UNITED STATES PATENT OFFICE.

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BODY-DUMPING VEHICLE.

1,294,798.


Application filed June 3, 1918. Serial No. 237,853.

To all whom it may concern:

Be it known that I, GEORGE L. HARVEY, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Body-Dumping Vehicles, of which the following is a specification.

My invention relates to dumping trucks or wagons and has particular reference to a novel arrangement for lifting and tilting the body of such vehicles. A similar construction is shown in my co-pending application, Serial No. 245,926, filed July 16, 1918.

In the handling of coal and similar commodities it is desirable to provide a vehicle the body of which is capable of being tilted in order to discharge its load. Such devices have been commonly used. However, it is at times desirable to tilt the body to discharge at a low level and other times at a higher level in order to secure the requisite incline between the point of discharge from the wagon and the point of admission of the discharged contents into a receptacle.

Means have been provided for dumping a vehicle body by a combined lifting and tilting movement but the mechanism employed has been subject to many objections which are overcome in the device here disclosed.

It is desirable also to be able to adjust the extent of elevation of the body between its extreme limits, and in order to avoid complications, the mechanism for accomplishing this result should be capable of manual adjustment without the expenditure of more than ordinary force. In order to accomplish the desired result I have provided means whereby this adjustment may be effected with the parts in a position of rest.

The result is secured by merely shifting the fulcrum of the two body supporting beams. By changing this fulcrum the extent of elevation of the body with relation to a specified lift of the front end thereof may be controlled.

An object therefore in the present arrangement is to provide body tilting mechanism having the capacity of combined bodily elevating and tilting movements, the extent of elevation being adjustable by simple means. In order to render such a device peculiarly effective, the lifting force is applied in such manner as to secure the maximum lifting effect, the front end of the tilting body being elevated vertically during the first part of the lift no thrust on angularly disposed lifting links being required. This is a fundamental objection to many of the lifting devices heretofore proposed.

Not only may the device be lifted and tilted simultaneously and the extent of elevation be controlled by suitable manual adjustment, but means are provided rendering the bodily lifting means inoperative, in which case the body is tilted in the usual manner on the rear end of the vehicle frame as a fulcrum. Thus any degree of tilting or bodily elevating movement may be secured by the use of a minimum number of parts, the lifting or tilting force which is applied to the body being the same in each instance.

The invention will be more readily understood by reference to the accompanying drawings, wherein,

Figure 1 is a side elevation of a dumping vehicle, the body being shown in a tilted and elevated position; Fig. 2 is a bottom plan view thereof; Fig. 3 is a transverse vertical section on the line 3—3 of Fig. 4; Fig. 4 is a fragmentary, longitudinal sectional view on the line 4—4 of Fig. 3; Fig. 5 is a fragmentary detail view showing one form of elevating means which may be employed; Fig. 6 is an outline view similar to Fig. 1 showing the parts in a different elevated and tilted position, and, Fig. 7 is a similar view showing the parts in a tilted position, the means for elevating being inoperative.

In the drawings, the device is shown as applied to a vehicle, such as a motor truck, the same being provided with a main frame 10, of the usual form. Rigidly secured to the rear extremity of the frame are brackets 11, which serve as the bearings for a transverse shaft 12. This shaft acts as a pivot for one end of a beam which may be composed of two I-beams 13, 14, suitably united to act as a single element. A shaft 15, connects the beam at its forward end to the forward end of a body frame 16. The frame 16, may be constructed in any suitable manner to support a body 17, adapted to contain the material to be dumped. The use of a body frame may be found to be unnecessary in some instances, the body itself being of sufficient strength and stiffness to support the load. It will be understood therefore, that in the following specifica-
tion and claims the reference to a body frame includes by inference a construction in which no body frame as such is employed; the body itself being of sufficient strength to act as a frame.

It will be noted that the parts thus far described are so arranged that the body 17, may be tilted on the shaft 12, as a pivot, or it may be lifted bodily by elevating the rear end of the body at the same time the forward end is elevated. In order to accomplish such a result I provide a second beam which consists of the I-beams 18, 19, joined by the cross pieces 20, 21, as best shown in Fig. 2, in order to form in effect a single beam. This beam, which will be hereafter referred to by the numeral 18, is pivoted by means of the shaft 22, to the rear end of the body frame 16, and at the forward end the beam is provided with a loop or stirrup 23, acting as a bearing for a roller 24, which slidably engages a longitudinal beam 25.

At the intersection between the tilting and elevating beams 13, 18, respectively, I provide a fulcrum, (best shown in Figs. 1, 3 and 4) consisting of a casting or member 26, which embraces, by means of the depending ears 27, 28, the I-beams 18, 19, constituting the elevating beam. As shown, the beams 18, 19, are provided with ribs 29, 30, which are engaged by the undercut brackets or projections 31, 32, on the depending ears 27, 28. In the upper end of the casting 26, I mount a transverse shaft or pin 33, which serves as a support at its overhung ends for supporting and guiding loops or stirrups 34, 35, which embrace the members 18, 19, constituting the tilting beam. These stirrups are preferably of triangular form in elevation and rollers 36, 37, 38, are placed at the corners of the triangle, the rollers engaging the upper and lower surfaces of the I-beams 18, 19. These stirrups or loops have, as will be seen, the capacity for oscillation on the shaft 33, as a pivot.

Inasmuch as the position of the fulcrum controls the extent of elevation of the body, I have provided means for adjusting such position. This means comprises a worm or threaded shaft 39, which is anchored, with capacity for rotation in the transverse member 21, and has engagement with a threaded aperture in the member 26. The opposite end of the threaded shaft is squared as at 40, and may be engaged by a hand crank 41. Rotation of the shaft by means of the crank serves to move the fulcrum and its associated parts longitudinally of the beam 18. In Fig. 1 the fulcrum is shown at a point close to the rear end of the beam and thus the elevation of the tail end of the body is relatively slight. In Fig. 6, however, the fulcrum is shown at an intermediate point of the beam and the rear end elevation of the body is greater. The adjustment or movement of this fulcrum is effected while the parts are in a position of rest and there is no resistance to such movement. It may therefore be accomplished manually and with very simple mechanism.

If desired, some portion adjacent to the threaded shaft 39, such as the beam 23, may be graduated, as indicated at 39, the graduation preferably being such as to indicate the elevation in feet of the rear end of the body at different positions of the shiftable fulcrum 26.

In order to operate the device as a simple tilting body to secure the action shown in Fig. 7, the beam 25, (best shown in Fig. 1), is pivoted at its rear end on the shaft 12, its forward end being retained in the position shown by means of a loop 42, or other readily disengageable means. In normal operation the forward end of the beam 18, travels or slides freely on the beam 25, there being a tendency to lift the beam 25, and permit the parts to collapse into the position shown in Fig. 7. When it is desirable to tilt the body into the position of Fig. 7, the fastening device 42, is disengaged before the tilting action is begun, no further adjustment being necessary. When the body has been returned to its normal position, the holding device 42, may be returned to holding engagement if it is thereafter desired to elevate the body on the subsequent actuation.

As a means for elevating and tilting the body I have provided an elongated cylinder 43, having a plunger 44, carrying pulleys 45, at its upper end. Cables 46, are anchored at 47, these cables, after passing over the sheaves 45, engaging with the downward projecting arms 48, secured to the body or body frame. Thus the lifting action is applied to the extreme forward end of the body and in effect to the forward end of the beam 13. Thus the initial lift is in a straight line and there is no angular thrust on any links or levers. Of course, the lifting force may be applied in some other manner but it should be applied in a direct line to the beam 13, at a point as near its forward end as possible.

It will be apparent that there might be a reversal of some of the parts whereby the same result would be secured. For instance, the shifting bearing of the beam 18, might be placed at the end opposite to that shown and the adjustment of the fulcrum might be effected longitudinally of the beam 13. These and other modifications are considered to be within the scope of my invention.

I claim:

1. In a dumping device for vehicles, the combination of a vehicle frame, a dumping frame, and means for alternately bodily lifting and oscillating said dumping frame, said means including a pair of beams which are angularly disposed when in dumping
position, each beam being fixedly pivoted to opposite extremities of the dumping frame, and a slidable and adjustable fulcrum at the intersection of said beams, substantially as described.

2. In a dumping device for vehicles, the combination of a vehicle frame, a dumping frame, means for alternately bodily lifting and oscillating said frame, said means including a pair of beams which are angularly disposed when in dumping position, each beam being fixedly pivoted to opposite extremities of the dumping frame, a sliding fulcrum at the intersection of said beams, and means for adjusting said fulcrum longitudinally of one of said beams, whereby to change the amount of bodily lift of said dumping frame, substantially as described.

3. In a dumping vehicle, the combination of a main frame, a dumping frame, a tilting beam fixedly pivoted at one end to the rear of the main frame and at the other end to the front of the dumping frame, an elevating beam pivoted to the rear of the dumping frame, a third beam pivoted to the rear of the main frame at a point substantially coincident with the pivot of the tilting beam, said third beam providing a sliding bearing for the forward end of the elevating beam, and means for connecting said third beam to the main frame, and for disconnecting the same therefrom, substantially as described.

4. In a dumping vehicle, the combination of a main frame, a dumping frame, a beam fixedly pivoted to the rear end of the main frame and to the forward end of the dumping frame, a second beam pivoted to the rear end of the dumping frame and fulcrumed on the first beam at a point intermediate the length thereof, a third beam pivoted to the rear end of the main frame, said third beam providing a sliding bearing for the forward end of the second beam, substantially as described.

5. In a body dumping device, the combination of a supporting frame, a body frame, a beam pivoted at its ends to the supporting and body frames respectively, at the opposite ends thereof, a second beam angularly disposed with relation to the first beam when the parts are in tilting position, said second beam being pivoted to the body frame and having a sliding pivotal bearing on the supporting frame, and a shifting pivotal fulcrum comprising a portion adapted to be held in a relatively fixed position on one beam, loops pivoted to said fixed portion and adapted to guide and support the other beam, and means for adjusting the position of the fixed portion of said fulcrum on the beam on which it is held in a relatively fixed position whereby to control the extent of elevation of the dumping frame, substantially as described.

6. In a dumping vehicle, the combination of a main frame, a dumping frame, oppositely extending beams pivoted to the main and dumping frames, a fulcrum being provided at the intersection of the beams, one of said beams having the capacity for free sliding movement on said fulcrum, and means carried by the other beam for adjusting said fulcrum longitudinally thereof, substantially as described.

7. In a dumping vehicle, the combination of a main frame, a dumping frame, a beam extending from the forward end of the dumping frame to the rear end of the main frame, a second beam extending from the rear of the dumping frame forwardly to a point on the main frame, a fulcrum at the intersection of said beams, said first beam having the capacity for free sliding movement on said fulcrum, and means carried by the second beam for adjusting said fulcrum longitudinally on said beam, substantially as described.

8. In a dumping vehicle, the combination of a main frame, a dumping frame, a beam fixedly pivoted at one end to the forward end of the body and at the other end to the rear of the frame, a second beam fixedly pivoted to the rear of the body and having a sliding bearing on the vehicle frame, a sliding fulcrum at the intersection of said beams, and means for disconnecting the sliding bearing from the vehicle frame whereby the beams become inoperative and the body may be tilted without elevating it, substantially as described.

9. In a dumping vehicle, the combination of a vehicle frame, a body, a beam fixedly pivoted at one end to the forward end of the body and at the other end to the rear of the frame, a second beam extending from the front of the body to the rear of the frame, a third normally horizontal beam extending forwardly from the rear of the frame, said third beam providing a sliding bearing for the forward end of the second beam, and means for releasing the forward end of said third beam, thereby rendering said first and second beams inoperative and permitting the body to be
tilted without elevation, substantially as described.

11. In a dumping vehicle, the combination of a vehicle frame, a body, a beam fixedly pivoted at one end to the forward end of the body, a second beam fixedly pivoted to the rear of the body and having a sliding bearing on the vehicle frame, a sliding fulcrum at the intersection of said beams, and means for disconnecting the sliding bearing from the vehicle frame whereby the beams become inoperative and the body may be tilted without elevating it, substantially as described.

12. In a dumping vehicle, the combination of a main frame, a dumping frame, a beam extending from the forward end of the dumping frame to the rear end of the main frame, a beam extending forward to a point on the main frame, and slidably engaging the latter frame, a permanent fulcrum at the intersection of said beams, and means for disconnecting the sliding end of said second beam from the main frame whereby the second beam is rendered inoperative and the dumping frame may be tilted without elevating it, substantially as described.

13. In a dumping vehicle, the combination of a main frame, a dumping frame, a pair of oppositely extending beams forming the connection between said frames, said beams being permanently slidably connected at their intersection, and means for disconnecting the end of one beam from the main frame whereby the dumping frame may be tilted without elevating it, the connection between the beams serving to maintain both said beams in parallelism with the dumping frame during the tilting action, substantially as described.

14. In a dumping vehicle, the combination of a main frame, a dumping frame, a pair of oppositely extending beams forming the connection between said frames, a permanent fulcrum at the intersection of said beams, one of the beams having the capacity for free sliding movement relative to the other beam, and means for disconnecting the end of one beam from the main frame whereby the dumping frame may be tilted without elevating it, the connection between the beams serving to maintain both said beams in parallelism with the dumping frame during the tilting action, substantially as described.

15. In a dumping vehicle, the combination of a main frame, a dumping frame, a pair of oppositely extending beams forming the connection between said frames, one beam being permanently fulcrumed on the other at a point intermediate the length of the beams, and means for disconnecting the end of one beam from the main frame, whereby the dumping frame may be tilted without elevating it, the connection between the beams serving to maintain both said beams in parallelism with the dumping frame during the tilting action, substantially as described.

16. In an elevating and tilting dumping device, the combination of a main frame, a dumping frame, a pair of beams, one end of one beam being fixedly pivoted to one end of the dumping frame, and one end of the other beam being fixedly pivoted to the other end of the dumping frame, the opposite end of the last named beam being slidably pivoted to the main frame, one beam being permanently slidably fulcrumed on the other beam, and means for operatively disconnecting the end of the slidably pivoted beam from the main frame whereby the dumping frame may be tilted without elevating it, substantially as described.

17. In a dumping vehicle, the combination of main and dumping frames, a pair of oppositely extending beams providing a four-point support for the dumping frame, three of said points being in the form of fixed pivots, the fourth point being in the form of a sliding pivot, a sliding fulcrum at the intersection of said beams, and means for operatively disconnecting said sliding fourth point from the main frame whereby the dumping frame is supported on one point and may be tilted without elevating it, substantially as described.

18. In a dumping vehicle, the combination of main and dumping frames, a pair of oppositely extending beams providing a four-point support for the dumping frame, three of said points being in the form of fixed pivots, the fourth point being in the form of a sliding pivot, said beams being permanently slidably connected at their intersection, and means for operatively disconnecting said sliding fourth point from the main frame wherein the dumping frame is supported on one point and may be tilted without elevating it and the beams are allowed to remain in parallelism with each other and with the dumping frame, substantially as described.

19. In a dumping device, the combination of main and dumping frames, oppositely extending beams, one end of each of which is fixedly pivoted to the dumping frame, said beams being permanently slidably fulcrumed at the point of intersection of the longitudinal axes of the beams, and means for adjusting said fulcrum along the longitudinal axis of one beam without changing the relation of the fulcrum to the longitudinal axis of the other beam, substantially as described.

20. In a dumping device, the combination of main and dumping frames, a beam fixedly pivoted at one end to the dumping frame and at the other end to the main frame, a second oppositely extending beam fixedly
pivot at one end to the dumping frame and slidably pivot at its other end to the main frame, said beams being slidably fulcrumed at the intersection of their longitudinal axes, and means for adjusting said fulcrum along the longitudinal axis of one beam without changing the relation of the fulcrum to the longitudinal axis of the other beam, substantially as described.

Signed at Chicago, Ill., this 29th day of 10 May, 1918.

GEORGE L. HARVEY.

Witness:

T. D. BUTLER.