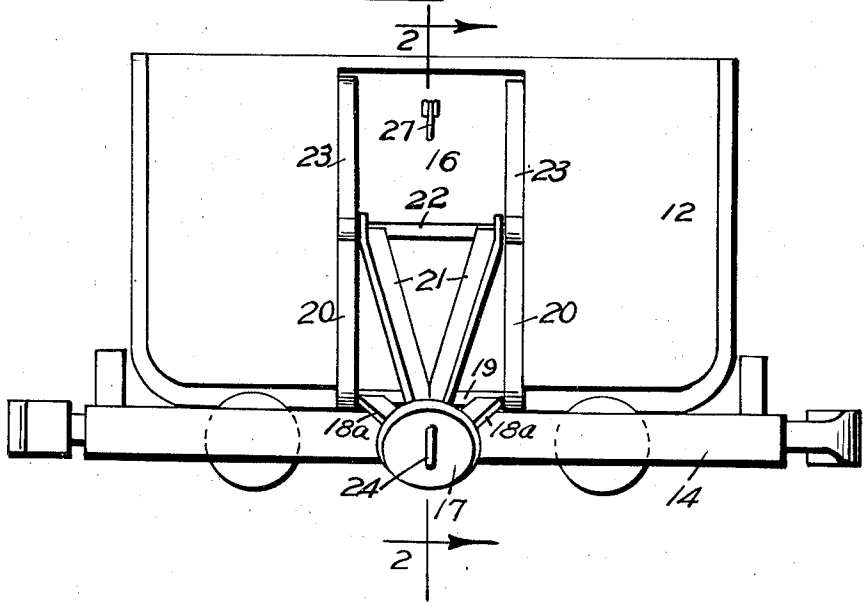
Aug. 12, 1941. A. V. CARD 2,251,981

DUMP CAR

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Fig. 1.



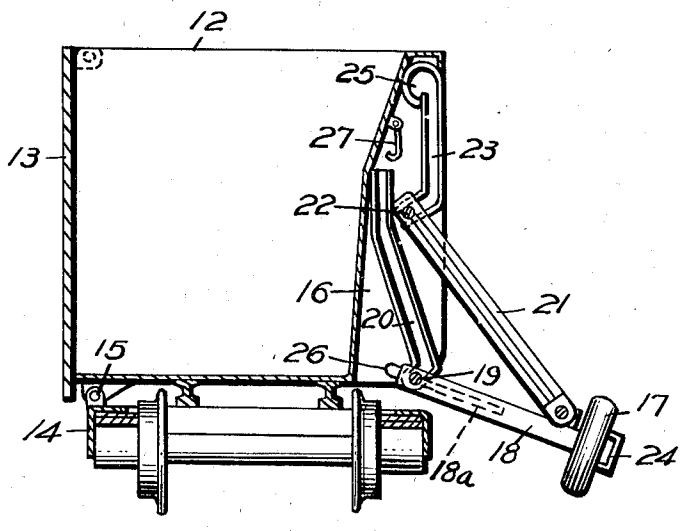


Fig. 2.

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DUMP CAR

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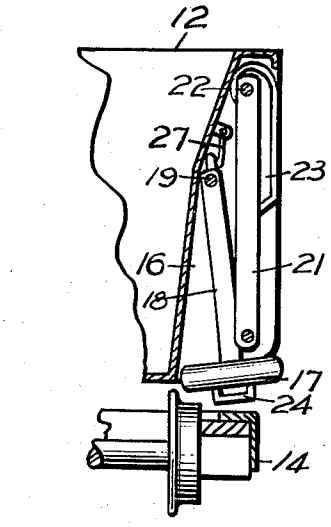


Fig. 3.

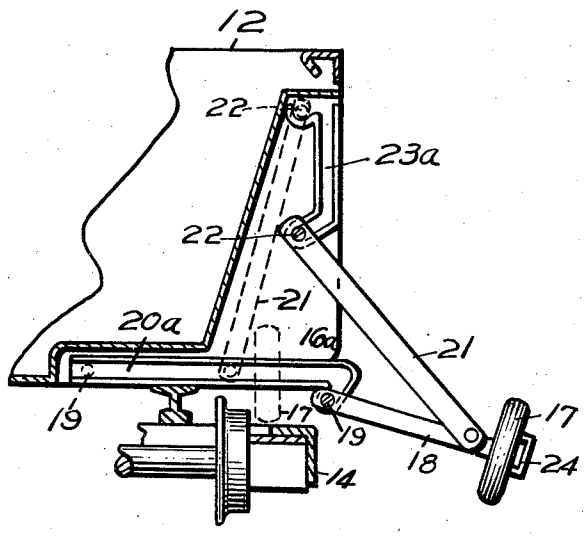


Fig. 4.

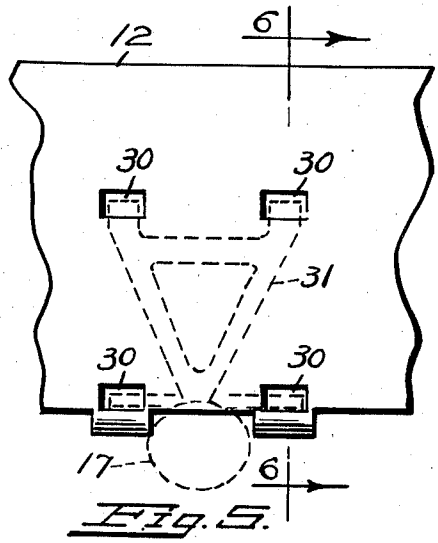


Fig. 5.

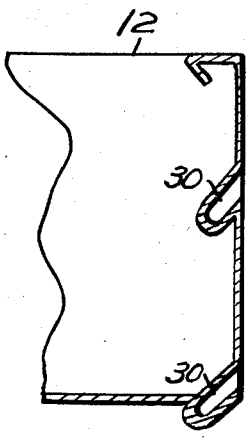


Fig. 6.

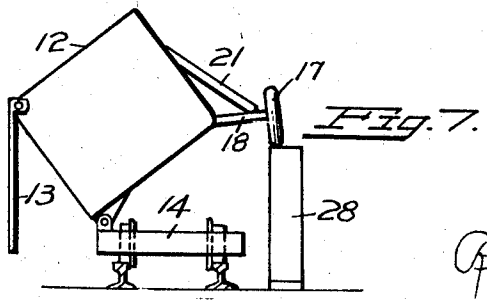


Fig. 7.

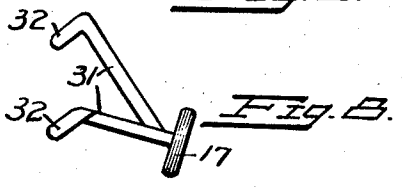


Fig. 8.

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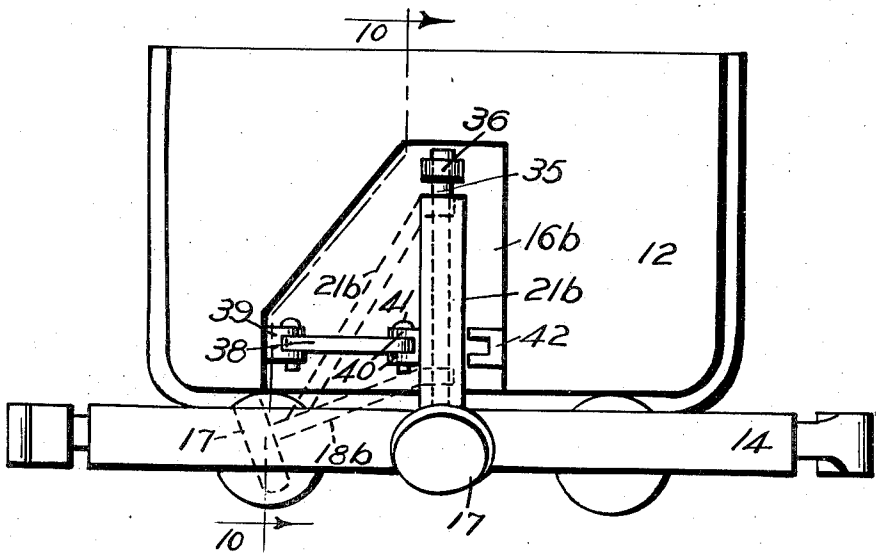
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Aug. 12, 1941. A. V. CARD 2,251,981

DUMP CAR

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Fig. 9.



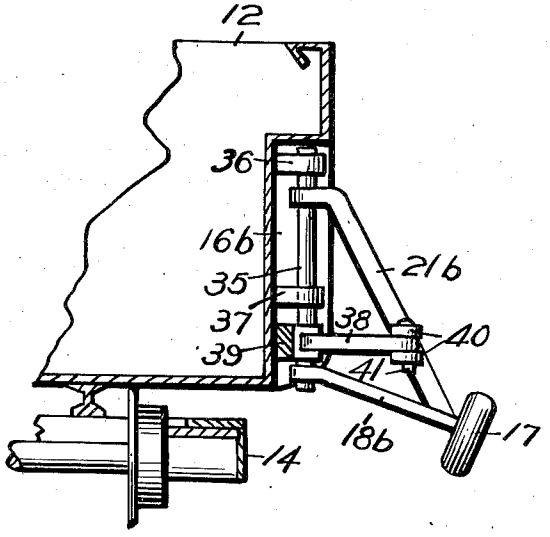


Fig. 10.

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Patented Aug. 12, 1941 2,251,981

UNITED STATES PATENT OFFICE

2,251,981

DUMP CAR

Arthur V. Card, Denver, Colo., assignor to The C. S. Card Iron Works Company, Denver, Colo., a corporation of Colorado

Application August 15, 1939, Serial No. 290,179

16 Claims. (Cl. 105—274)

This invention relates to improvements in railway dump cars.

The Granby type railway dump car is in common use, particularly in the mining industry. The fundamental components of the Granby type dump car are a wheeled truck adapted to run along the rails of a railroad, a body hinged or pivoted along a side thereof to the wheeled truck, a hinged gate on the body at the dumping side, and a dump roller journalled on an arm projecting from the body and attached thereto opposite the dump gate. The dump roller is adapted to ride up an inclined track adjacent the rails of the railroad, thus causing the hinged dump body to tip and discharge its load through the dump gate. The inclined track ordinarily leads to a length of track that is elevated with reference to the rails upon which the car travels so that the body is in its tipped-up dumping position for an appreciable length of time while the dump roller traverses the elevated track. Cars of this Granby type may be dumped while they are moving along at four or five miles an hour, thus spreading their load along the dump as they travel.

An objection to the Granby type dump car is that the dump roller ordinarily projects on a rigid arm, from the side of the car body, thus creating a continuous hazard that it might strike something, such as workmen, other equipment, the walls of a mine tunnel, etc.

It will be understood that in mining work, dump cars usually are required to operate where clearances are limited. In a mine tunnel, for instance, the walls of the tunnel may provide only a minimum of clearance for the ore cars.

It is highly desirable in designing and building cars for use in or adjacent mines, to have as great a capacity in the car body as possible, with the lowest possible external measurements, and minimum clearance requirements.

Therefore, it is a principal object of this invention to provide in a Granby type dump car, a dump roller that may be extended to perform the dumping operation and retracted at all other times so that the car requires no greater clearance space than a non-dumping car would require.

Another object is the provision of a retractable dump roller for a dump car, that readily may be extended or retracted, and which will remain in its retracted position securely.

A still further object is to provide in a Granby type dump car, a dump roller that may quickly be attached or completely removed from the car body, as the occasion may require.

Other objects and advantages reside in details of design and construction which will be more fully disclosed in the following description and in the drawings wherein like parts have been similarly designated and in which:

Figure 1 is a general side elevation of a dump car embodying the present inventive concept;

Figure 2 is a transverse sectional view taken along the line 2—2 of Figure 1;

Figure 3 is a fragmentary sectional view showing the dump roller of Figures 1 and 2 in its retracted position;

Figure 4 is a fragmentary sectional view illustrating a modified form of the present inventive concept;

Figure 5 is a fragmentary side elevation of a car showing a further modified form of this invention;

Figure 6 is a fragmentary sectional view taken along the line 6—6 of Figure 5.

Figure 7 is a diagrammatic end elevation of a dump car in its dumping position;

Figure 8 illustrates an attachable dump wheel that is adapted to be attached to a dump car made according to Figures 5 and 6, but drawn on a smaller scale than said figures;

Figure 9 is a side elevation of another form of the present invention; and

Figure 10 is a fragmentary sectional view taken along the line 10—10 of Figure 9.

In order to disclose and record operable reductions to practice of the several forms of the present inventive concept, reference will be had to the accompanying drawings. However, it is to be understood that the examples herewith illustrated and described are not intended to express or imply any limitation to this invention, the scope of which is measured by the appended claims.

Referring first to Figures 1 and 2, reference character 12 denotes a railway dump car body, having a hinged dump gate 13. The body 12 is hinged to a wheeled truck 14 at 15, and is provided with a recess 16 in a side thereof opposite the dump gate 13. A dump roller 17 is journalled on a retractable arm 18 having reinforcements 18a. The arm 18—18a is mounted upon a shaft 19, the ends of which are carried in grooves or guide-ways 20 that are positioned in the recess 16 at opposite sides thereof. The arm 18 is further supported by an angle brace 21 which is pivoted to the arm 18 at its lower end

and which is carried upon a shaft 22 at its upper end. The extremities of the shaft 22 are carried in grooves or guide-ways 23 which are also positioned in the recess 16 at opposite sides thereof. The arm 18 and the angle brace 21 pivoted thereto, form a folding retractable mechanism for holding the dump roller 17. The extremities of the shafts 19 and 22 provide guide-way followers.

A handle 24 is placed on roller 17 so that an operator may readily handle the roller 17 and its associated retractable supporting mechanism. At the upper end of the grooves or guide-ways 23 are notches 25 in which the shaft 22 is placed when the roller is retracted, and a clip 26 on the end of the arm 18 is positioned to be engaged by a hook 27 in the recess 16 to further secure the roller 17 and its supporting mechanism in their retracted position.

It readily will be seen that an operator may grasp the handle 24 on the roller 17 to partially take the weight off of its supporting members, after which the shafts 19 and 22 may be moved upwardly along the grooves 20 and 23 respectively, to their retracted position as illustrated in Figure 3. In this position, the roller 17 and all of its supporting structure are moved within the flush clearance requirement of the side of the dump body 12.

Cars made according to this invention may be operated the same as non-dumping cars when the dump roller 17 and its supporting mechanism are retracted. After the cars are loaded, and as they approach the dump, an operator may quickly extend the roller to its operative position as illustrated in Figures 1 and 2. Due to the particular angular relationship of the supports 18 and 21 and the direction of the moments of force exerted to tip or rotate the car body 12 about its pivotal axis 15, with relation to the angle of the lower portions of the grooves or guide-ways 20 and 23, the roller is effective for tipping the body 12 as it rides up the inclined track 28, as diagrammatically illustrated in Figure 7. The contour of the grooves and guide-ways 20 and 23 is such that the roller 17 and its associated mechanism easily may be placed in their retracted position and as readily extended when desired.

Figure 4 illustrates a modified arrangement of the grooves or guide-ways along which the retractable supporting mechanism may be moved. The shaft 22 which carries the upper end of the support member 21 is carried in and movable along grooves or guide-ways 23*a* that are quite similar to the grooves or guide-ways 23. The arm 18 upon which the roller 17 is journalled, is carried upon the shaft 19 which, in this modified form, is movable along the grooves or guide-ways 20*a* that extend horizontally instead of vertically.

When the roller 17 and its supporting mechanism 18—19—21—22 are retracted in the modified arrangement shown in Figure 4, they are positioned as shown in the dotted lines.

In the forms of this invention shown in Figures 1, 2, 3 and 4, it will be noted that recesses 16 and 16*a* are provided to house the roller and its supporting members in their retracted position. Obviously, these housings subtract from the cubic capacity of the car body 12.

Under some circumstances, it may be advantageous to provide a plurality of inset notches 30, Figure 5, in the side of the car body 12 which subtract very little from the cubic capacity of the car. When notches 30 are provided, the dump roller 17 may be journalled upon a supporting structure 31, Figure 8, which is provided with hook-like projections 32 so spaced that they fit into the notches 30. The angular relationship of the notches 30, the support 31 and the hooks 32, is, as explained above, such that the moments of force exerted on the roller 17 to tip the car body, do not disarrange or move the roller with reference to said car body, but impart upward angular movement to the car body through the intermediary of the support 31 and the hooks 32.

Obviously, the support 31 quickly and easily may be attached to the car body 12 through the intermediary of the hook-like projections 32 being fitted into the notches 30. The support 31 and the roller 17 are indicated in dotted lines in Figure 5, superimposed upon the fragmentary elevation of the car body 12, as it would appear in its operating position. In this form of the invention, the roller 31 is attached to the car body when the load is to be dumped and may readily be removed thereafter to eliminate the objectionable projection which is common fault in ordinary Granby type dump cars.

Furthermore, according to the form of the invention illustrated in Figures 5, 6, and 8, one roller assembly as illustrated in Figure 8, may be interchangeably mounted upon any number of cars that are provided with coordinated notches 30.

A still further advantage in this latter form of the invention is that when the cars are in use other than the actual dumping operation, the weight of the dump roller and its associated support is entirely removed, which is an obvious advantage well known to anyone skilled in this art.

In the form of the invention shown in Figures 9 and 10, a recess 16*b* is provided in the side of the dump body 12. The dump roller 17 is journalled upon an arm 18*b*, which is further supported by arm 21*b* which is attached in angular relationship thereto.

The arms 18*b* and 21*b* are mounted for limited rotary or angular movement upon a vertical pin or shaft 35, which in turn is rotatably mounted in bearings 36 and 37. The arms 18*b* and 21*b* may be mounted to rotate upon the pin or shaft 35, or said member 35 may be rotatable in its supports 36 and 37, in which case the arms 18*b* and 21*b* may be mounted to rotate conjointly with the shaft 35.

A thrust brace 38 is pivotally mounted in a bifurcated lug 39 and may be selectively attached to another bifurcated lug 40 on the arm 21*b*, by means of a removable pin 41.

It will readily be seen that when the mechanism 18*b*—21*b* upon which the dump roller 17 is journalled, is in an extended position as illustrated in Figures 9 and 10, the thrust brace 38 securely holds the assembly in such position for performing the dumping function.

When the dump roller 17 is not in use, the pin 41 may be withdrawn from the bifurcated lug 40 and the thrust brace 38, thus releasing said brace from its engagement with the arm 21*b*, whereupon the roller 17 and its supporting mechanism may be retracted to the position shown in dotted lines in Figure 9.

The retracting operation is merely the swinging of the roller 17 and its supporting arm 18*b*—21*b* to a position adjacent the side of the dump body 12. In this retracted position, most of the mechanism 18*b*—21*b* is in the recess 16*b*

and the roller 17 is positioned immediately therebelow.

In order to hold the retractable assembly in its retracted position, the member 38 may be brought across the recess 16b on the outside of the roller support 21b and engaged in another bifurcated lug 42 in the edge of the recess. The part 38 may be held in engagement with the bifurcated lug 42 by inserting the pin 41 through said lug and member 38. In this position, the retractable mechanism is securely held from accidentally swinging outwardly from the car body. When the roller 17 is again to be extended for use, the thrust brace 38 is again positioned in the bifurcated lug 40 on the arm 21b and held there by the pin 41.

Thus, the stated objects of this invention are successfully accomplished, in that means are provided for extending and retracting a dump roller on a dump car. Furthermore, means are provided for readily and interchangeably attaching a roller to dump cars. All of the simplified advantages of the Granby type dump car are obtained in the present invention and the above enumerated advantages are added.

While this specification discloses preferred means for reducing the present invention to practice and a preferred embodiment of the invention, changes may occur to those skilled in the art and may be made within the scope of the appended claims, without departing from this inventive concept.

What I claim and desire to secure by Letters Patent is:

1. The combination with a tiltable dump car body, of a normally retractable mechanism at times adapted to project laterally therefrom, a dump roller journalled on said mechanism, and means on the car body disposed to engage and to hold said mechanism in a projecting position during dumping.

2. The combination with a tiltable dump car body, of a normally retractable folding mechanism at times adapted to project laterally therefrom, a dump roller journalled on said mechanism, and means on the car body disposed to engage and to hold said mechanism in a projecting position during dumping.

3. In dump car construction, the improvement which comprises a tiltable dump body having a plurality of downwardly and inwardly inclined undercut notches in a side thereof, an arm having notch-engaging portions removably held on the body in the notches, and a dump roller journalled on the arm.

4. The combination with a tiltable dump car body, of a normally retractable mechanism at times adapted to project laterally therefrom, a dump roller journalled on said mechanism, means on the car body disposed to engage and to hold said mechanism in a projecting position during dumping and means for holding the mechanism in its retracted position when not being used for dumping.

5. The combination with a tiltable dump car body, of a normally retractable folding mechanism at times adapted to project laterally therefrom, a dump roller journalled on said mechanism, means on the car body disposed to engage and to hold said mechanism in a projecting position during dumping and means for holding the mechanism in its retracted position when not being used for dumping.

6. In a dump car having a wheeled truck, the improvement which comprises a dump body hinged to the truck and having a recess in a side thereof, guide-ways positioned in the recess and terminating in downwardly and inwardly inclined portions, normally retractable projecting mechanism having guide-way followers slidably supported on the body by said guide-ways, and a dump roller journalled on said mechanism.

7. In a dump car having a wheeled truck, the improvement which comprises a dump body hinged to the truck and having a recess in a side thereof, guide-ways positioned in the recess and terminating in downwardly and inwardly inclined portions, normally retractable projecting mechanism slidably supported on the body by said guide-ways, said mechanism including an arm and a brace pivoted thereto, means on said arm and brace slidably engaging said guideways, and a dump roller journalled on said mechanism.

8. In a dump car having a wheeled truck, the improvement which comprises a dump body hinged to the truck and having a recess in a side thereof, guide-ways positioned in the recess and terminating in downwardly and inwardly inclined portions, normally retractable projecting mechanism slidably supported on the body by said guide-ways, said mechanism including an arm having a guide-way follower, and a brace pivoted thereto, said brace also having a guide-way follower, and a dump roller journalled on said mechanism.

9. In a dump car whaving a wheeled truck, the improvement which comprises a dump body hinged to the truck and having a recess in a side thereof, vertically ranging guide-ways having lower end portions inwardly inclined with reference to other portions thereof and positioned in said recess, projecting mechanism retractably held on said body through the intermediary of said guide-ways, a dump roller journalled on the mechanism, and means on said mechanism cooperating with said guideways for holding said mechanism in dumping position.

10. In a dump car having a wheeled truck, the improvement which comprises a dump body hinged to the truck and having a recess in a side thereof, vertically ranging guide-ways having lower end portions inwardly inclined with reference to other portions thereof and positioned in said recess, projecting mechanism having guide-way followers, retractably held on said body through the intermediary of said guide-ways and followers, and a dump roller journalled on the mechanism.

11. In a dump car having a wheeled truck, the improvement which comprises a dump body hinged to the truck and having a recess in a side thereof, vertically ranging guide-ways having lower end portions angularly inclined inwardly with reference to other portions thereof and positioned in said recess, horizontally ranging guide-ways on the body having outer end portions downwardly and inwardly inclined with reference to other portions thereof, projecting mechanism having guide-way followers, retractably held on said body through the intermediary of said guide-ways and followers, and a dump roller journalled on the mechanism.

12. In a dump car having a wheeled truck, the improvement which comprises a dump body hinged to the truck and having a recess in a side thereof, vertically ranging guide-ways having lower end portions inwardly inclined with reference to other portions thereof and positioned in said recess, projecting mechanism retractably held on said body through the intermediary of

said guide-ways, a dump roller journalled on the mechanism, and means for at times holding the mechanism in a retracted position.

13. In a dump car having a wheeled truck, the improvement which comprises a dump body hinged to the truck and having a recess in a side thereof, vertically ranging guide-ways having lower end portions inwardly inclined with reference to other portions thereof and positioned in said recess, projecting folding mechanism retractably held on said body through the intermediary of said guide-ways, and a dump roller journalled on the mechanism.

14. In a dump car having a wheeled truck, the improvement which comprises a dump body hinged to the truck and having a recess in a side thereof, vertically ranging guide-ways having lower end portions inwardly inclined with reference to other portions thereof and positioned in said recess, projecting mechanism inclusive of an arm, a brace pivotally attached thereto, and guide-way followers on said arm and brace, retractably held on said body through the intermediary of said guide-ways and followers, and a dump roller journalled on the mechanism.

15. In a dump car having a wheeled truck and a dump body hinged to said truck, the improvement which comprises inwardly and downwardly inclined vertically spaced recesses on the car body, a relatively and normally movable arm projecting from said car body, means on the arm adapted by its size and shape to cooperate with said recess to hold the arm rigidly in its projected position during dumping, and a roller on the outer extremity of the projecting arm.

16. The combination with a tiltable dump car body, of a normally and relatively movable arm adapted to be securely held thereon during dumping and projecting therefrom, a dump roller journalled adjacent the outer end of said arm, an inwardly and downwardly inclined recess on the car body above the arm, and means on said arm adapted by its size and shape to enter said recess and to cooperate therewith to hold the arm rigidly in a projecting position during dumping whereby the car body will be tilted.

ARTHUR V. CARD.