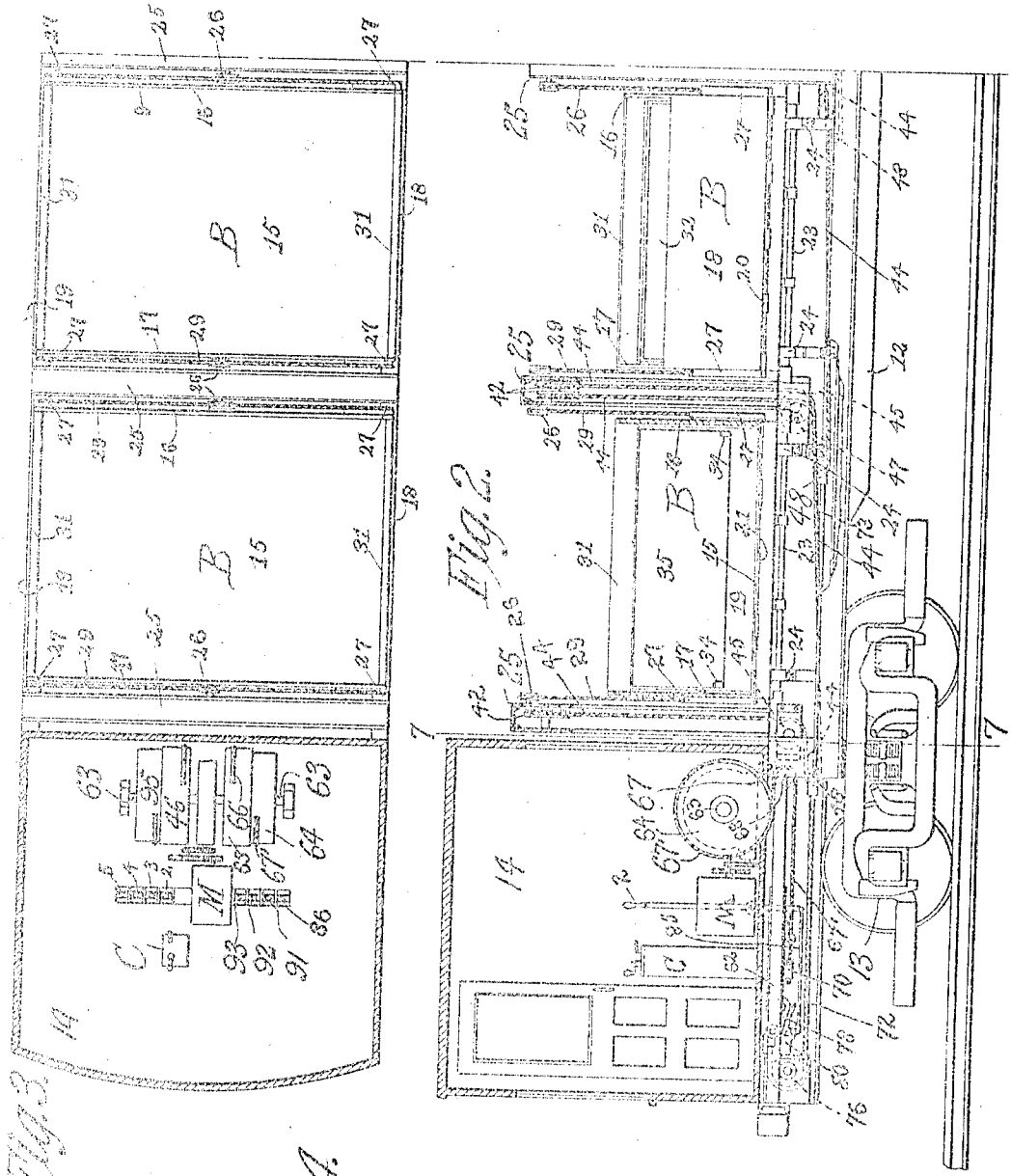


Fig. 2.

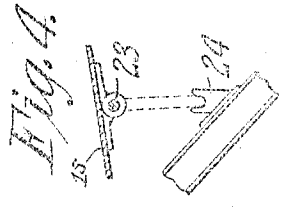


Fig. 4.

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5 SHEETS—SHEET 3.

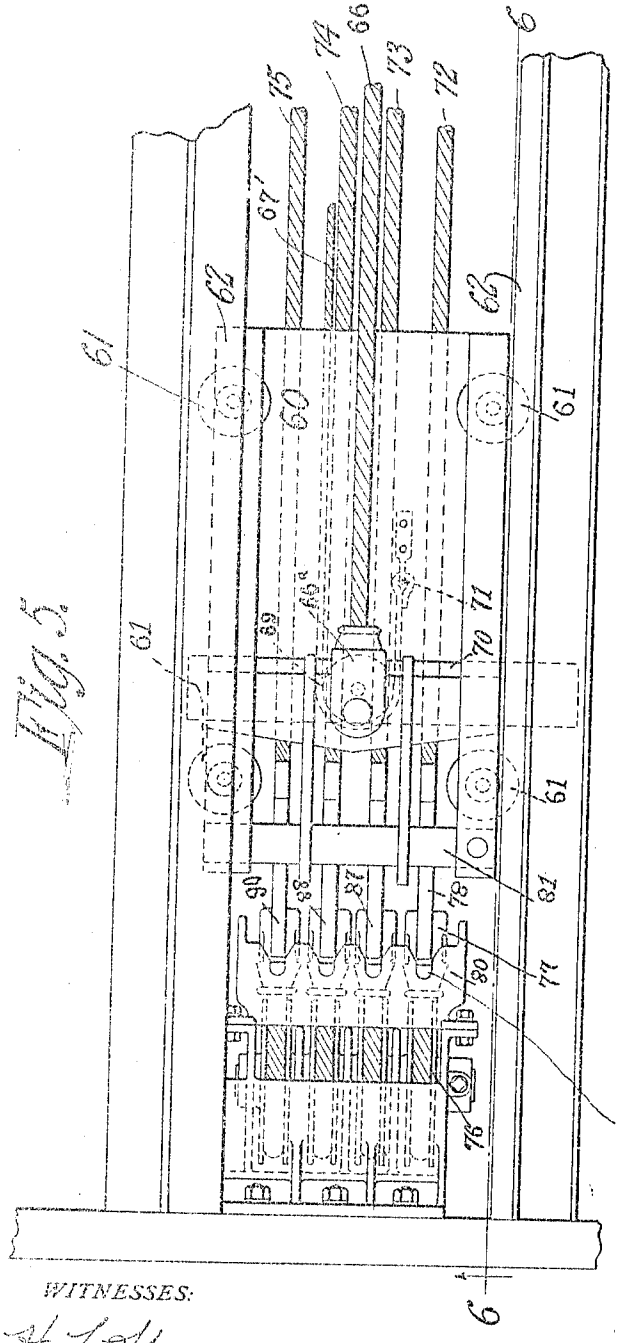


Fig. 5.

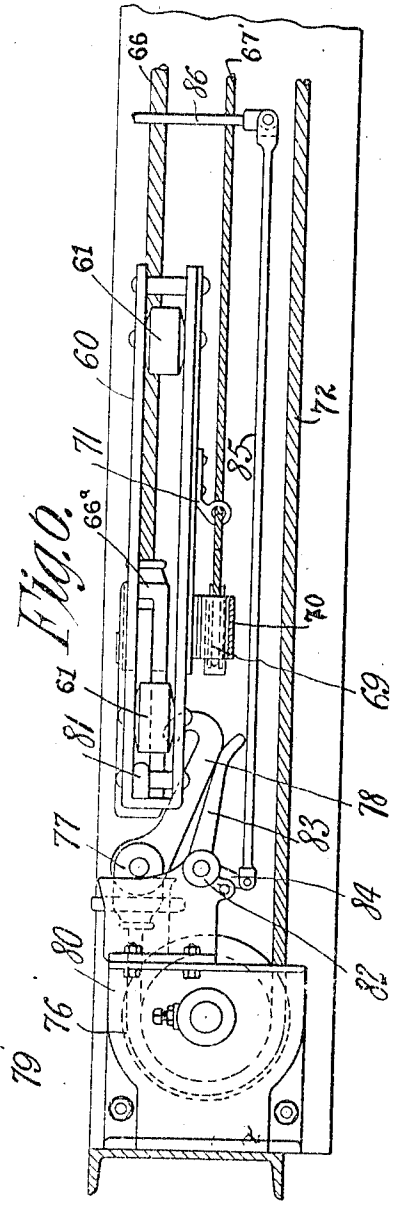


Fig. 6.

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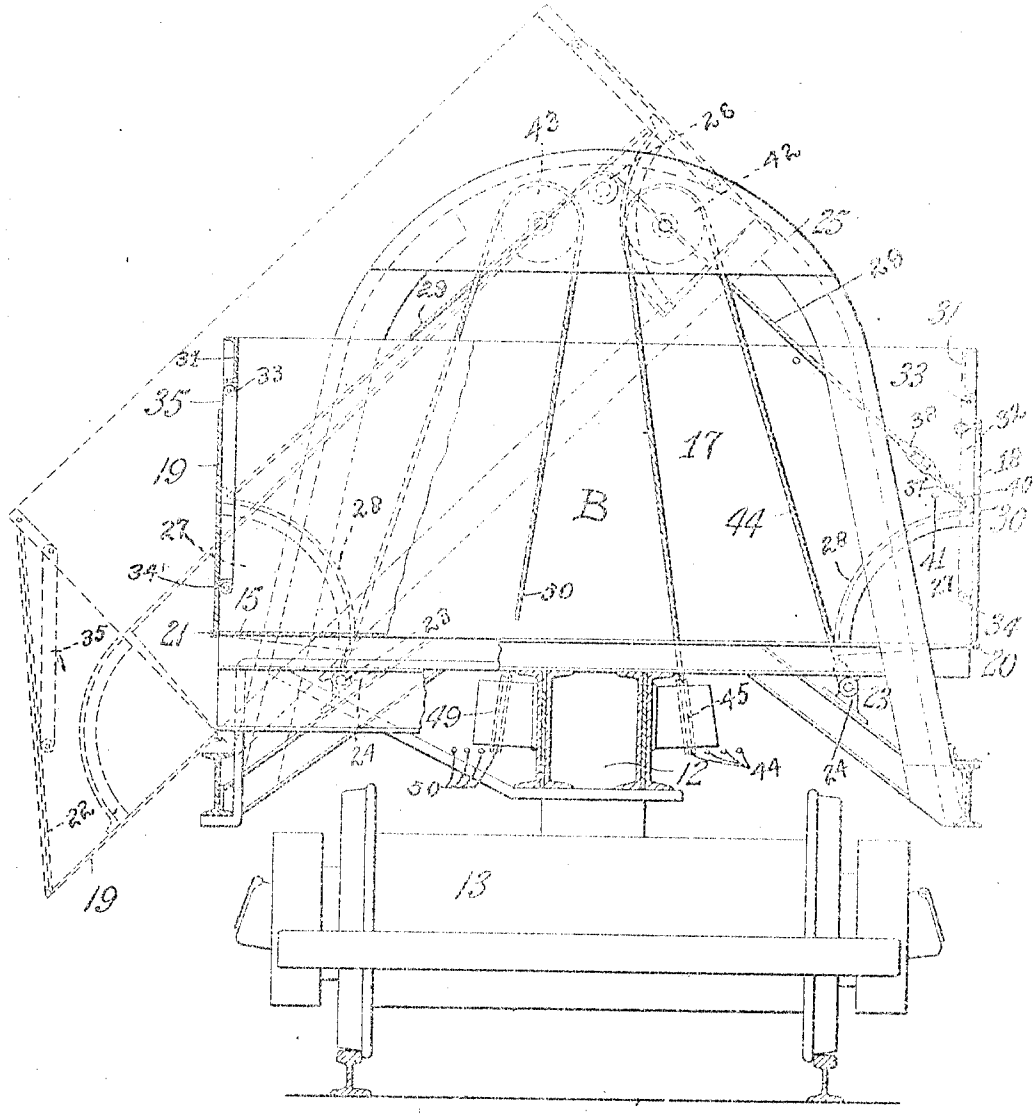
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5 SHEETS—SHEET 1.

Fig. 1.



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1,089,964.

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6 SHEETS—SHEET 5.

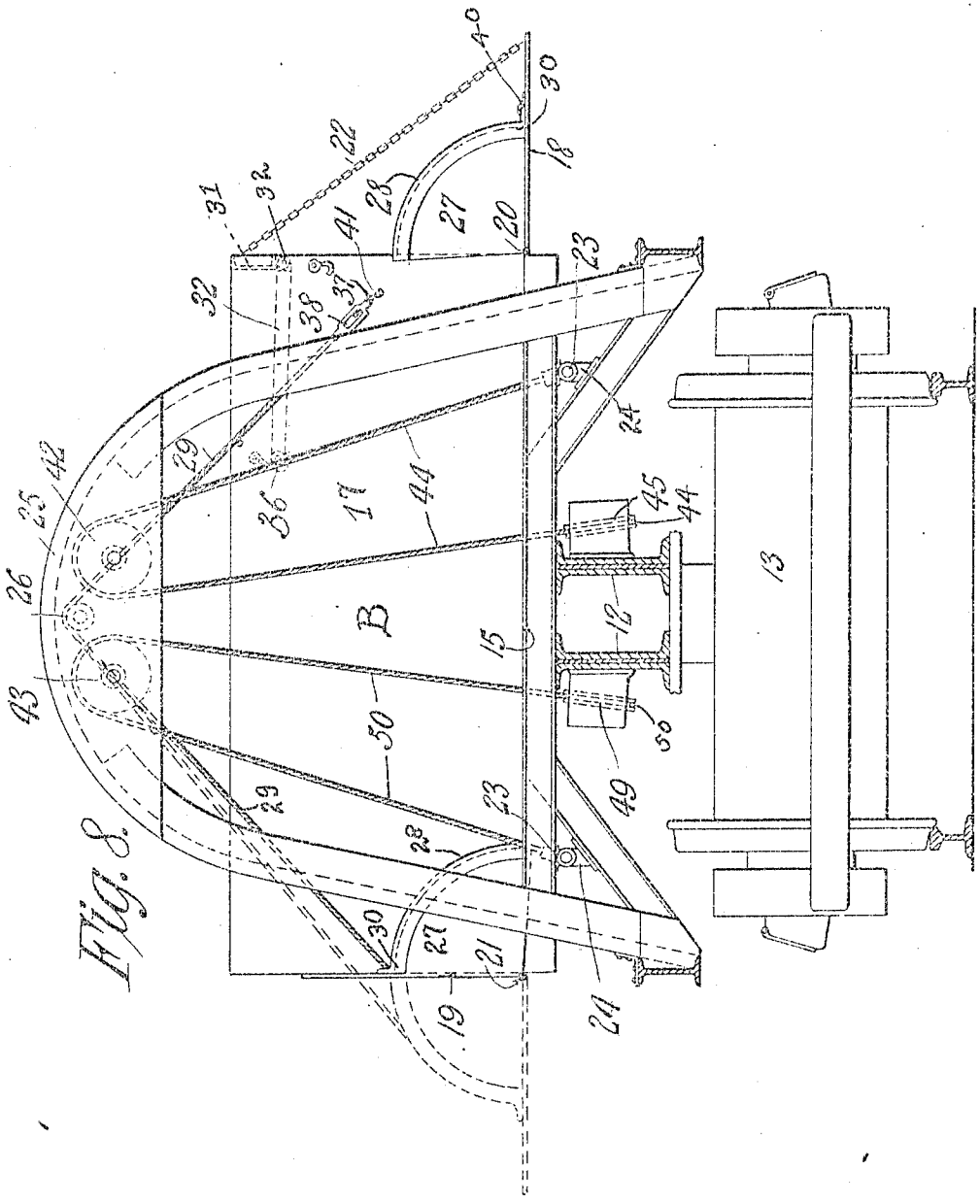


Fig. 8.

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UNITED STATES PATENT OFFICE.

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DUMPING-CAR.

1,089,964. Specification of Letters Patent. Patented Mar. 10, 1914.

Application filed March 29, 1913. Serial No. 757,536.

To all whom it may concern:

Be it known that I, CLIFFORD F. RICE, a citizen of the United States of America, and resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Dumping-Cars, of which the following is a full, clear, and exact description.

The principal object of this invention is to provide a dumping car with a plurality of dumping boxes thereon that are mounted to tilt to dump the contents of any box at either side of the car as it may be desired; and to further provide means on the car, such as a power device, that can be caused to connect at will with any one of the boxes and to tilt the box to either side of the car to discharge its contents, and to thereupon return the box to normal position.

A further object is to provide in such a device an actuating member in the form of two heads or slides which can be moved in one direction or the other at will under the control of the operator; and to further provide a pair of cables connected with each of the boxes, together with a set of operating members which will serve to effect a connection between any of the said cables and one of the said heads, to thereby swing the box to the desired side of the car to discharge its contents, and then the box and also the head are returned to normal position and the head is disconnected from such box.

Another object is to provide in connection with a box on the car which tilts to discharge its contents a cable having its connection with the box at opposite portions, and a sheave engaging the intermediate portion of such cable and connected with an actuating member whereby an equal draft is exerted on the two sides of the box.

Another object is to provide a dumping box which is supported to tilt to both sides of the car, with a gate on each side, which gates are connected with a flexible member which engages a suitably fixed member on the car frame whereby the gates are held closed in the normal position of the box and when the box is tilted to either side, the gate on the lowermost side will swing open to discharge, and which means will, on the return of the box to normal position, swing the gate back to the closed position.

A further object is to provide in connection with the swinging gate on each side of the car, a second gate also hinged to the car and adjacent the said gate, and which is permitted to open and caused to close by the movement of the said gate from its described actuating means.

In the accompanying drawings showing one embodiment of my invention:—Figure 1 is a side elevation of one end portion of a car showing a pair of dumping boxes. Fig. 2 is a sectional elevation of the other end portion of the same car. Fig. 3 is a plan view of the operating compartment at the end of the car. Fig. 4 is a detail view showing the form of movable trunnion for the boxes. Fig. 5 is a plan view showing, enlarged, the sliding head and the connection with the cables. Fig. 6 is a side elevation of parts shown in Fig. 5. Fig. 7 is a transverse section through the car on the line 7—7, Fig. 2, showing the box broken at one end. Fig. 8 is a view similar to Fig. 7; but showing different conditions and relations. Fig. 9 is a detail view below the traveling head.

Only one end portion of the dumping car is shown in which there is a main box beam or frame 12 mounted on a truck 13, it being understood that another truck is arranged at the other end of the beam.

At one end of the car frame is shown a compartment 14 for the operator in which the motor may be mounted and the control therefor and also the operating levers. Beyond the compartment are arranged a plurality or series of dumping boxes denoted generally by B;—two only are shown, but it is understood that any convenient number may be arranged on the car.

The boxes are shown as each comprising a bottom 15 having end members 16 and 17 suitably secured to the bottom.

Gates 18 and 19 are arranged on the opposite sides of the car hinged to the bottom 15 at 20 and 21, to swing from the normal upright position outwardly to a position parallel with the bottom of the car, as indicated in Fig. 8, and each gate may be secured in this position by a chain 22 on each side of the gate.

At each side of the box along its bottom is a trunnion rod 23 which at the ends of the box engages the trunnion brackets 24 shown separately in Fig. 4.

When the box has an upward pressure exerted on either side of it it will swing on the

trunnion on the opposite side of the car, as indicated in broken lines in Fig. 7, and the gate being permitted to open outwardly to a position parallel with the car bottom, as shown, the contents of the box will be discharged by gravity at such side of the car. It will be obvious from this view that the box can take a similar position to dump at the opposite side of the car, and the gate at the lower side will open to discharge the contents.

To facilitate loading the car, the gates may be placed in the open position as shown at the right of Fig. 8. Means are also provided for automatically permitting one of the gates to swing open when the box is tilted, and which will return the gate to closed position when the box is returned to normal position.

At each end of each box is a frame 25 and at the middle portion is a sheave 26 positioned a short distance above the box. A cable 29 passes around the sheave 26, and has its extremities secured to the gates respectively.

It will be seen by comparing Figs. 7 and 8 that when the box swings to either side, the portions of the cable 29 on either side of the sheave will change their angle, and the gate will be permitted to swing down by gravity; but as the box is righted, the cable will be put under tension to return the open gate to its closed position. This operation is facilitated by providing at each end of each gate a segment plate 27 concentric with the axis of the gate, and which has its curved edge 28 grooved to receive the cable which has its extremities secured at the upper portion 30 of the plate; which will result in the cable constantly exerting a strain which is perpendicular to the axis of the gate and at a place about midway between its axis and its outer edge, as indicated in Fig. 7.

On each side of the box B, a plate or beam 31 extends across, secured to the opposite sides 16 and 17; and at the lower edge of this plate is secured a second gate 32 hinged at 33 on a horizontal axis adjacent the plate, and which gate is free to swing inwardly or outwardly, but normally hangs vertically adjacent the inner face of the gate 18, and may be provided with a friction roller 34 at its lower edge. A similar second gate 35 is arranged on the other side of the box engaging the inner face of the gate 19; and when the box is tilted as indicated in Fig. 7, as the gate 19 swings downward to its open position, it will permit the upper gate 35 to swing outwardly and maintain a substantially vertical position, the material in the box finding exit beneath the lower edge of this gate 35. When the box is again righted, the gate 35 will swing back to its normal vertical position at the side of the box, assisted by engagement of the lower gate 19 with the roller on the lower edge of the upper gate.

To facilitate filling the box, when the gate 18 is supported in horizontal position by the chain 22, as indicated in Fig. 8, the upper gate 32 can be swung inward by the attendant to a horizontal position and there maintained by a hook 36, as shown in this view in broken lines; which will permit the material to be thrown into the box beneath this second gate and its supporting plate 31.

In order to permit either of the gates to be opened when the box is horizontal, the cable 29 is provided at each end with a hook 37 connected with the cable by a turn buckle 38, which hook engages a suitable eye 40 on the plate 27, and can be readily disconnected from the gate, and connected with a suitable pin 41 on the side of the box, which arrangement is duplicated on the other side of the box and arranged at each end of the two cables.

At each end portion of each box, on the frame 25, are arranged sheaves 42 and 43 on opposite sides of the middle of the box, and a cable 44 has one end secured to the box at the trunnion rod 23, thence passes outwardly and around the sheave 42 and then downward and around a sheave 45 mounted on the box beam 12 of the car. On the same side of this box the cable 44 has its extremity secured to the other end of the trunnion rod 23 and passes around a sheave similarly located to the sheave 42 and passes around a sheave 49 carried by the beam 12. The intermediate portion of this cable 44 passes around a free sheave or block 48, shown in Fig. 2, so that when drawn lengthwise of the car will produce an equal draft on the two sides of the box B to elevate this side of the box, causing it to dump on the opposite side of the car. On the other side of this box B a sheave 49 on the beam 12 receives a cable 50 passing around the sheave 43 on the frame and secured to the extremity of the trunnion rod 23 on this side; the two ends of the cable 50 being arranged in this manner at the two opposite portions of the box, and the intermediate portion of the cable will engage a free sheave corresponding to the described sheave 48 and operating in the same manner when advanced lengthwise of the car; but obviously operating to elevate this other side of the box and to tilt it in the opposite direction.

It is to be understood that each one of the boxes B is provided with the same form of a pair of free sheaves that will serve to tilt the box to either side of the car according to which sheave is actuated, and when these sheaves are released and permitted to return, the box will return by gravity to its normal position.

Referring now to Figs. 1–6, a head 60 is mounted to slide horizontally below the

floor of the compartment 14 having wheels 61 on opposite sides running in suitable guides 62 whereby the head can be reciprocated longitudinally of the car.

In the compartment 14 is mounted a shaft 63 on which are a pair of drums 64 and 65, and to the latter drum is secured a cable 66 passing around a guide sheave 67 and thence horizontally with its ends secured to the head 60, as indicated by 66ª, Figs. 5 and 6; so that when the drum 65 is rotated to wind up the cable the head 60 will be advanced.

To move the head in the opposite direction, a cable 67 is wound around the drum in the opposite direction, and then passes around a guide sheave 68 and horizontally beneath the head and around a guide sheave 69 mounted on a suitable cross bar 70, with the end of this cable secured at the lower part of the head at 71.

The shaft 63 is shown connected by suitable gearing with a motor M to be rotated in either direction at will according to the manipulation of the controller C for the motor.

In Fig. 5, four cables 72, 73, 74 and 75 are shown, each of which will be understood as engaging to one of the sheaves 48, as shown in Fig. 2, and the cable 72 passes around a stationary sheave 76 and has its end secured to a block 77 to which is pivoted a hook 78; which block in the normal position of the car that will draw the cable 72 taut, and is held in a groove or channel 79 in a frame 80, whereby the axis of the hook is held in a horizontal position.

It will be seen from Fig. 6 that the hook 78 has its free end inclined and lying beneath the head 60, which latter carries a cross bar 81, that can be engaged by the hook 78 when the hook is elevated by suitable controlling means, and the head 60 is advanced by the motor and drum. To swing this hook upwardly to position for engagement with the head when advanced, a lever is shown pivoted to the frame 80 at 82 having an arm 83 positioned below the hook to move the hook upward when the lever is swung; the other arm 84 of the lever connecting by a link 85 with an upright lever 86 in the compartment 14; and by swinging this lever the operator can cause the link to have its hook brought into position for engagement with the cross bar 81, and by then causing the drum to turn from the controller, the cross head 60 will be advanced and engaging the hook 78 will cause a draft on the cable 72; and the latter will move the sheave 48 connected with the cable 44 on one of the boxes B whereby the box will be tilted to discharge its contents. Upon reversing the drums, the head 60 will be returned to former position, and the tension on the cable 72 by the weight of the tilted car will cause the cable 72 and the hook 78 to return to normal position; but the head 60 in this return movement will be retracted after the hook 78 has returned to its limit of movement in engagement with the frame 80, so that the bar 81 will move back beyond the bent portion of the hook, and permit the hook to fall by gravity so that upon the next advance of the head 60 this hook and its cable will not be disturbed.

Similar hooks 87, 88 and 90 are provided for the other three cables 73, 74 and 75 and these hooks are controlled by levers 91, 92 and 93, corresponding to the lever 86; by means of which four levers any of the four hooks can be swung up to engage the bar in the cross head, and any one of four boxes B can be tilted to one side of the car.

As indicated in Fig. 3, the cross head and cooperating set of hooks and cables is duplicated, and one of these hooks will connect with the cable 50 on the other side of the box B, whereby when the cable and hook are advanced through the operation of a pair of drums 95 and 46 the box will be swung to tilt on the opposite side of the car from the movement resulting from the advance of the other cross head 60.

A set of four controlling members 2, 3, 4 and 5 serve to swing any of four hooks on this side of the car up to engage the cross head 60, whereby any one of the same four boxes B can be caused to tilt on this side of the car.

I claim:—

1. In a dumping car, the combination of a car frame, a head guided to slide in the frame, a plurality of dumping boxes mounted on the car to swing laterally to dump the boxes, and means for connecting at will any of the boxes with said head to tilt the box to discharge its contents.

2. In a dumping car, the combination of a car frame, a head guided to slide in the frame, a motor on the car arranged to reciprocate the head, a plurality of dumping boxes mounted on the car to swing laterally to dump the boxes, and means for connecting at will any of the boxes with said head to tilt the box to discharge its contents.

3. In a dumping car, the combination of a car frame, two heads guided to slide in the frame, means for causing the heads to move in unison, a plurality of dumping boxes mounted on the car to swing laterally to dump the boxes, means for connecting at will any of the boxes with one of said heads to tilt the box to discharge its contents at one side of the car, and means for connecting at will any of the boxes with the other said head to tilt the box to discharge its contents at the opposite side of the car.

4. In a dumping car, the combination of a car frame, two heads guided to slide in the frame, a plurality of dumping boxes mounted on the car to swing laterally in

two directions to dump the boxes on either side of the car, means for connecting at will any of the boxes with one said head to tilt the box to discharge at one side of the car, and means for connecting at will any of the boxes with said other head to cause the movement of the head to tilt the box to discharge its contents at the opposite side of the car.

5. In a dumping car, the combination of a car frame, two heads guided to slide in the frame, a plurality of dumping boxes mounted on the car to swing laterally in two directions to dump the boxes on either side of the car, means for connecting at will any of the boxes with one said head to tilt the box to discharge at one side of the car, means for connecting at will any of the boxes with said other head to cause the same movement of the head to tilt the box to discharge its contents at the opposite side of the car, a motor mounted on the car frame and arranged to reciprocate said head.

6. In a dumping car, the combination of a car frame, a head guided to slide in the frame, a plurality of dumping boxes mounted on the car to swing laterally to dump the boxes, and means for connecting at will any of the boxes with said head to tilt the box to discharge its contents, the boxes returning by gravity and causing return of the connecting means.

7. In a dumping car, the combination of a car frame, two heads guided to slide in the frame, a plurality of dumping boxes mounted on the car to swing laterally to dump the boxes, means for connecting at will any of the boxes with said head to tilt the box to discharge its contents at the opposite side of the car, the boxes being returned by gravity to normal position and causing return of the said connecting means.

8. In a dumping car, the combination of a car frame, a head guided to slide in the frame, a plurality of dumping boxes mounted on the car to swing laterally to dump the boxes, a cable connecting with each of the boxes to swing the same when advanced, a hook on the end of each cable normally positioned adjacent the head in the normal position of the head, a set of operating levers for each of the hooks arranged to shift the hook into position for engagement with the head whereby the advance of the head will effect its connection with the cable for the hook and cause the appropriate box to be dumped.

9. In a dumping car, the combination of a car frame, a head guided to slide in the frame, a plurality of dumping boxes mounted on the car to swing laterally to dump the boxes, a cable connecting with each of the boxes to swing the same when advanced, a hook on the end of each cable normally positioned adjacent the head in the normal position of the head, a set of operating levers for each of the hooks arranged to shift the hook into position for engagement with the head whereby the advance of the head will effect its connection with the cable for the hook and cause the appropriate box to be dumped, the boxes being returned to normal position by gravity and thereby retracting the connected cable and hook, the hooks being shifted by gravity away from engaging position with the head upon return of the head to normal position.

10. In a dumping car, the combination of a car frame, two heads guided to slide in the frame, a plurality of dumping boxes mounted on the car to swing laterally in both directions from the normal upright position to dump the boxes on either side of the car, a cable connecting with each of the boxes to tilt the box to one side of the car when advanced, a second cable connecting with each of the boxes to swing the same to the opposite side of the car, a hook on the end of each said cable which is normally positioned in proximity to one of said heads in the normal position of the head but free from engagement therewith when the head is moved, a set of operating levers, one for each of the hooks, and arranged to shift the hook into position for engagement with the head whereby advance of the head will effect its connection with the cable of the hook selected and cause the appropriate box to be dumped.

11. In a dumping car, the combination of a car frame, two heads guided to slide in the frame, a plurality of dumping boxes mounted on the car to swing laterally in both directions from the normal upright position to dump the boxes on either side of the car, a cable connecting with each of the boxes to tilt the box to one side of the car when advanced, a second cable connecting with each of the boxes to swing the same to the opposite side of the car, a hook on the end of each said cable which is normally positioned in proximity to one of said heads in the normal position of the head but free from engagement therewith when the head is moved, a set of operating levers, one for each of the hooks, and arranged to shift the hook into position for engagement with the head whereby advance of the head will effect its connection with the cable of the hook selected and cause the appropriate box to be dumped, the boxes being returned to normal position by gravity thereby retracting the connected cable and hook, the hooks being shifted by gravity away from engaging position with the head upon return of the head to normal position.

12. In a dumping car, the combination of a car frame, a head guided to slide in the frame, a motor mounted on the frame, a pair of drums on the frame secured together

and arranged to be rotated in either direction at will from the motor, cables connecting said drums respectively and said head to reciprocate the head from the motor, a plurality of dumping boxes mounted on the car to swing laterally in both directions from the normal upright position to dump the boxes on either side of the car, a cable connecting with each of the boxes to tilt the box to one side of the car when advanced, a second cable connecting with each of the boxes to swing the same to the opposite side of the car, a hook on the end of each said cable which is normally positioned in proximity to one of the said heads in the normal position of the head but free from engagement therewith when the head is moved by the motor, a set of operating levers, one for each of the hooks, and arranged to shift the hook into position for engagement with the head whereby advance of the head by the motor will effect its connection with the cable of the hook selected and cause the appropriate box to be dumped, the boxes being returned to normal position by gravity, thereby retracting the connected cable and hook, the hooks being shifted by gravity away from engaging position with the head upon return of the head by the motor to normal position.

13. In a dumping car, the combination of a car frame, two heads guided to slide in the frame, a motor mounted on the frame, two pairs of drums on the frame secured together and arranged to be rotated in either direction at will from the motor, cables connecting said drums respectively and said heads to reciprocate the heads from the motor, a plurality of dumping boxes mounted on the car to swing laterally in opposite directions to dump the boxes on either side of the car at will, means for connecting at will any of the boxes with one said head to tilt the box from movement of the head to discharge its contents at one side of the car, and means for connecting at will any of the boxes with said other head to tilt the box from movement of the head to discharge the contents of the box at the opposite side of the car.

14. In a dumping car, the combination of a car frame, a box mounted on the frame to tilt, an actuating cable for tilting the box, a sheave secured to the end of said cable, and a second cable having its extremities secured to opposite sides respectively of the box with its intermediate portion passing around said sheave whereby the advance of said other cable will cause the sheave to draw the box cable to exert equal tension on the two sides of the box.

15. In a dumping car, a dumping box mounted on the car to tilt, the box having on one or both sides a gate hinged along the bottom edge at the side of the box, and a second gate hinged parallel with the axis of said gate at the upper portion of the car side and depending to engage the inner face of the lower gate.

16. In a dumping car, a dumping box mounted on the car to tilt, the box having on one or both sides a gate hinged along the bottom edge at the side of the box, a second gate hinged parallel with the axis of said gate at the upper portion of the car side and depending to engage the inner face of the lower gate, and a plate extending across the side of the car in proximity to the second gate.

17. In a dumping car, a dumping box mounted on the car to tilt, the box having on one or both sides a gate hinged along the bottom edge at the side of the box to swing outward and downward as the box is tilted to that side, a segment plate secured to one or both side edges of the gate and concentric with its axis, the segment having a groove in its curved edge, and a cable secured in the grooved edge for returning the gate to upright position after the box has been dumped.

18. In a dumping car, a dumping box mounted on the car to tilt, the box having on one or both sides a gate hinged along the bottom edge at the side of the box to swing outward and downward as the box is tilted to that side, a segment plate secured to one or both side edges of the gate and concentric with its axis, the segment having a groove in its curved edge, and a cable secured in the grooved edge for returning the gate to upright position after the box has been dumped, and a second gate hinged parallel with the axis of said gate at the upper portion of the car side and depending in engagement with the inner face of the other gate, and being free to swing outward as the other gate opens upon the box being tilted, the second gate being returned to normal position as the other gate is returned by said cable.

19. In a dumping car, a car frame, a box mounted on the car to tilt to both sides of the car, a swinging gate on each side of the box, fixed guides on the car, one at each side of the box, and a flexible member at each side of the box having its extremities secured to the gates respectively and the passing over the guides respectively whereby when the box is tilted to either side the cable will permit the gate on the lowermost side to swing outwardly to dump the box, and when the box is returned to normal position the cable will return the gate to normal upright position.

20. In a dumping car, a car frame, a box mounted on the car to tilt to both sides of the car, a swinging gate on each side of the box, fixed guides on the car, one at each side of the box, and a flexible member at each side

of the box having its extremities secured to the gates respectively and the passing over the guides respectively whereby when the box is tilted to either side the cable will permit the gate on the lowermost side to swing outwardly to dump the box, and when the box is returned to normal position the cable will return the gate to normal upright position, a segment plate secured to both side edges of each gate and having its curved edge grooved, said cables having their extremities secured to the segment plates to engage the grooved portions as the gates are swung.

21. In a dumping car, a car frame, a box mounted on the car frame to tilt to both sides of the car, a swinging gate on each side of the box, a sheave on the car frame located above the middle portion of one side of the box, and a cable passing over said sheave with its extremities secured to the gates respectively, permitting the gate at the lowermost side of the box when tilted to swing downward to dump the box, the cable serving to return the open gate when the box is returned to normal position.

22. In a dumping car, a car frame, a box mounted on the car frame to tilt to both sides of the car, a swinging gate on each side of the box, a sheave on the car frame located above the middle portion of one side of the box, and a cable passing over said sheave with its extremities secured to the gates respectively, permitting the gate at the lowermost side of the box when tilted to swing downwardly to dump the box, the cable serving to return the open gate when the box is returned to normal position, a segment plate secured to each gate concentric with its axis and having its curved edge groove, said cable having its extremities secured at said grooved edge of the plates and working in the grooves whereby to exert a draft on the gate at a point remote from its axis during the entire swinging of the gate.

23. In a dumping car, a car frame, a box mounted on the car frame to tilt to both sides of the car, supports one at each end of the box, a sheave on each side of the middle portion of each support, a pair of cables at each end of the box, each cable passing around one of said sheaves, and secured to the box in proximity to the outer side thereof, sheaves on the car frame below said supports, one for each of the said cables, one of said pairs of cables serving to tilt the box to one side of the car, and the other pair of cables serving to tilt the box to the other side of the car.

24. In a dumping car, a car frame, a box mounted on the frame to tilt to both sides of the car, a support at each end of the box carried by the car frame, a pair of sheaves on each support, a pair of sheaves located on the car frame below said sheaves at each side of the box, a cable having its ends secured to the box on opposite portions at one side of the box and passing around one of the upper sheaves at each end of the box and thence around a lower sheave at each end of the box, said cable at its intermediate portion engaging a free sheave, an actuating member on the frame connected through the latter sheave to effect the tilting of the box at said side, a second cable having its end secured to the box at opposite portions on the other side of the box and passing around the other two sheaves respectively at the upper portion of the support and thence around said other two lower sheaves, said latter cable at its intermediate portion engaging a free sheave, and an actuating member on the frame connected with the latter sheave to tilt the box on the other side of the car.

Signed by me at Springfield, Mass., in presence of two subscribing witnesses.

CLIFFORD F. RICE.

Witnesses:
WM. S. BELLOWS,
G. R. DRISCOLL.