June 10, 1924. 1,497,348

F. J. REICHMANN

LOAD CARRYING AND DUMPING VEHICLE

Filed July 25, 1921 4 Sheets-Sheet 1

Fig. 1.

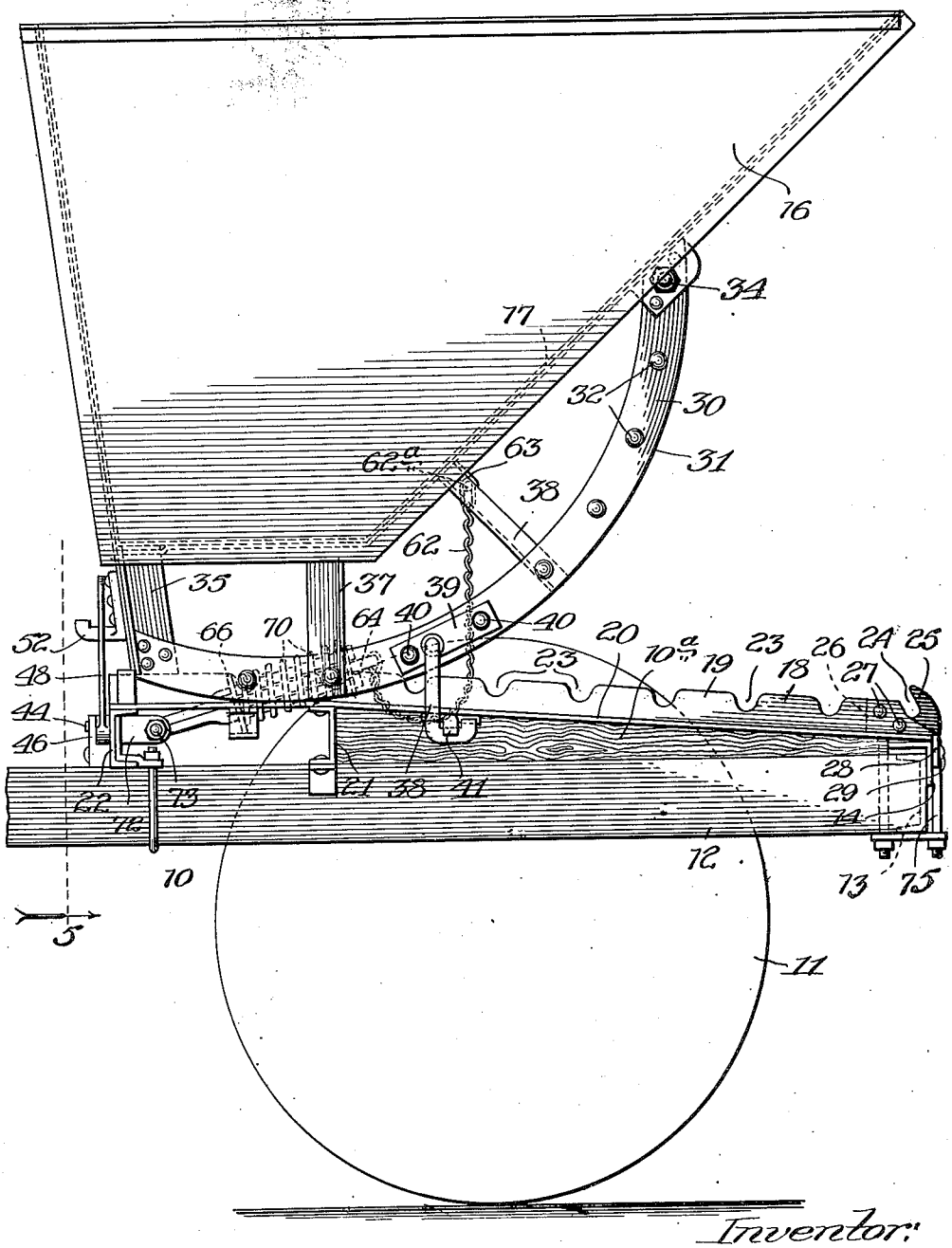

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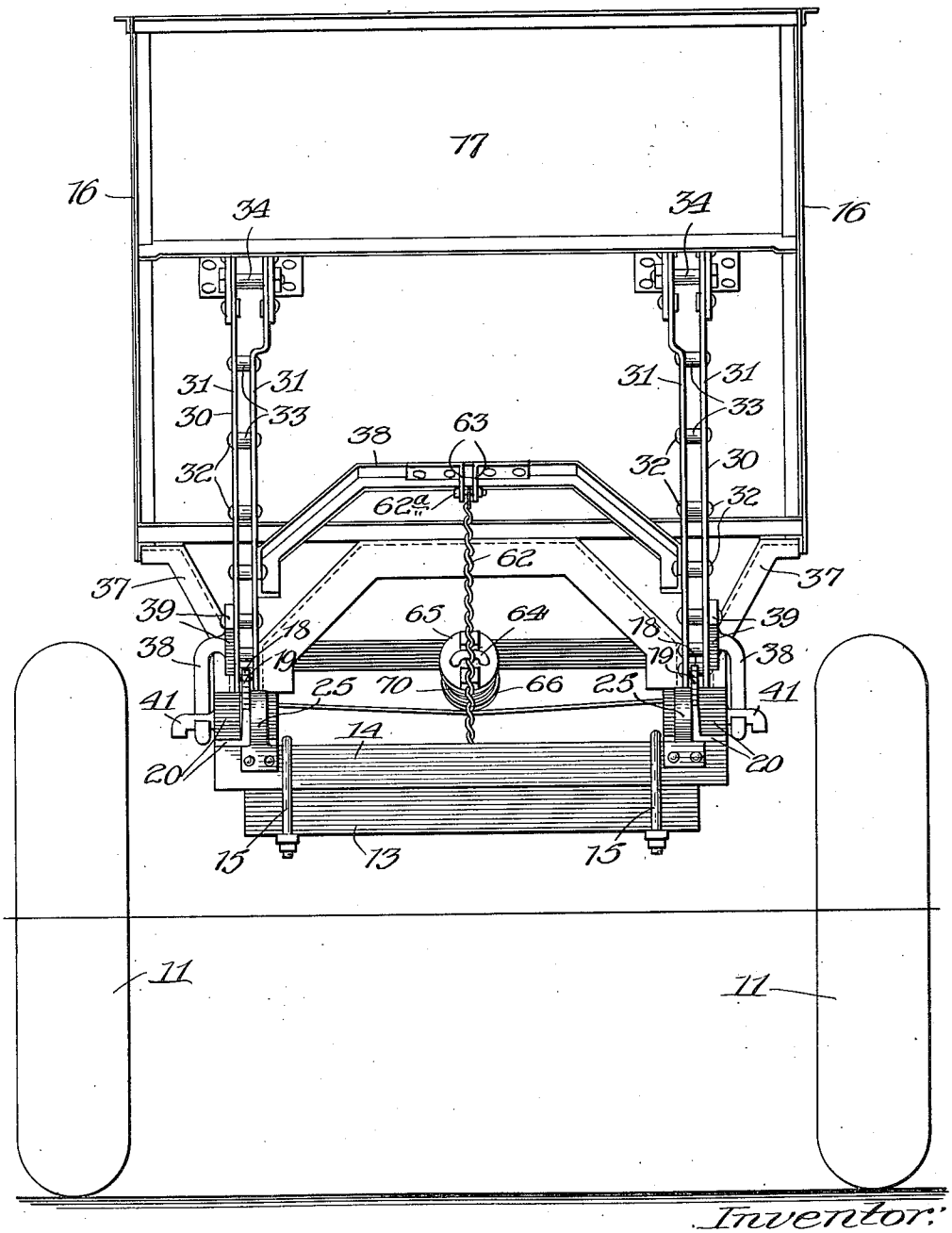
Fig. 2.



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LOAD CARRYING AND DUMPING VEHICLE

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Fig. 3.

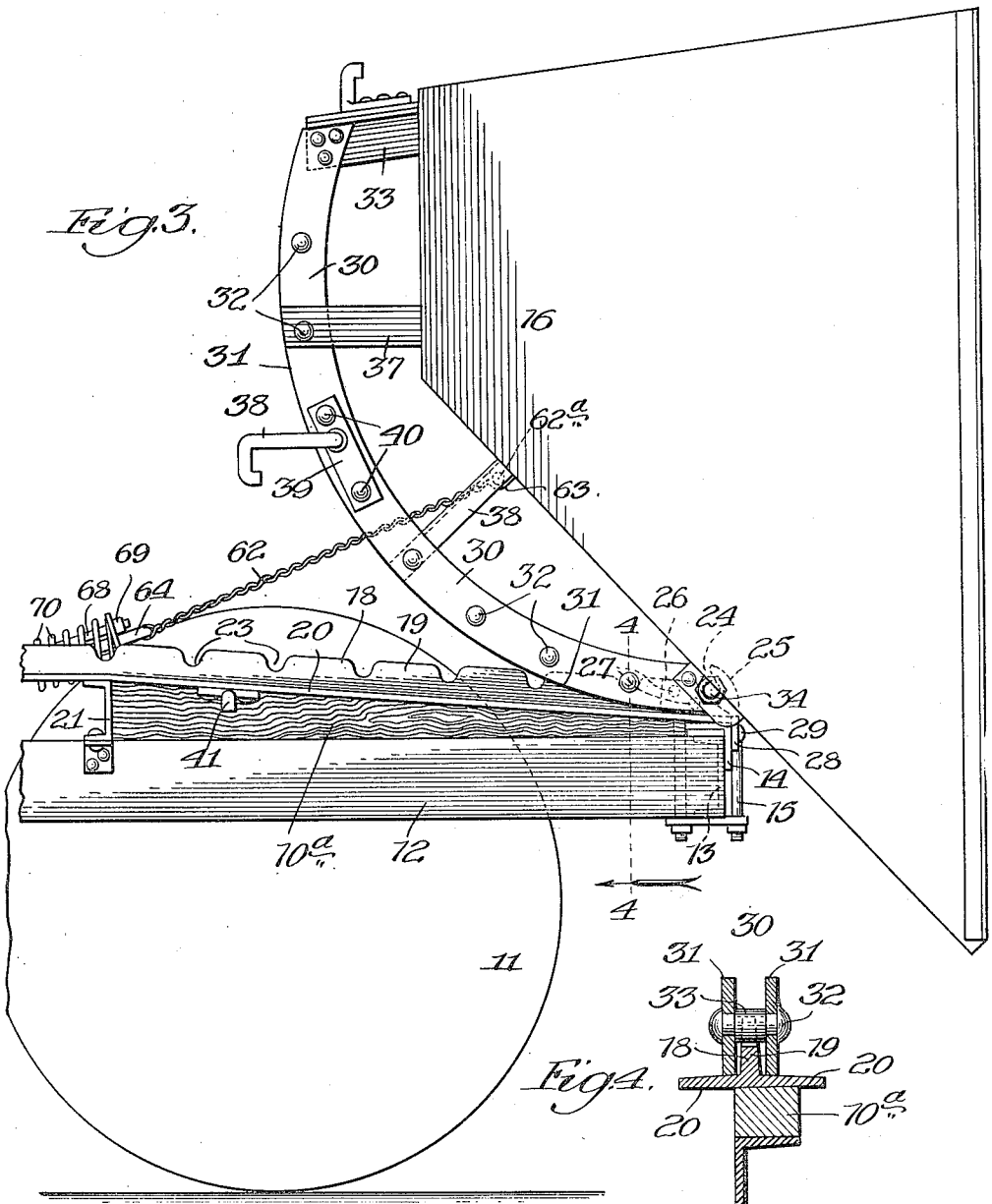

Fig. 4.

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LOAD CARRYING AND DUMPING VEHICLE

Filed July 25, 1921 4 Sheets-Sheet 4

Fig. 5.

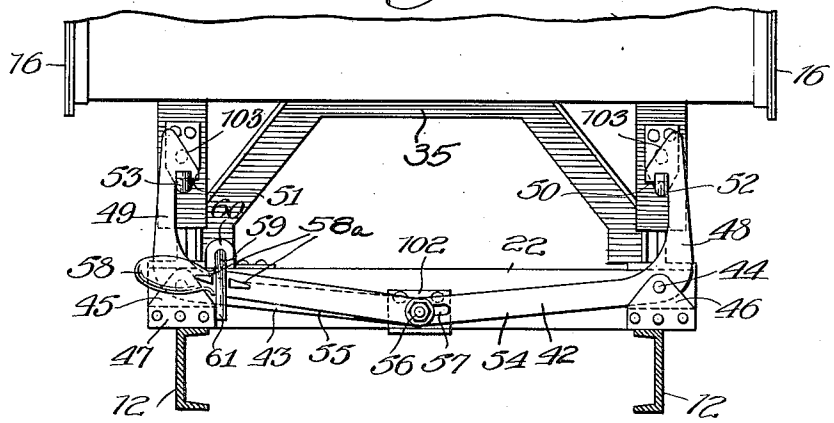


Fig. 6.

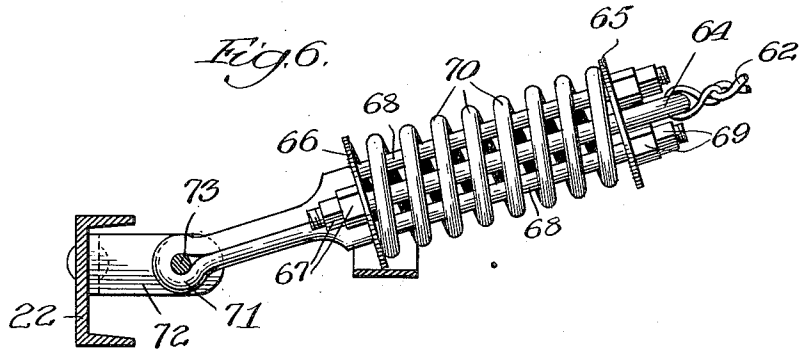


Fig. 7.

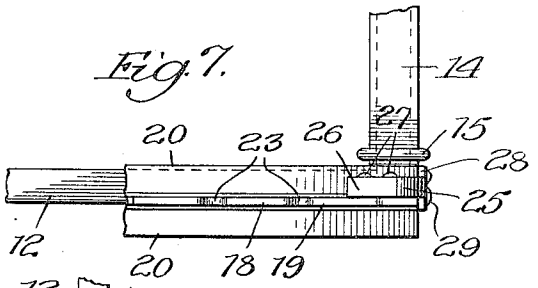
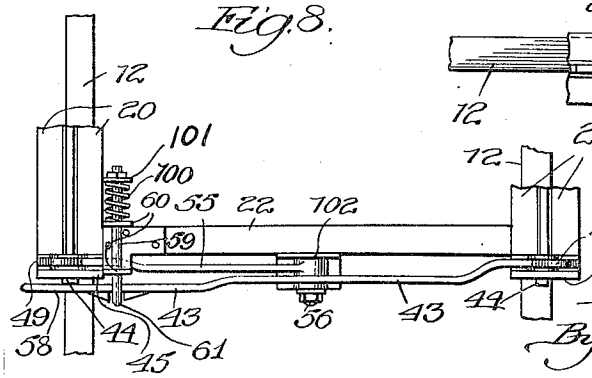


Fig. 8.



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Patented June 10, 1924. 1,497,348

UNITED STATES PATENT OFFICE.

FRANK J. REICHMANN, OF CHICAGO, ILLINOIS.

LOAD CARRYING AND DUMPING VEHICLE.

Application filed July 25, 1921. Serial No. 487,249.

To all whom it may concern:

Be it known that I, FRANK J. REICHMANN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Load Carrying and Dumping Vehicles, of which the following is a specification.

My invention relates more particularly to vehicles of the type in which a hopper is mounted upon the frame of the vehicle and is adapted to be rolled thereon from load-carrying to dumping position and vice versa.

My objects, generally stated, are to provide a novel, simple, inexpensive, positively operating and durable construction of the character stated; and more specifically certain of my objects are to provide improved means for locking the hopper in load-carrying position, the means at one portion of the hopper being so constructed that they will automatically move into locking position by the rolling of the hopper to load-carrying positions, and automatically release upon the rolling of the hopper toward dumping position; to provide a novel construction of track along which the hopper rolls and which will operate to shed material which may contact therewith, and thereby avoid derailment of the hopper, and its impairment; to provide a novel construction of track on the hopper whereby material contacting therewith will be prevented from lodging thereon; to provide a novel construction of check device for limiting the movement of the hopper to dumping position, which will be maintained at all times in proper alignment; to provide a locking means for the hopper of such construction that tendency of accidental release of the hopper will be reduced to the minimum; and other objects as will be manifest from the following description.

Referring to the accompanying drawings:

Figure 1 is a view in side elevation of the hopper-equipped portion of a rear-end-dumping vehicle, embodying my improvements, the hopper being shown in load-carrying position. Figure 2 is a view in end elevation of the construction shown in Fig. 1. Figure 3 is a view like Fig. 1 of the construction therein shown, showing the hopper in dumping position. Figure 4 is an enlarged section taken at the line 4—4 on Fig. 3 and viewed in the direction of the arrows. Figure 5 is a section taken at the line 5 on Fig. 1 and viewed in the direction of the arrows. Figure 6 is a sectional view showing a detail of the spring-check mechanism for the hopper. Figure 7 is a broken plan view illustrating a detail of the lower track and the adjacent pivoting lug; and Figure 8, a plan view of a detail of the locking mechanism.

In the particular construction illustrated, the frame of a vehicle is represented at 10, this frame in practice being supported on wheels the rear ones of which are represented at 11. The frame is shown as formed of the side members 12 spaced apart and connected together in any suitable way, the connection of these members at the rear extremity of the frame comprising a cross-member 13 secured to the side members 12 in any suitable way. The rear end of the frame 10 is also provided with an angle bar 14 extending crosswise thereof and rigidly held to the frame 10 as by the U-bolts represented at 15.

The hopper of the vehicle is represented at 16. This hopper may be of any desirable shape, as for example as shown in the drawing, the rear wall of the hopper and represented at 17 inclining upwardly and rearwardly from the bottom wall of the hopper.

The hopper 16 and frame 10 are provided with upper and lower tracks, respectively, which cooperate with each other to support the hopper on the frame and permit of the rolling of the hopper along the frame from load-carrying to dumping position and vice versa, a description of these tracks being as follows. The lower track is formed of two bars 18 of T-shape in cross-section, these bars extending lengthwise of the frame and being arranged parallel with each other at opposite sides of the frame, the flange portions 19 of these bars, which rise therefrom midway of the lateral edges of these bars, extending upwardly as shown. The bars 18 are supported on the frame referred to, at the base-portions 20 of these bars, the base-portions resting, in superposed position, on the upper horizontal portion of the angle cross-piece 14, on the upper flanges of I-beams 21 and 22 extending crosswise of the frame 10 and rigidly secured in superposed position, to the frame-members 12, and also on filler-members 10^a carried by the side-members 12. The forward ends of the bars

18 extend preferably substantially horizontally as shown, and their rear ends by preference, incline slightly downwardly toward the rear end of the frame 10, thereby forming a track the rear end of which is downwardly inclined rearwardly. The upper surfaces of the portions 19 of the bars 18 contain recesses 23 which are located at equal distances apart, and the bottom walls of which are preferably rounded as shown, the corresponding recesses 23 in these bars at opposite sides of the frame being directly opposed to each other in planes transverse to the axis of the frame, and being provided for a purpose hereinafter described.

The structure shown, at the rear ends of the track-forming bars 18, is provided with recesses 24, one at each bar, for cooperation with pivoting pins carried by the hopper 16 and hereinafter described, for providing a final pivoting movement of the hopper on the framework in its movement to dumping position. The recesses 24 are formed in members 25 which extend at their plate-like portions 26 alongside, and flatwise against, the rear ends of the portions 19 of the bars 18 to which they are secured as by the rivets 27, and extend at their plate-like rear portions 28 flatwise against the rear surface of the depending portion of the angle member 14 to which they are secured as by the rivets 29.

The upper tracks referred to are, in the construction shown, in the form of rockers represented at 30, these rockers being of general curved shape and located at opposite sides of the center line of the hopper 16. The rockers are each formed of a pair of curved bars 31 spaced apart in parallel relation and connected together at intervals by pins 32 which extend through tubular spacers 33 which hold the bars in proper spaced relation to each other. The pairs of bars 31 are connected at their forward, upper, ends to the body of the hopper 16, as indicated at 34, and at their rear, lower, ends, at which they extend beneath the bottom of the hopper, with the flange of a member 35 secured, in depending position, to the bottom of the body of the hopper, these rockers being connected at different points between their ends to flanges of depending yoke members 37 and 38 secured to the body of the hopper.

The rockers 30 engage the portions 20 of the track bars 18 at the under surfaces of the bars 31, the bars 31 of each pair thereof straddling the adjacent upwardly-extending portions 19 of the bars 18 with which they cooperate, the rockers rolling along the track surfaces 20 in the movement of the hopper from load-carrying position (Fig. 1) to dumping position (Fig. 3). The pins 32 are spaced apart equal distances, the spacing of these pins being the same as the spacing between the recesses 23, and in the rolling of the rockers along the tracks 20, these pins move into the recesses 23, in succession, and thereby prevent the hopper at all times from sliding on the lower track.

So far as the features of my invention are concerned, the hopper and upper and lower tracks may be so constructed and shaped that the hopper, when loaded, either will, or will not, tend to roll to dumping position and either will or will not automatically roll to dumping position, but in practice it is preferred to so construct and proportion the parts described that the hopper will automatically roll to dumping position when not restrained by holding means as for example those hereinafter described.

In the construction shown means are provided both in front of, and in the rear of, the portions of the rockers 30 at which they engage the tracks 20 when the hopper is in load-carrying position, for preventing it from jumping off the track in the movement of the vehicle from place to place and for holding the hopper in load-carrying position. The rear locking means comprise a pair of hook-shaped depending members 38 rigidly connected at their upper ends to the rockers 30, respectively, as by means of the plates 39 riveted to the rockers at 40, these depending members being so positioned that in the load-carrying position of the hopper they will extend at their hook portions beneath, and in interlocked position relative to, studs 41 extending laterally from the bars 18. The members 38 furthermore are so constructed and arranged, as shown, that when the hopper 16 rolls from load-carrying position toward dumping position they will automatically move forwardly at their hook ends out of interlocked position relative to the studs 41, and in the reverse movement of the hopper, to restore it to load-carrying position, they will automatically swing under the studs to the interlocked position shown in Fig. 1, it being preferred that these hook members be positioned in the rear of those portions of the surfaces of the rockers which contact with the lower track when the hopper is in load-carrying position.

The locking means at the front of the hopper are formed of a pair of bell-crank levers 42 and 43 pivoted, respectively, at their angle portions as represented at 44 and 45, to brackets 46 and 47 rigidly held on the frame member 12. The upwardly-extending portions 48 and 49 of these levers are provided with shoulders 50 and 51 which project toward the center line of the hopper, at which portions the levers 42 and 43 are adapted to interlockingly engage with studs 52 and 53 projecting forwardly from the member 35, these levers, when in the position stated, as represented in Fig. 5, serving

to restrain the hopper 16 from rotating to the right in Fig. 1 and preventing the latter, in combination with the depending members 38 and studs 41, from jumping bodily off the track. The other portions of the levers, represented at 54 and 55, extend toward the center line of the hopper, at which they are pivotally connected together through the medium of a pin 56, the opening in the portion 54 of the lever 48 and through which the pin 56 extends, being elongated as represented at 57, whereby upon applying force to either one of these levers, they will be simultaneously rocked at their upper ends in opposite directions. In the particular construction shown the lever 42 is extended beyond the pivot pin 56 to form a handle portion 58 by means of which these levers may be simultaneously operated as stated. Cooperating with these levers is a device which is movable, by the operator, into and out of a position in which it positively prevents the accidental rocking of the levers 42 and 43 to a position in which the shoulder portions 50 and 51 disengage from the studs 52 and 53 respectively, these means, shown as cooperating with the handle portion 58 of the lever 42, consisting of a bar 59 extending substantially horizontally and slidable back and forth in a guide member 60 secured to a stationary part of the frame, the forward end of the rod 59 having a depending portion 61 which, when this safety device is in position to lock the levers against actuation, extends across the front surface of the handle portion 58 and into the space between lugs 58^a on the latter, this rod structure, in this position extending across the top of the portion 58 and interlocking with the latter as shown (Fig. 8). A spring 100 surrounding the rear end of the rod 59 and confined between the guide member 60 and a stop 101 on the rod 59 yieldingly forces this rod rearwardly and when the rod is positioned as shown in Fig. 8 positively prevents the rocking of the levers 42 and 43 in a direction to release them from the studs 52 and 53.

The construction also involves a check spring device for limiting the tilting of the hopper 16 in dumping, this check spring device comprising a flexible medium such as a chain, represented at 62, this chain being connected at its rear end as by a bolt 62^a with a pair of ears 63 secured to the yoke member 38 preferably midway between the lateral sides of the hopper 16, and at its forward end to a yoke member 64 the ends of which extend slidingly through a plate 65 and through a plate 66, nuts 67 being screwed upon the front, threaded, ends of the arms of this yoke to form an interlock between the yoke and the plate 66. The device also comprises a yoke 68 which extends through the plates 65 and 66, through the latter guidingly, the rear ends of the arms of the yoke 68 being threaded and carrying nuts 69 which overlap the rear face of the plate 65, a coiled spring 70, surrounding the yokes 64 and 68, being confined between the plates 65 and 66. The forward end of the yoke member 68 is provided with an eye 71, this yoke being preferably formed of a rod bent upon itself to form the eye referred to, this eye being located between a pair of rearwardly-extending ears 72 secured to the frame of the vehicle in spaced-apart relation, and connected to the ears 72 through the medium of a pivot bolt 73 passing through the ears 72 and the eye 71. The ears 72 are so spaced that the eye 71 will be closely confined therein but still be permitted to have pivotal movement, the purpose of this construction being to hold this check device in proper alined condition relative to the hopper 16.

It will be understood from the foregoing that when the hopper 16 is in load-carrying position (Fig. 1), the hook members 38 will extend beneath the studs 41 and in interlocked relation therewith as shown, and the levers 42 and 43 will be interlocked with the studs 52 and 53 whereby the hopper 16 will be held by the two locking means referred to, against movement either to the right or to the left in Fig. 1, and furthermore will be held down on the track thereby preventing displacement of the hopper even when traveling over rough roads. When it is desired to dump the hopper 16, the operator pulls forwardly on the rod 59 against the resistance of the spring 100, and thereupon turns this rod in a direction to swing its portion 61 upwardly to cause the latter to clear the handle portion 58 and then releases his grasp on this rod whereupon it moves rearwardly under the action of the spring 100 to a position in which it is out of overlapped position relative to the handle portion 58. He then swings the handle portion 58 upwardly, thereby rocking the lever 42 in clockwise direction in Fig. 5 and through the medium of the pivoted connection 56 rocking the lever 43 in anti-clockwise direction in this figure to move the shoulder portions 50 and 51 of these levers out of a position in which they overlap the studs 52 and 53, respectively. The hopper is thus released for movement to dumping position and in moving at its rockers 30 along the track 20, toward dumping position, the members 38 are swung at their hook ends forwardly with the hopper 16, out of interlocking position relative to the studs 41. As the hopper nears the end of its movement to dumping position the pins 34 enter the recesses 24, thereby permitting of a final pivoting movement of the hopper on the support as for example to the position shown in Fig. 3, the check device referred to and of which the member 62 is a part, serving

to restrict the swinging movement of the hopper in the final pivoting movement stated. In the rolling of the hopper from dumping position to load-carrying position (Fig. 1), the hook members 38 automatically move into a position in which their hook ends extend beneath, and into interlocking relation to, the studs 41, and in this position the hopper is automatically locked at its forward end by the levers 42 and 43 interlocking at their shoulders with the studs 52 and 53. The levers 42 and 43 are preferably so constructed, as shown, that they will automatically swing toward each other at their upper extremities until restrained by a ledge-plate 102 mounted on the frame, this plate being so positioned that the inner inclined surfaces 103 of these levers will extend into the path of movement of the studs 52 and 53 in the movement of the hopper 16 to load-carrying position and thus be engaged thereby to rock these levers which latter drop back to interlocking position relative to the studs 52 and 53 as soon as the hopper reaches load-carrying position.

The upwardly-extending bar portions 19 of the bars 18 are preferably as narrow as they may be conveniently made, closely approaching a so-called knife edge, whereby any material dropping upon these bars will not be retained thereon, which is of advantage as will be manifest. The feature of providing the bars 31 spaced apart with the cross-pins 33 connecting them together is of advantage as thereby an open-work structure is provided preventing the retention thereon of any material which may fall upon these rockers, with the manifest advantage.

While I have illustrated and described a particular construction embodying my invention, I do not wish to be understood as intending to limit it thereto as the same may be variously modified and altered without departing from the spirit of my invention.

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

1. In a structure of the character set forth, the combination of a supporting element, a hopper element mounted thereon and adapted to roll on said supporting element, and locking means for said hopper in load-carrying position comprising studs on one of said elements, a pair of levers pivoted on the other of said elements directly pivoted together and having portions adapted when in one position to extend over said studs and in interlocking relation thereto, and means whereby when one of said levers is actuated to release it from one of said studs, the other thereof is simultaneously actuated to release it from the other of said studs, the parts being so constructed and arranged that said levers will become automatically interlocked with said studs in the movement of said hopper to load-carrying position.

2. In a structure of the character set forth, the combination of a supporting element, a hopper element mounted thereon and adapted to roll on said supporting element, locking means for said hopper in load-carrying position, comprising studs on said hopper, and levers pivoted on said supporting element and provided with shoulders at which said levers are adapted to extend over said studs and in interlocking relation thereto, the pivots of said levers and the points of engagement of said shoulders with said studs being substantially vertically alined.

3. In a structure of the character set forth, the combination of a support, a hopper provided with a rocker surface at which it is mounted on said support to roll thereon, and locking means for said hopper in load-carrying position comprising a member carried by said hopper and located in the rear of the portion of said rocker means engaging the support when the hopper is in load-carrying position, said member being adapted in the rolling of said hopper to load-carrying position to become automatically interlocked with a portion of said support and restrict rolling of said hopper in one direction and in the reverse movement of said hopper automatically moving out of interlocking position.

4. In a structure of the character set forth, the combination of a supporting element, a hopper element mounted thereon and adapted to roll on said supporting element, locking means for said hopper element in load-carrying position comprising studs on one of said elements, a pair of levers pivoted on the other of said elements and having portions adapted when in one position to extend over said studs and in interlocking relation thereto, and means whereby when one of said levers is actuated to release it from one of said studs, the other thereof is simultaneously actuated to release it from the other of said studs, a bar movable into and out of overlapping position relative to one of said levers for holding it against movement, said bar being also rotatable and having a portion extending at an angle thereto and adapted to oppose a face of the lever overlapped by said bar, and a spring operating to yieldingly hold said portion against said face of said last-referred-to lever, said last-referred-to lever containing a recess in said face into which said portion extends.

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