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A. R. PIPER.
DUMPING VEHICLE.
APPLICATION FILED NOV. 27, 1908.

Patented Aug. 23, 1910.

3 SHEETS—SHEET 1.

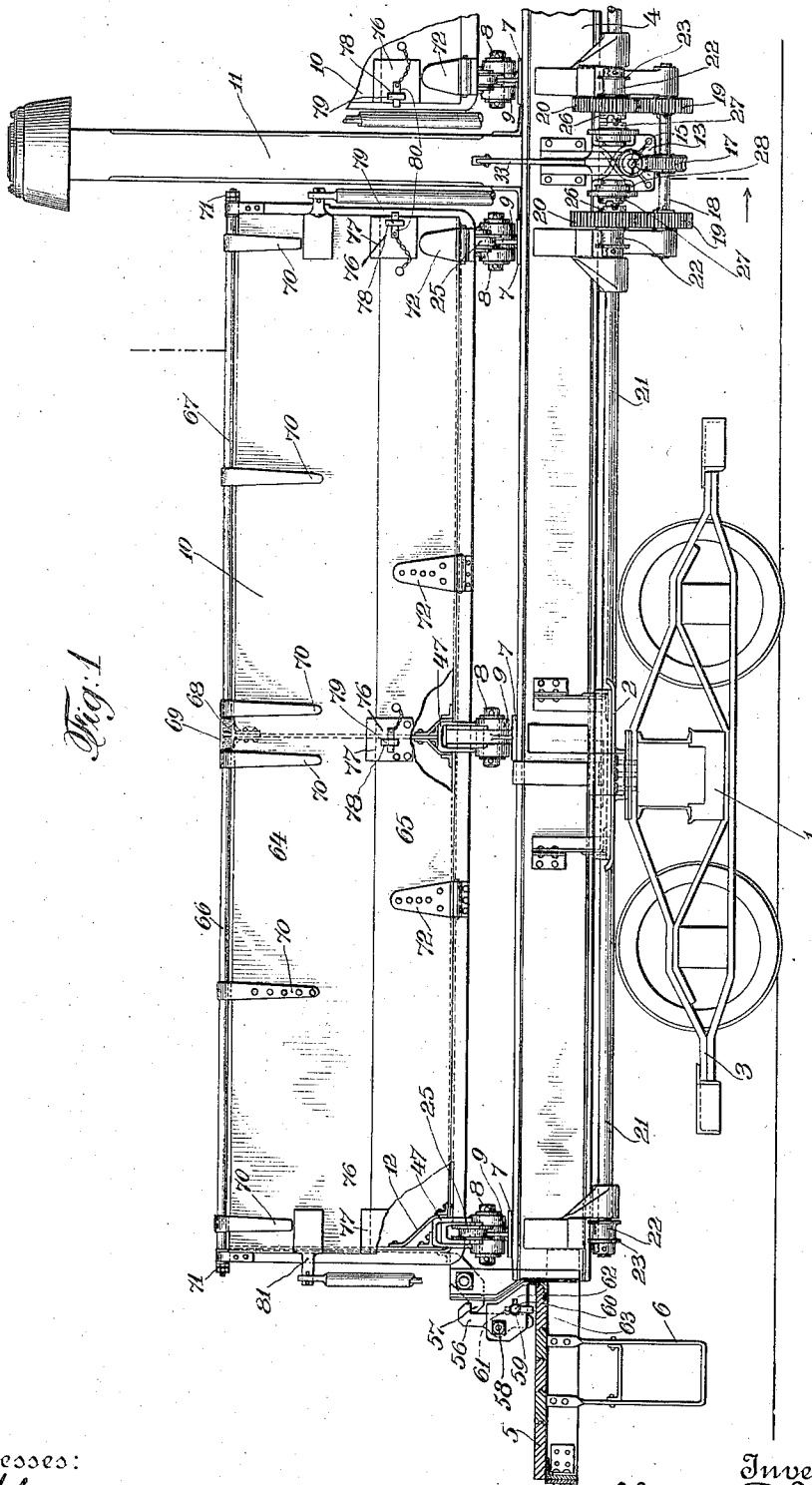


Fig. 1

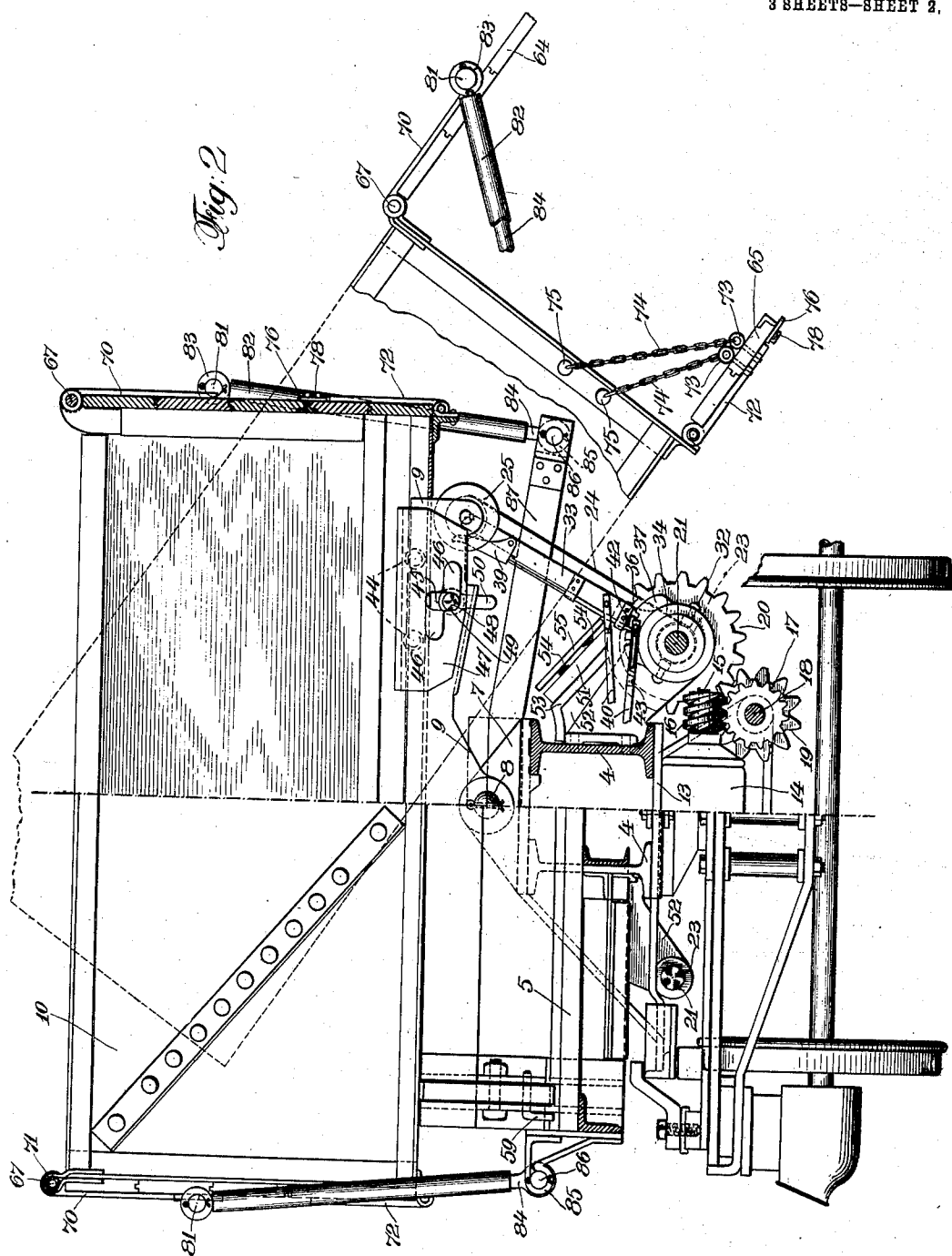
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Alexander R. Piper
By his Attorneys
Prindle Wright

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3 SHEETS—SHEET 2.



Witnesses:
M. Meikle.
A. Newcomb

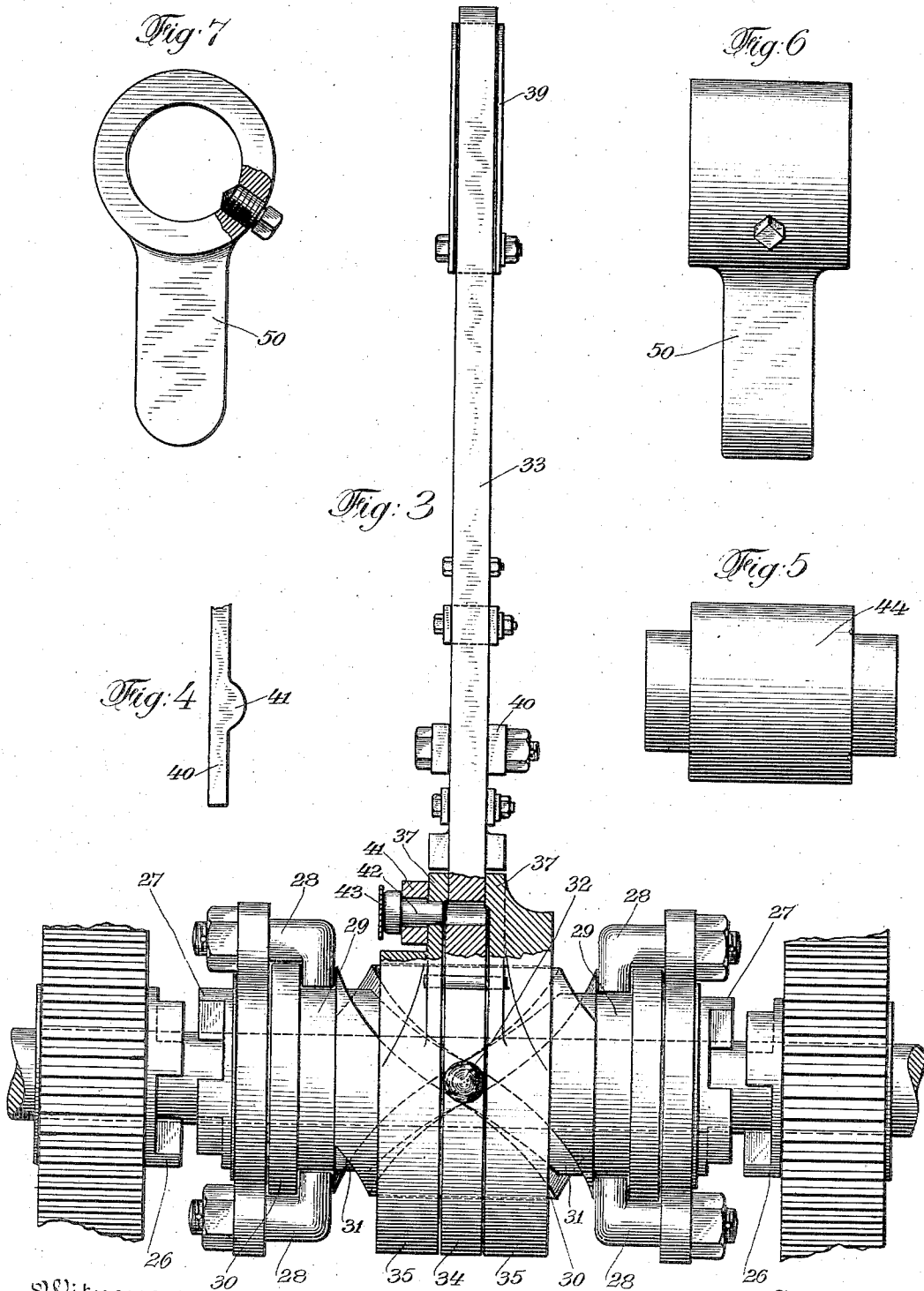
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By his Attorney,
Pumle & Wright

UNITED STATES PATENT OFFICE.

ALEXANDER ROSS PIPER, OF BROOKLYN, NEW YORK.

DUMPING-VEHICLE.

967,970.

Specification of Letters Patent. Patented Aug. 23, 1910.

Application filed November 27, 1908. Serial No. 464,575.

To all whom it may concern:

Be it known that I, ALEXANDER R. PIPER, of Brooklyn, in the county of Kings and in the State of New York, have invented a certain new and useful Improvement in Dumping-Vehicles, and do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to an improvement in dumping vehicles of any character, but more especially dumping cars. In accordance with the principles of my invention, I have found it desirable to provide a car with a vertical elevation as small as possible and so constructed that the material carried in the car body can be readily and quickly dumped from the car and at as great a distance as possible from the car track.

More particularly, the object of my invention consists in letting the bolsters upon which the car body is supported into the body of the car itself so as to lower the center of gravity of the car and therefore the load carried thereby to as great an extent as possible, and also to lower the entire vertical height of the car so as to create a greater clearance when the car is hauled through tunnels or under other overhead obstructions.

A further object is to construct the dumping doors on the sides of the car so that a portion of the door, *i. e.*, the lower part thereof, will be adapted when open to form an extension of the floor of the car for the purpose of depositing the material being dumped from the car as far from the car track as is possible. I also so construct the upper side doors, that is to say, the doors which are located above the lower doors constituting when open an extension of the car floor, so that these upper doors are supported in such a way that the greatest possible clearance is obtained for the escape of the material being unloaded.

A further important feature of my invention consists in the manner in which I construct the particular attachments for allowing the car body to receive a jolt at the downward end of its path so as to more effectively loosen up and discharge the material being unloaded.

Figure 1 is a side elevation of a portion of the dumping car; Fig. 2 is a transverse section of the same; Fig. 3 is a vertical elevation partly in section of the clutch mechanism; Fig. 4 is a plan view of a portion

of the interlocking mechanism; Fig. 5 is an elevation of one of the rollers used for supporting the car body; Fig. 6 is a front elevation of a trigger arm used in the construction; and Fig. 7 is a side elevation of the same.

In the drawings, 1 is a car truck of any preferred type which is connected to the body supporting mechanism of the car by means of a segmental track 2 for permitting the car truck to turn when the car is proceeding around a curve. Inasmuch as I provide my car 3 with two such trucks 2, one at either end thereof, the body supporting mechanism consists in the main of two longitudinal I beams 4 which extend from one end of the car to the other, at which points they are adapted to support the platforms 5 having the usual appurtenances such as a step 6, etc. The said I beams 4 are connected at their upper faces by means of a series of triangular brackets 7, which are designed to support by means of the pivot pins 8 the bolsters 9 extending transversely of and supporting the car bodies 10, of which there are two on each car, a space being provided between the same in the center of the car for an additional platform, having located thereon a vertical stationary support 11 carrying a trolley connection at its upper end for the current carrying wire located along the route of the track. It will be noted that the bolsters are let into the interior of each of the car bodies at the ends thereof and also in the middle thereof. At these points the bolsters are covered by means of the inclined plates 12 so as to permit the load of material carried in the body of the car over the bolsters to readily escape when the same is tilted.

The tilting mechanism is constructed as follows:—At the center of the car I attach to the lower edges of the longitudinal I beams 4 a depending bracket 13 designed to support an electric motor 14 upon each end of the central shaft 15 of which is located a worm 16. Each of these worms is designed to mesh with a worm gear 17 which is carried upon a shaft 18. The latter shaft 18 also carries a gear 19 fixedly attached thereto which meshes in turn with a gear 20 loosely carried upon a shaft 21 which extends from one end of one of the car bodies 10 to the other. It will thus be seen that there are two such shafts 21 on either side of the car, each of which extends the length

of one of the car bodies 10. Each shaft 21 carries at either end thereof a small drum 22 provided with the usual flanges 23. These drums are designed to be connected by means of chains 24 to the car body 10 by means of sheaves 25 in the ends of bolsters 9. Each of the gears 20 which are located on the shafts 21 is provided on its face which is nearest to the motor mechanism with a clutch member 26 which is adapted to inter-lock with a complementary clutch member 27 splined to the shaft 21. The complementary clutch members 27 carry on their faces which are nearest to the motor mechanism pairs of L-shaped arms 28 which are designed to rotate in grooves 29 in the ends of clutch shipper sleeves 30, which are carried on the inner ends of each shaft 21 on either side of the car. Each clutch shipper sleeve 30 is provided on its periphery with crossed curved grooves 31 in which pins 32 carried by lever arms 33 are designed to slide. Each of the lever arms 33, of which there are two, one on either side of the car, has a narrow sleeve 34 surrounding one of the shafts 21 for the purpose of guiding and supporting the pins 32. The circular portion 34 is located between stationary guides 35 so as to maintain it in its proper position. A series of teeth 36 are located in an extension 37 on either side of the circular guides 35 which are designed to hold the lever in the proper position by means of a reciprocating rod 38 which is normally spring pressed into the lowermost position and designed to be retracted into its uppermost position by means of an auxiliary hand lever 39 located in proximity to the handle of the lever 33.

It will thus be seen by this construction that when one of the levers 33 is moved to either end of its path, the clutch member 26 will be caused to move one of the complementary clutch members into contact with one of the clutch members carried by the gears 20, which results in one of the gears 20 being connected so as to rotate with one of the shafts 21 and thereby tilt the car body through the agency of the chains 24. It will also be seen that by the movement of one of these levers in one direction, the car body at one end of the car will be caused to be tilted, while from the movement of the same lever in the other direction the remaining car body will be caused to be tilted toward the same side of the car. Furthermore, when once one of the car bodies has been tilted to one side of the car, the same can be restored to its original horizontal position by the operation of the lever located at the other side of the car so as to restore the car body to its normal position. Before the latter can take place, however, it will be obvious that the lever which has been operated to move the car body into a

dumping position must necessarily be moved so as to disconnect the clutch which effected this movement before the lever on the other side of the car can be operated to restore the car to its normal horizontal position, i. e., when either lever is in use the other is locked in neutral position with both of its clutches thrown out of gear.

In order to insure that the lever has been moved in this way to its middle position so as to disconnect the two elements of the clutch which has effected the tilting movement of the car body, I provide an interlocking mechanism which prevents the lever on the other side of the car from being operated to move the car body into its normal horizontal position until the other lever has been moved to its middle position so as to disconnect the clutch members connected therewith. This is constructed as follows:— I attach to each of the levers 33 a horizontal rod 40 which extends from the lever, to which it is connected by means of a pivot, transversely of the car to the other side thereof, where it carries a beveled shoulder 41 designed to retract a pin 42 carried in the stationary guide 35 and extending through the same to the body of the lever 33 which is provided with a hole to receive the pin when the lever is moved to its middle position. Each of the levers 33 is provided with a controlling rod such as that already described. The result of this arrangement is that when the lever which has been moved to tilt a car body to a dumping position, is then moved again to its middle position to separate the clutch members, the rod 40 pivoted to this lever will come in contact by means of its beveled shoulder 41 with the spring pressed pin 42 so as to retract the same from the opening provided in the body of the lever located on the opposite side of the car against the action of spring 43. The other lever then in this position of the rod 40 is permitted to be moved, and when this occurs the corresponding pin 42 on the other side of the car coöperating with the first mentioned lever is allowed to spring into the opening coöperating therewith so as to maintain the first mentioned lever permanently in its middle position while the remaining lever can be operated to move the car body to its normal horizontal position. Each of the car bodies 10 is adapted to slide to a certain extent at the lower end of its path when tilted so as to give the car body and the load contained therein a sudden jolt for the purpose of more effectively discharging the material therefrom. For this purpose the car body 10 is supported by means of a series of rollers 44 upon the respective bolsters 9.

In order to effect the jolting referred to and at the same time maintain the car body

in its central position, I provide each of the bolsters with vertical slots 45 located at either end thereof which are designed to co-operate with the zigzag slots 46 situated in the U-shaped plates 47 carried by the car body and fixedly attached thereto. Pins 48 are designed to extend through the said slots 45 and 46 so that when the car is in its horizontal and middle position, the said pins 48 on either side of the car will be located immediately in front of the shoulders 49 of the zigzag slots 46, thereby preventing the car from being moved to either side of its central position. I attach to each of the pins 48 at its center a trigger arm 50 which depends therefrom through the longitudinal openings provided within the bolsters 9. These trigger arms 49 and 50 are operated at the lower end of the path of the car body when moved into a tilting position, by contacting with the faces of bumpers 51 attached to the I beams 4. The bumpers 51 comprise polygonal brackets 52 which support the shafts 21, the brackets 52 having inclined faces 53 which support by means of springs 54 plates 55 adapted to receive the car body when it has reached the lower end of its tilting movement. At the same time that the car contacts with the bumpers in this manner, the trigger arms 50 also contact therewith resulting in the pins 48 being pushed upwardly beyond the shoulders 49 on this side of the car. When this takes place the car body is allowed to slide downwardly until the inner ends of the zigzag slots 46 come in contact with the pins 48, resulting in a positive and sudden jolt to the car body so as to effect a more perfect unloading of the material. When the car body has been moved again into its horizontal and central position the pins 48 of their own accord against drop in front of the shoulders 49 so as to hold the car in its central position.

In order to insure that the car shall be maintained in its horizontal and central position in the event of any accident causing a breakage of any part of the tilting mechanism, I provide each of the car bodies at the end thereof adjoining the car platform with safety catches 57 which are designed to co-operate with the pivoted catches 56 supported from the I beams 4 by means of pivots 58. When the car bodies are in their horizontal and central position the catches 56 are designed to over-lie and coöperate with the catches 57 so as to maintain the car bodies in this position.

To insure that the catches 56 shall be permanently maintained in coöperation in this manner with the catches 57 while the cars are being transported from point to point, I provide horizontal movable locking pins 59 adjacent to the inner face of the lower ends of the catch levers 57. These locking pins

consist of a horizontal portion 60 having a small pin 61 projecting therefrom at its center which is designed to keep the horizontal portion from being withdrawn through its socket until the said horizontal portion has been rotated so as to bring the pin 61 into alinement with a small opening 62, at which point the horizontal portion is adapted to be withdrawn in a horizontal direction so as to remove the said horizontal portion from its position across the path of movement of the catch lever 57. The said horizontal portion 60 has attached thereto a vertical extension 63, the purpose of which is to effect the movement of the horizontal portion so as to bring the pin 61 into alinement with the opening 62 and to withdraw the horizontal portion from its socket and the pin through the opening 62 to release the catch lever 57.

Each side of each of the car bodies 10 is provided with a pair of doors, an upper door 64 and a lower door 65. The upper door is suspended from a tie rod 66 and a tie rod 67, each of the tie rods extending along the upper edge of the side of the car body from one end thereof to the center of the side edge, where it is provided with a screw-threaded end 68 for securing it within a screw-threaded sleeve 69 located at the center of the car body. The said suspension is effected by means of a plurality of strap hinges 70 and the said tie rods are secured permanently in their proper positions by means of the lock nuts 71 located on their outer ends. The lower door 65 is supported upon the lower side edge of the car body through the agency of broad strap hinges 72. I support the lower door when in its lower or open position, in such a way that the same shall be maintained parallel to the floor of the car body in order that it shall constitute in this position an extension thereof so as to project the material being dumped from the car body as far to one side of the car track as possible. I effect this by attaching the lower car door 65 to the car body by means of eyelets 73 and chains 74 attached thereto at one end and at the other end to the car body by means of pins 75. The doors 64 and 65 are both designed to be secured in their closed positions by means of common fastenings 76 which consist of plates 77 attached to the lower door at the middle and two ends thereof, having openings 78 for the passage of horizontal bars 79 having openings to receive chain supported pins 80 bars 79 being attached to the two end walls and the central partition of the car body. It will thus be seen that in closing the side doors of the car body, the upper door is closed by gravity and then the lower door is raised by hand and when closed retained in this position by means of the pins 80. The lower door when

so retained in its closed position also retains the upper door in its closed position because of the fact that the plates 77 extend beyond the edge of the lower door and overlie the lower edge of the upper door 64.

The upper section of side door has attached to each end of it a hinge pin 81. A sleeve 82 terminating in a hinge eye 83 incloses an extension and compression rod 84, terminating in a hinge eye 85, which hinge eye is held by hinge pin 86. The stanchion 87 is attached to the longitudinal I-beams 4 of the car, and at each end gives a fixed bearing for the compression rod 84 through its eye 85 on pin 86.

In the operation of tilting the car body 10, the pivot 67 approaches the pivot 86, thereby bringing the compression bar 84 in contact with the inner end of the sleeve 82 at the eye 83, pushing the eye 83 against the pin 81, and forcing the door 64 to open, as indicated in Fig. 2. When the car body is tilted up, the point 67 moves away from the point 86, and no pressure is transmitted from the pin 81 to the pin 86, and the door is permitted to close.

In the operation of the dumping mechanism, the pins 59 are rotated until the pins 61 attached to the horizontal portions thereof come in alinement with the openings 62, when the said pins 59 are withdrawn from in front of the catch levers 56. The said catch levers 56 are then moved out of cooperation with the catches 57 situated on the car body so as to release the car and permit it to be moved to a dumping position. The lever 33 on the side of the car toward which it is desired to dump the material carried thereby, is moved from its middle position so as to operate the clutch located nearest the car body which it is desired to dump. The lever 33 when so moved, releases the spring pin 42 cooperating with the lever 33 located on the other side of the car so as to lock it in its middle position during the time that the other lever 33 is being operated. Upon the clutch being operated as above stated the chains connected to the shaft on which the said clutch is situated are wound around drums provided for that purpose, which results in tilting the car body toward this side of the car. The car continues to tilt until it comes in contact with the bumper plates 54 at which point the trigger arms 50 also come in contact with the said bumper plates resulting in moving the pins 48 upwardly away from the shoulder 49 constituting a portion of the zigzag openings or slots 46. Upon the pins 48 being so released, the car body begins to slide downwardly and continues to so slide until the pins 48 come in contact with the inner ends of the zigzag slots 46, at which point the car body and the load of material contained therein re-

ceives a sudden jolt. The chain supported pins 80 having been previously withdrawn from the apertured bars 79 so as to unlock the side doors, and when the above mentioned jolt takes place, these doors have moved to their open positions, the lower door having assumed a horizontal position constituting an extension of the floor of the car body to which it is attached. The effect of the sudden jolt is, of course, to loosen up the body of material contained within the car so as to cause it to be removed as completely as possible and as quickly as possible from the car body. It will also be seen that because of the particular position in which I support the lower door while open, the material being discharged will be projected to a very great distance to one side of the car track, which is a great desideratum. The car body having thus been tilted to its lowermost position the lever 33 which has effected this operation is moved to its central position so as to disengage the clutch members. This results in releasing the pin 42 from engagement with the lever 33 located on the other side of the car. The latter lever 33 can now be moved so as to cause the engagement of the clutch members located on this side of the car which are designed to operate the car body which has been tilted. At the same time this results in the pin 42 being permitted to engage the other lever 33, that is to say, the one which has been initially operated so as to prevent the latter from being moved during the time that the remaining lever 33 is being operated. The latter now having been moved to cause the clutch members cooperating therewith to become engaged with one another, the car body is gradually raised to its horizontal and central position through the agency of the chains 24 cooperating with the said clutch members. As soon as the car body has reached its horizontal and central position the safety catches 56 and 57 will become automatically engaged with one another so as to retain the car in its normal position for receiving and conveying a load of material. The lever 33 at this point which has effected the elevation of the car to its normal position, is now moved to its central position to disengage the clutch members. When now the chain supported pins 80 are inserted through the apertured bar 79 so as to lock the doors in their closed positions and the pins 59 are moved horizontally across the path of movement of the safety catches 56, the car is again in its properly adjusted position to receive a new load of material to be conveyed to any desired point.

While I have described my invention above in detail, I do not wish or intend that I shall be limited thereby, but consider that

my invention is a broad one and capable of many changes without departing from the spirit thereof.

The dumping mechanism is applicable to other devices than dumping cars, such, for example, as dumping barges and scows. It is even conceivable that the said dumping mechanism could be just as well applied to stationary devices if so desired.

I claim:

1. In a device of the character described, the combination of one or more pivoted bolsters, a dumping body supported thereon and means for letting the said bolster or bolsters into the dumping body, the said bolsters having a pin and zigzag slot connection with the dumping body so arranged that when the dumping body is tilted the pin will be released to jolt the body.

2. In a device of the character described, the combination of one or more pivoted bolsters and a dumping body supported thereon, the said bolsters having a pin and zigzag slot connection with the dumping body so arranged that when the dumping body is tilted the pin will be released to jolt the body.

3. In a device of the character described, the combination of one or more pivoted bolsters, bumpers for limiting the movement thereof, and a dumping body supported thereon, the said bolsters having a pin and zigzag slot connection with the dumping body so arranged that when the dumping body is tilted the pin will be released by one of said bumpers to jolt the body.

4. In a device of the character described, the combination of one or more pivoted bolsters and a dumping body supported thereon, the said bolsters having at each end thereof a pin and zigzag slot connection with the dumping body so arranged that when the dumping body is tilted the pin will be released to jolt the body.

5. In a device of the character described, the combination of one or more pivoted bolsters, bolsters for limiting the movement thereof, and a dumping body supported thereon, the said bolsters having at each end thereof a pin and zigzag slot connection with the dumping body so arranged that when the dumping body is tilted the pin will be released by a bumper to jolt the body.

6. In a device of the character described the combination of a dumping body and mechanism for dumping the same comprising a motor, a shaft extending longitudinally of the dumping body having connections therewith to effect the dumping thereof and a manually operated clutch for connecting the shaft with the motor.

7. In a device of the character described, the combination of a dumping body and mechanism for dumping the same on either

side thereof, comprising a motor, a shaft extending longitudinally of the dumping body on each side thereof having connections therewith to effect the dumping thereof and a manually operated clutch on each side of the dumping body for connecting the shafts with the motor.

8. In a device of the character described, the combination of two dumping bodies and mechanism for dumping the same comprising a motor, a separate shaft extending longitudinally of each of the said bodies and arranged in alinement having connections therewith to effect the dumping of the bodies separately and a manually operated clutch for connecting either of the shafts with the motor.

9. In a device of the character described, the combination of two dumping bodies and mechanism for dumping the same on either side thereof, comprising a motor, a separate shaft extending longitudinally on each side of each of the said bodies and arranged in alinement having connections therewith to effect the dumping of the bodies separately and a manually operated clutch on each side of the dumping body for connecting either of the shafts on one side with the motor.

10. In a device of the character described, the combination of two dumping bodies and mechanism for dumping the same on either side thereof, comprising a motor, a separate shaft extending longitudinally on each side of each of the said bodies and arranged in alinement having connections therewith to effect the dumping of the bodies separately and a manually operated clutch on each side of the dumping body for connecting either of the shafts on one side with the motor, said clutches being provided with interlocking connections to render one clutch inoperative while the other clutch is being operated.

11. In a device of the character described, the combination of two dumping bodies and mechanism for dumping the same on either side thereof, comprising a motor, a separate shaft extending longitudinally on each side of each of the said bodies and arranged in alinement having connections therewith to effect the dumping of the bodies separately and a manually operated clutch on each side of the dumping body for connecting either of the shafts on one side with the motor, said clutches being provided with interlocking connections to retain one clutch in its middle and inoperative position when the other clutch has been moved out of its middle position.

12. In a device of the character described, the combination of two dumping bodies and mechanism for dumping the same on either side thereof, comprising a motor, a separate shaft extending longitudinally on each side of each of the said bodies and arranged in

alinement having connections therewith to effect the dumping of the bodies separately, a clutch on each side of the dumping body for connecting either of the shafts on one side with the motor, a manually operated lever connected with each clutch for operating the same and an interlocking rod extending from each of said levers to the other to render one clutch inoperable while the other clutch is being operated.

13. In a device of the character described, the combination of two dumping bodies and mechanism for dumping the same on either side thereof, comprising a motor, a separate shaft extending longitudinally on each side of each of the said bodies and arranged in alinement having connections therewith to effect the dumping of the bodies separately, a clutch on each side of the dumping body for connecting either of the shafts on one side with the motor, a manually operated lever connected with each clutch for operating the same, and an interlocking rod extending from each of said levers to the other to retain one clutch in its middle and inoperative position when the other clutch has been moved out of its middle position.

14. In a device of the character described, the combination of two dumping bodies and mechanism for dumping the same on either side thereof, comprising a motor, a separate shaft extending longitudinally on each side of each of the said bodies and arranged in alinement having connections therewith to effect the dumping of the bodies separately,

a clutch on each side of the dumping body for connecting either of the shafts on one side with the motor, a manually operated lever connected with each clutch for operating the same and an interlocking rod extending from each of said levers to the other and adapted to operate a spring-pressed pin cooperating with one of said levers to render one clutch inoperable while the other clutch is being operated.

15. In a device of the character described, the combination of two dumping bodies and mechanism for dumping the same on either side thereof, comprising a motor, a separate shaft extending longitudinally on each side of each of the said bodies and arranged in alinement having connections therewith to effect the dumping of the bodies separately, a clutch on each side of the dumping body for connecting either of the shafts on one side with the motor, a manually operated lever connected with each clutch for operating the same, and an interlocking rod extending from each of said levers to the other and adapted to operate a spring-pressed pin cooperating with one of said levers, to retain one clutch in its middle and inoperative position when the other clutch has been moved out of its middle position.

In testimony that I claim the foregoing I have hereunto set my hand.

ALEXANDER ROSS PIPER.

Witnesses:

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BURTON R. DODGE.