

1,063,276.

Patented June 3, 1913.

3 SHEETS-SHEET 1.

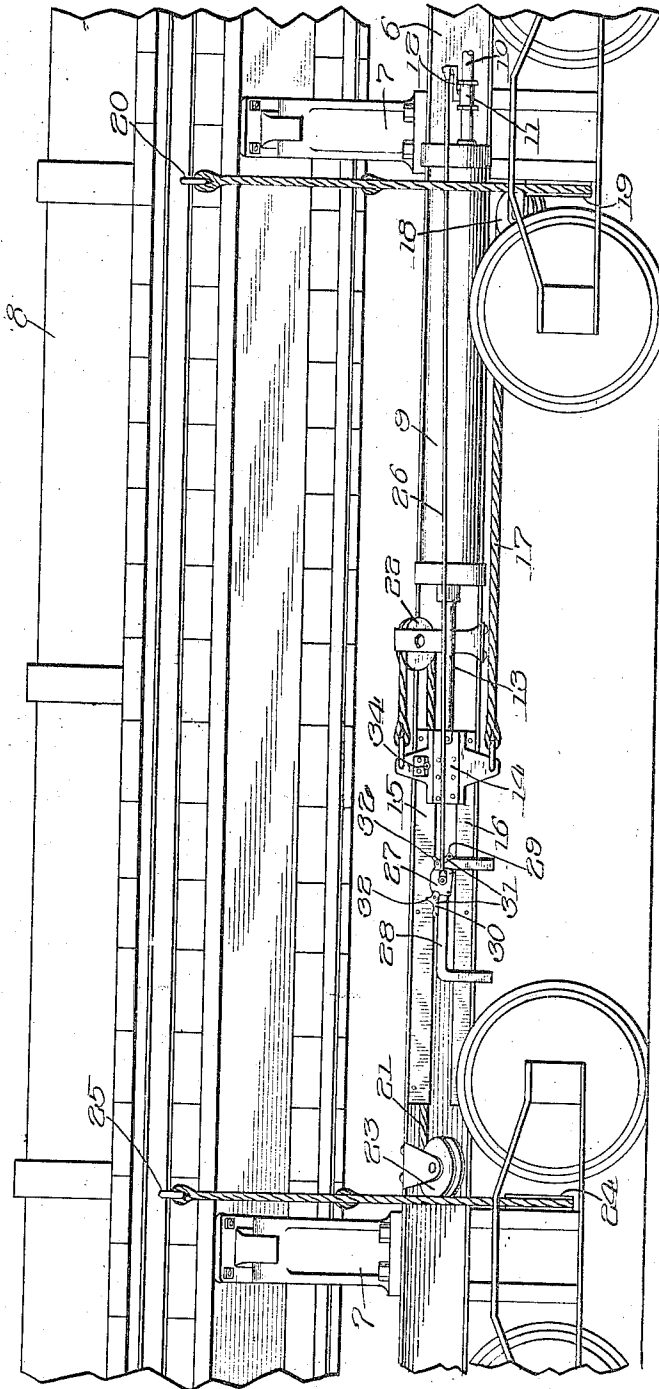


Fig. 1.

Witnesses:
Ed. D. Perry
M. D. Busk

Inventor:
Thomas R. McKnight,
by Bond Adams, Bickel & Jackson,
Attys

T. R. McKNIGHT.

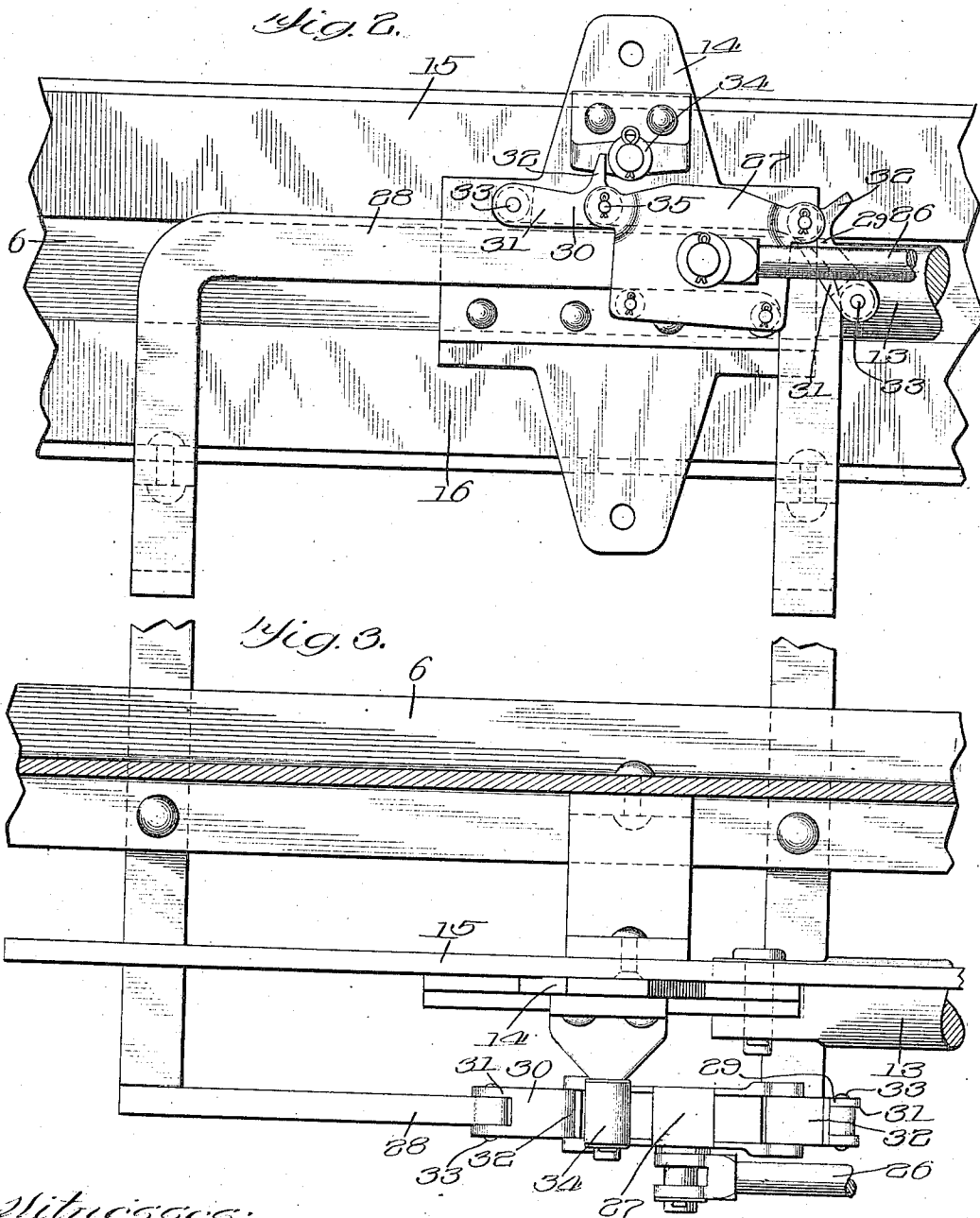
DUMP CAR.

APPLICATION FILED MAR. 17, 1911.

1,063,276.

Patented June 3, 1913.

3 SHEETS—SHEET 2.



Witnesses:

Edw. P. Kemp

M. S. Bush

Inventor:

Thomas R. McKnight,

By *Benjamin Adams* *Richard J. Johnson.*

Atty.

T. R. McKNIGHT.
DUMP CAR.
APPLICATION FILED MAR. 17, 1911.

1,063,276.

Patented June 3, 1913.

3 SHEETS—SHEET 3.

Fig. 4.

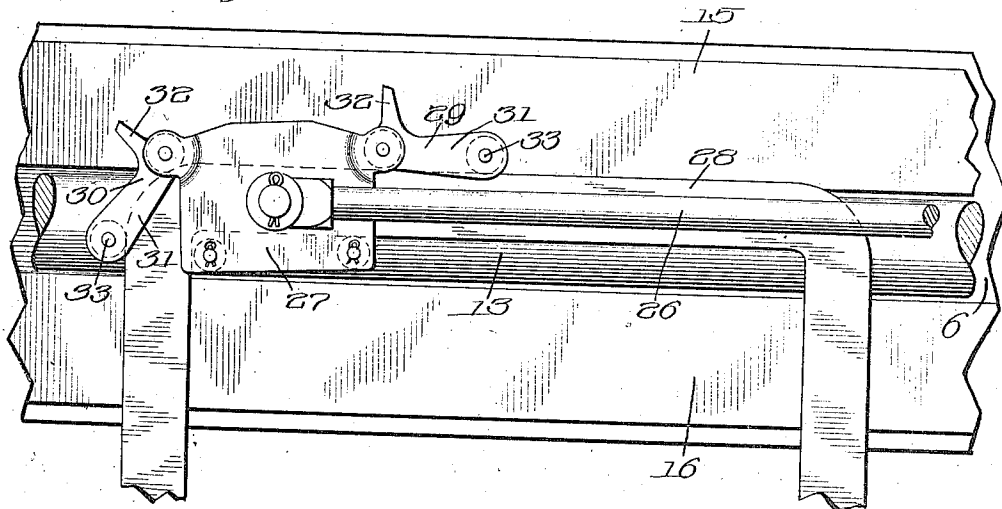
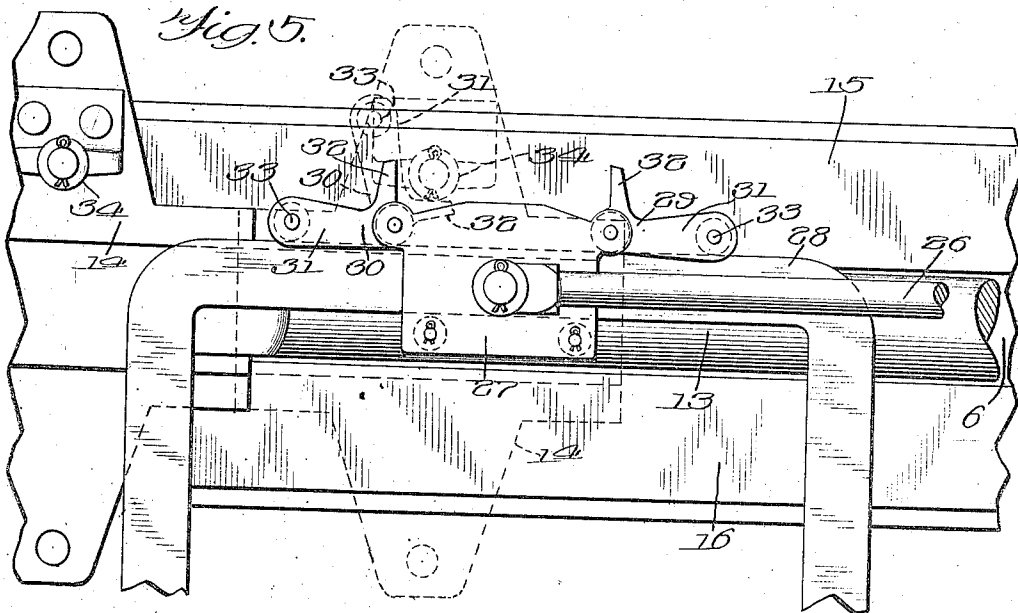


Fig. 5.



Witnesses:

W. R. Terry

M. H. Bush

Inventor:

Thomas R. McKnight,

by Bond, Hunsicker & Johnson,

Attys.

UNITED STATES PATENT OFFICE.

THOMAS R. McKNIGHT, OF AURORA, ILLINOIS, ASSIGNOR TO WESTERN WHEELED
SCRAPER COMPANY, OF AURORA, ILLINOIS, A CORPORATION OF ILLINOIS.

DUMP-CAR.

1,063,276.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed March 17, 1911. Serial No. 615,062.

To all whom it may concern:

Be it known that I, THOMAS R. McKNIGHT, a citizen of the United States, residing at Aurora, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Dump-Cars, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to dump cars, and has more especially to do with such cars of the type shown and described in Letters Patent of the United States, No. 920,616, granted to me May 4, 1909, in which the car bed or box is mounted to rock transversely so as to discharge its load at one side of the train. Usually such cars are arranged to dump at either side of the train, but this is not essential to my present invention. In the construction described in my said patent the lateral tilting of the car bed is effected by compressed air operating in cylinders carried by the car and supplied with air from train-pipes controlled by an engineer's valve in the cab, the arrangement being such that by admitting air to one of the cylinders one side of the car bed is pulled down so as to tilt it to discharge its load, and by admitting air to the other cylinder, which operates mechanism connected with the opposite side of the car, the car bed is righted or restored to its normal or operative position. The compressed air cylinders referred to are provided with pistons and piston-rods, by the reciprocation of which cables are operated which run over certain pulleys and are connected to the sides of the car in such manner that movement of the piston in one direction pulls down on one side of the car while reverse movement of the piston pays out the cables and permits the car to be righted by the action of the piston connected with the other side of the car. The admission of compressed air to either cylinder from its train-pipe is controlled by a valve which is normally open but is automatically closed to shut off the supply of compressed air when the car bed has been dumped, and is again automatically opened when the car bed is restored to its normal position, or during the righting movement. This construction and operation are fully described in my said patent.

My present invention resides more particularly in improved means for opening and

closing the inlet valve so that such mechanism will be made practically "fool proof" and is bound to operate correctly without attention on the part of the operator regardless of the direction in which the piston moves. I accomplish this object as illustrated in the drawings and as hereinafter described.

What I regard as new is set forth in the claims.

In the accompanying drawings,—Figure 1 is a partial side elevation of a dump-car embodying my improvements; Fig. 2 is an enlarged detail of a part of the valve-operating mechanism; Fig. 3 is a plan view of the parts shown in Fig. 2, some parts being in section; Fig. 4 is a view similar to that shown in Fig. 2, showing a different position thereof; and Fig. 5 is a similar view illustrating the action of the mechanism shown.

Referring to the drawings,—6 indicates a part of the draft-rigging, which carries standards 7 which pivotally support the car bed 8 so that it may rock laterally.

9 indicates one of the cylinders by which the car bed is tilted to dump it, or to right it, as the case may be. Two of such cylinders are employed for actuating mechanism connected with the opposite sides of the car, as described in my said patent.

10 indicates a pipe leading to the cylinder 9 from a suitable source of compressed air supply, as a train-pipe equipped with an engineer's valve by which compressed air may be supplied to or exhausted from said train-pipe.

11 indicates an inlet valve for controlling the admission of compressed air to the cylinder 9 from the train-pipe. Said valve is provided with a lever or crank 12, by the operation of which the valve is opened or closed.

13 indicates a piston-rod connected with a piston moving in the cylinder 9, said piston-rod extending longitudinally of the car and being connected with a slide-block 14 moving between suitable guides 15—16.

17 indicates a cable connected with the slide-block 14 and extending around pulleys 18—19 to the point of its connection with one side of the car at 20. 21 indicates another cable also connected with the slide-block 14 and extending around pulleys 22, 23—24 to the point of its connection with

the side of the car at 25, as shown in Fig. 1. The several pulleys are mounted in suitable fixed supports and the arrangement is such that when the slide-block 14 moves to the left, as illustrated in Fig. 1, the cables 17—21 are taken up and the side of the car to which they are connected is pulled down.

The illustration in Fig. 1 shows the car bed as being tilted away from the observer to dump at the opposite side of the train, and consequently movement of the slide-block 14 to the left will operate to restore the car bed to its normal position. Further movement of the slide-block in the same direction will tilt the car to dump the load on the near side of the train. Movement of the piston 13 to the left is effected by admitting compressed air to the cylinder 9 through valve 11, and this is accomplished by the engineer who admits air to the train-pipe connected with the pipe 10, the valve 11 being normally open.

When the car bed is being righted, it is stopped when it reaches its normal or horizontal position by fastening the usual stay-chains on the dumping side of the car, and after it has been righted the stay-chains on both sides of the car are secured. It will be understood further that when the car bed is to be dumped the stay-chains at the side opposite the dumping side are released so as to leave the car bed free to tilt in the proper direction.

When the car bed has been dumped, it will be apparent that as it is righted by admission of compressed air to the cylinder connected with the opposite side thereof, it is necessary to shut off the supply of compressed air from the dumping cylinder in order that the air in the cylinder connected with the opposite side may be effective to right it, and this is accomplished automatically in the construction shown by mechanism which will now be described.

26 indicates a rod connected at one end with the lever 12 and at the other end with a movable member in the form of a slide-block 27 mounted on an inverted U-shaped guide 28 which is suitably secured in position adjacent to the path of the piston-rod 13, as best shown in Fig. 3. Said slide-block 27 is adapted to move upon said guide 28 from one end thereof to the other, as illustrated in Figs. 2 and 4, and is provided at its opposite end portions with oppositely-disposed pivoted members or stops 29—30 in the form of bell-crank levers, each having an arm 31 which normally extends horizontally and an arm 32 which normally extends vertically,—the arm 31 having a roller 33 which runs upon the guide 28. The position of the stops 29—30 when the slide-block 27 occupies an intermediate position upon the guide 28 is shown in Fig. 5, and the position of the several parts when the slide-block 27

is at either end of its movement is shown in Figs. 2 and 4, respectively. The fingers 32 of the stops 29—30 project up into the path of a roller 34 carried by the slide-blocks 14, as best shown in Figs. 2 and 3, the function of said stops being, when properly engaged by said roller 34, to cause the slide-block 27 to move with the piston 13 in one direction or the other so as to operate the valve 11, but to be ineffective when improperly engaged by said roller. For example, assuming that the parts are in the position shown in Fig. 2 and that the piston 13 is moving to the left, the finger 32 of the stop 30 at that time projects up into the path of the roller 34 and consequently movement of the piston 13 and slide-block 14 will cause the slide-block 27 to move to the left also, and will consequently close the valve 11. The adjustment of the parts is such that the valve 11 will be completely closed when the stop 30 reaches the left-hand end of the guide 28, when further movement of the piston in the same direction will be ineffective to move the slide-block 27 further because said stop 30 will then rock about its pivot 35 into the position shown in Fig. 4, thereby causing its finger 32 to move out of engagement with the roller 34. At this time the stop 29 will occupy the position shown in Fig. 4 and its finger 32 will be in position to engage the roller 34 upon reverse movement of the piston, and will act to move the rod 26 and valve lever 12 in the opposite direction and so open the valve; thus movement of the piston in either direction operates automatically to appropriately open or close the valve 11. It will be observed that the construction of the valve-operating mechanism is such that it is bound to operate correctly even if the slide-block 27 is moved by hand out of the position which it should properly occupy, because the member or stop 29 is capable of being operatively engaged by the roller 34 of the slide block 14 by movement of said roller in one direction only, and the member or stop 30 is capable of being operatively engaged by said roller when the latter moves in the opposite direction only. For example, as illustrated in dotted lines in Fig. 5, if the slide-block 27 should be moved by hand to an intermediate position upon the guide 28 in advance of the slide-block 14 so that movement of the slide-block 14 to the right would engage the finger 32 of the stop 30 on the wrong side, it would do no harm, as movement of the slide-block 14 would simply rock the stop 30 in the manner shown in dotted lines in Fig. 5, and so pass over it without damage and without moving the slide-block 27 until the roller 34 should come in contact with the arm 32 of stop 29. This feature of providing a safe automatic valve-operating device is the improvement which forms the subject-

matter of this application. So far as I am aware, it is broadly new in a single-acting, as well as a double-acting device, and the claims hereinafter made are therefore to be construed accordingly.

That which I claim as my invention, and desire to secure by Letters Patent, is,—

1. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of means operatively engaged by said piston-operated mechanism when the same moves in one direction for moving said valve in one direction, said piston-operated mechanism being arranged to pass said valve-moving means without operation thereof when moving in the other direction.

2. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a movable member, means connecting said member with said valve for operating the same, and means pivotally carried by said member and intermittently coacting with said piston-operated mechanism for operating the valve.

3. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a reciprocating member, means connecting said member with said valve for operating the same, and means pivotally carried by said member and intermittently coacting with said piston-operated mechanism for operating the valve.

4. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of valve-operating mechanism connected with said valve and actuated by said piston-operated mechanism when the latter is moved in one direction, said piston-operated mechanism being movable independently of said valve-operating mechanism in the opposite direction.

5. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a reciprocating member connected with said valve, and a pivoted stop carried by said member and adapted to be engaged by said piston-operated mechanism, said stop having means for limiting the extent to which it may rock in one direction.

6. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the

combination with piston-operated mechanism for rocking the car bed, of a reciprocating member connected with said valve, and a pivoted stop carried by said member and adapted to be engaged by said piston-operated mechanism for moving said member, said stop comprising an arm arranged at an angle thereto, and a guide cooperating with said arm for controlling the position of said stop.

7. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a reciprocating member connected with said valve, a stop in the form of a bell-crank lever pivotally mounted on said member and adapted to be engaged by said piston-operated mechanism for moving said member, and a guide cooperating with one of the arms of said stop for limiting the movement thereof.

8. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a reciprocating member connected with said valve, a stop in the form of a bell-crank lever pivotally mounted on said member and adapted to be engaged by said piston-operated mechanism for moving said member, and a U-shaped guide cooperating with said stop for controlling the position thereof.

9. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a movable member connected with said valve for operating the same, and oppositely-acting stops carried by said member and coacting with said piston-operated mechanism when the same is moved in one direction or the other for opening or closing said valve.

10. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a movable member connected with said valve for operating the same, and oppositely-disposed stops pivotally mounted upon said member to swing in opposite directions, and coacting with said piston-operated mechanism when moved in one direction or the other for opening or closing said valve.

11. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a movable member connected with said valve for operating the same, and oppositely-disposed bell-crank levers pivotally mounted upon

said member to swing in opposite directions, and coacting with said piston-operated mechanism when moved in one direction or the other for opening or closing said valve.

5 12. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a movable member connected with said valve for operating the same, oppositely-disposed bell-crank levers pivotally mounted upon said member to swing in opposite directions, and coacting with said piston-operated mechanism when moved in one direction or the other for opening or closing said valve, and a guide for controlling the movement of said bell-crank levers.

13. In a dump-car having a compressed-air cylinder, a valve for admitting air thereto, and a piston moving in said cylinder, the combination with piston-operated mechanism for rocking the car bed, of a movable member connected with said valve for operating the same, oppositely-disposed bell-crank levers pivotally mounted upon said member to swing in opposite directions, and coacting with said piston-operated mechanism when moved in one direction or the other for opening or closing said valve, and an inverted U-shaped guide for controlling the movement of said bell-crank levers.

14. In a dump-car, the combination with fluid-pressure-operated mechanism for rocking the car bed, and a valve for controlling the operation thereof, of valve-operating means comprising a member capable of being operatively engaged by said fluid-pressure-operated mechanism when the latter moves in one direction, said member being incapable of being operatively engaged by said fluid-pressure-operated mechanism when the latter moves in the opposite direction.

15. In a dump-car, the combination with fluid-pressure-operated mechanism for rocking the car bed, and a valve for controlling

the operation thereof; of valve-operating means comprising a member capable of being operatively engaged by said fluid-pressure-operated mechanism when the latter moves in one direction and being automatically disengaged therefrom under excessive movement of said fluid-pressure-operated mechanism in the same direction, said member being incapable of being operatively engaged by said fluid-pressure-operated mechanism when the latter moves in the opposite direction.

16. In a dump-car, the combination with fluid-pressure-operated mechanism for rocking the car bed, and a valve for controlling the operation thereof, of a valve-operating device comprising a plurality of members, one of said members being capable of being operatively engaged by said fluid-pressure-operated mechanism by movement thereof in one direction only, and the other of said members being capable of being operatively engaged by said fluid-pressure-operated mechanism by movement thereof in the opposite direction only.

17. In a dump-car, the combination with fluid-pressure-operated mechanism for rocking the car bed, and a valve for controlling the operation thereof, of a valve-operating device comprising a plurality of members, one of said members being capable of being operatively engaged by said fluid-pressure-operated mechanism by movement thereof in one direction only and being inoperative under excessive movement in the same direction of the fluid-pressure-operated mechanism, and the other of said members being capable of being operatively engaged by said fluid-pressure-operated mechanism by movement thereof in the opposite direction only and being inoperative under excessive movement in such direction of the fluid-pressure-operated mechanism.

THOMAS R. McKNIGHT.

Witnesses:

H. D. HAMPER,
R. L. RUBLE.