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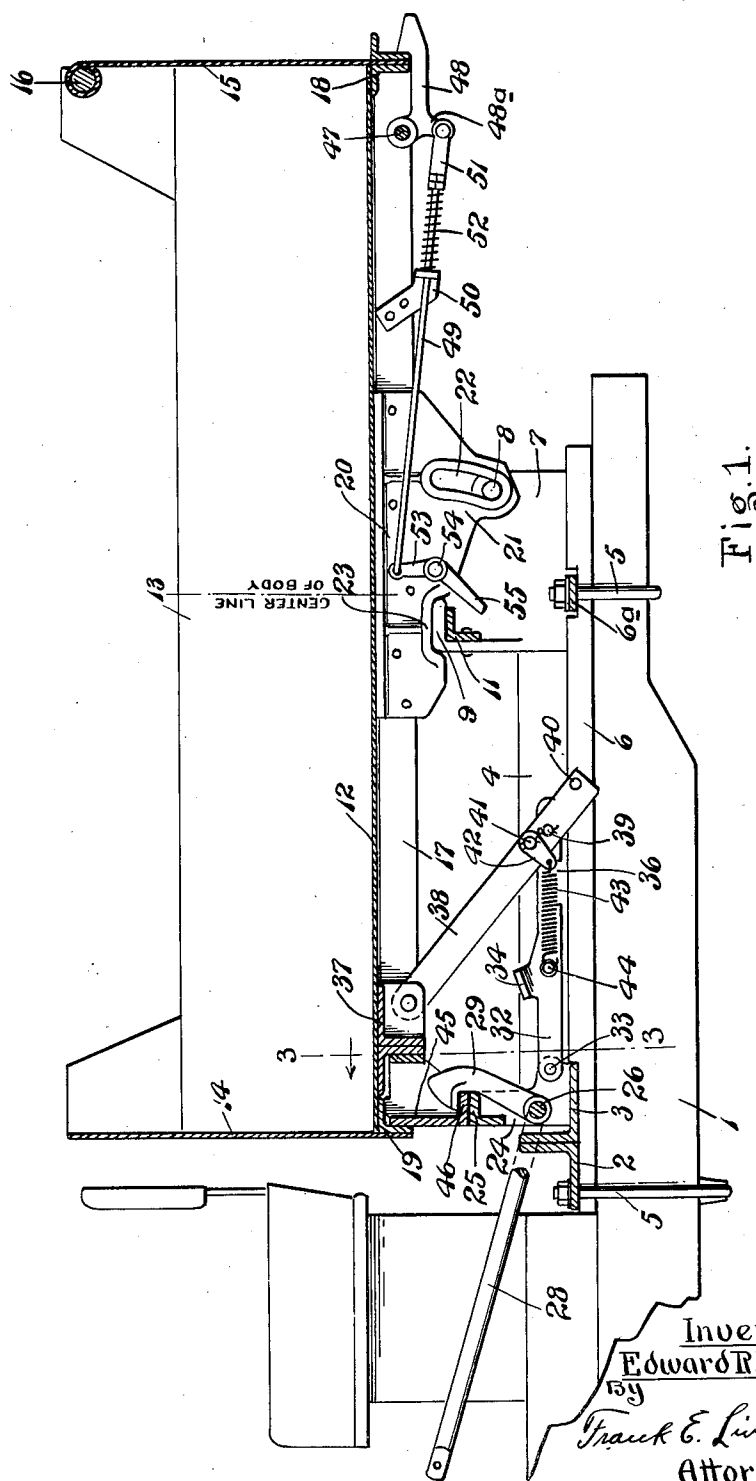
E. R. BARRETT

1,743,094

TILTING AND DUMPING BODY

Filed April 27, 1925

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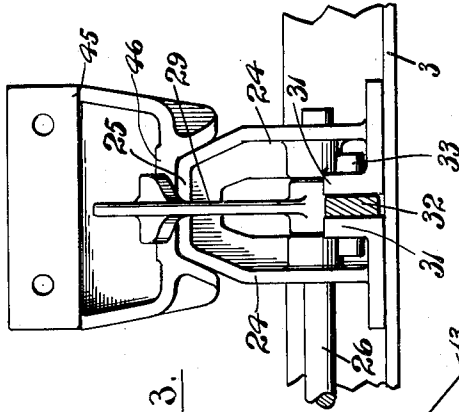
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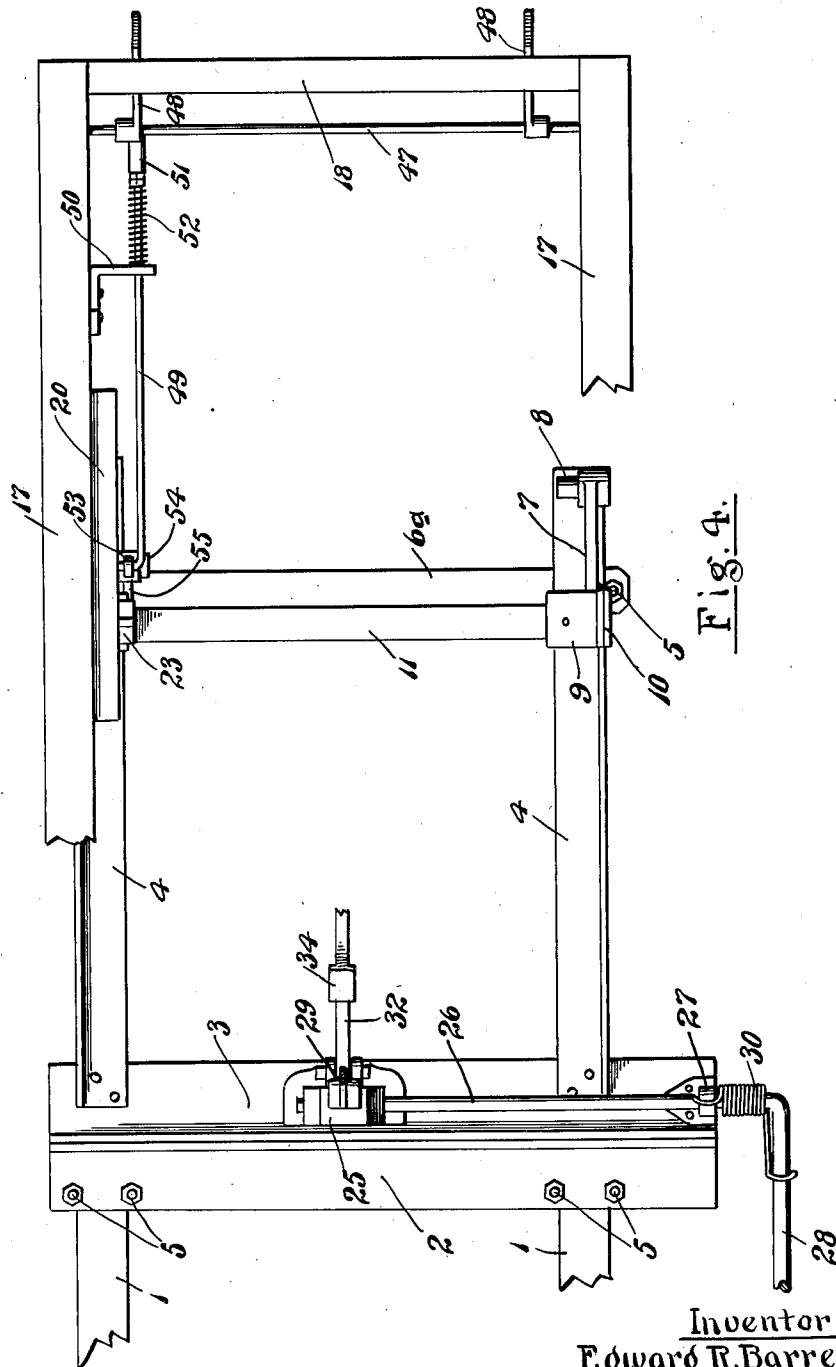
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Jan. 14, 1930.

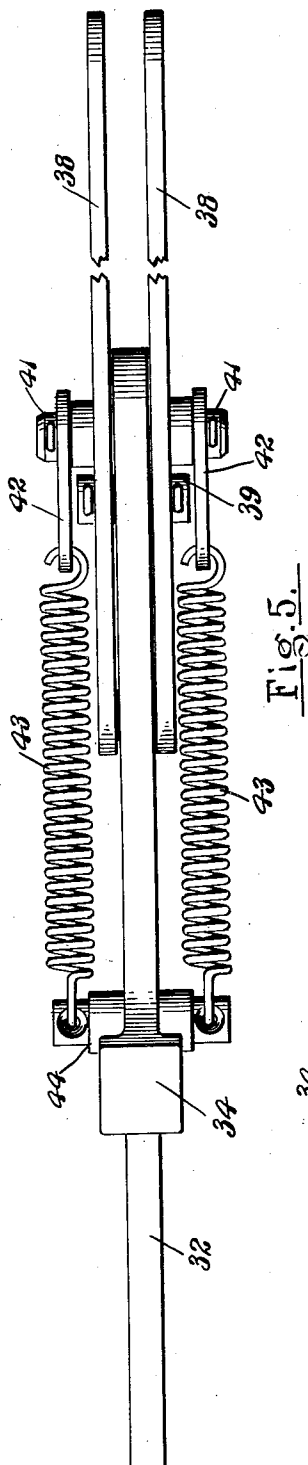
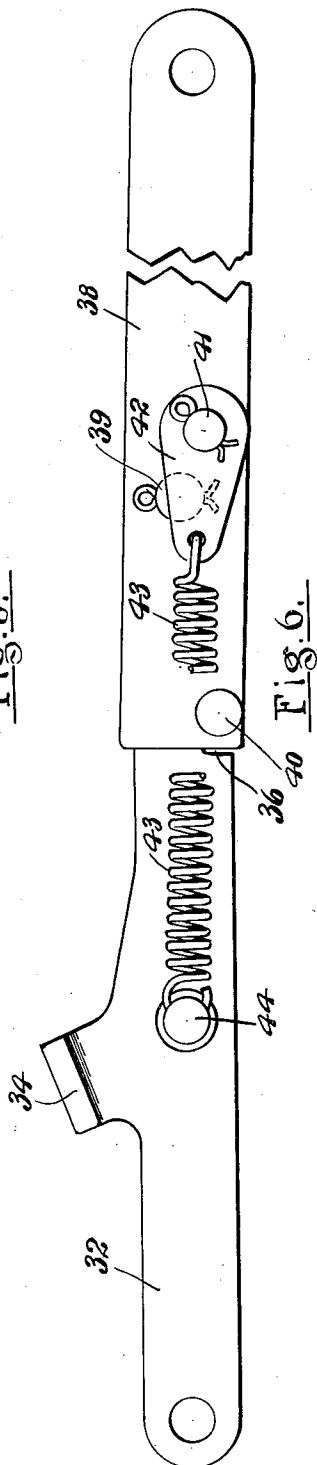
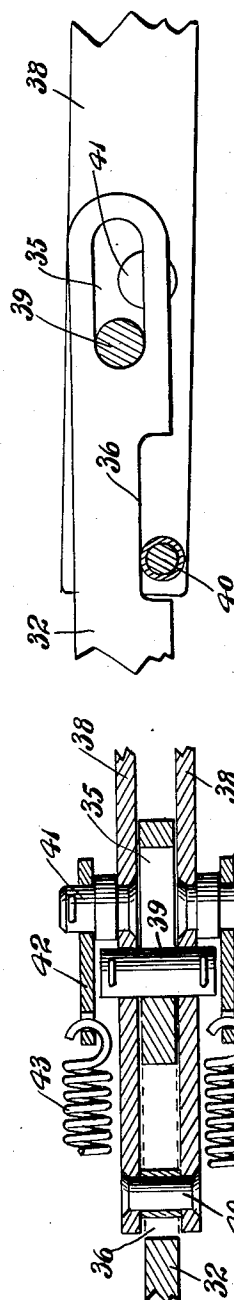
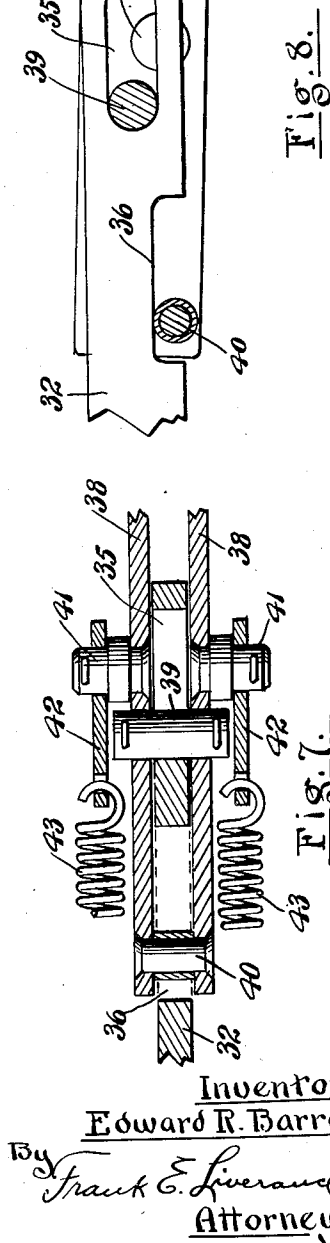
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Filed April 27, 1925

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TILTING AND DUMPING BODY

Application filed April 27, 1925. Serial No. 25,979.

This invention relates to tilting dumping bodies for trucks or other vehicles and is particularly concerned with a novel construction in and relating to tiltably mounted bodies which are designed to be readily moved to dumping position largely if not entirely through gravity, that is, the body is mounted so that when in horizontal position and with a load therein, when the body is free to move, it will normally move to tilted position or at least can be moved to such position with little or no effort.

The invention comprises many novel details of construction and arrangements of parts and improvements over the construction shown in my pending application for patent, Serial No. 643,190 filed June 4, 1923. Among these improvements are a novel latching mechanism for holding the body in lower horizontal position; a novel means mounted back of said latching mechanism which acts to check the movement of the body when it approaches its extreme upward tilting position and stop it without undue strains and jars on the construction and which, in connection with the latching mechanism, may be utilized to give the body a strong impulse toward movement to lower horizontal position after its contents has been dumped therefrom; and a novel means for automatically unlatching the tail gate to the body as the same is tilted upwardly, such mechanism being released and in position to automatically reengage with and latch said tail gate as it comes to closed position when the body moves back to normal horizontal position.

These and many other novel features of construction will appear fully and in detail as understanding of the invention is had from the following description taken in connection with the accompanying drawings, in which,

Fig. 1 is a longitudinal vertical section through a vehicle having a body mounted and latched thereon in accordance with my invention, the body being shown in lower horizontal position.

Fig. 2 is a like view illustrating the body in upper tilted and dumping position.

Fig. 3 is a fragmentary enlarged transverse section taken substantially on the plane

of line 3—3 of Fig. 1 and looking in a forward direction.

Fig. 4 is a plan of the chassis and subframe structure mounted thereon for carrying the body, the body except for some parts of its lower frame structure being omitted.

Fig. 5 is a plan view of a toggle or, as it is termed "stiff-leg" construction disposed between the body and the subframe at the front of the body.

Fig. 6 is a side elevation thereof.

Fig. 7 is a fragmentary horizontal section taken through the same between its ends, and

Fig. 8 is a fragmentary vertical section through said construction at a point between its ends.

Like reference characters refer to like parts in the different figures of the drawings.

The invention is designed particularly for use with motor vehicles, though not essentially limited thereto, and in the disclosure made the chassis side frame members 1 back of the driver's seat are utilized to support the dumping body. A subframe is mounted above the chassis frame including cross angle members 2 and 3 which are located directly back of the driver's seat and rails 4, also of angle formation, which are riveted or otherwise suitably secured at their front ends to the rearwardly extending horizontal flange of the angle member 3 to lie directly above the chassis side frame members 1. Bars 6 lie directly over and against the frame members 1 and the subframe is located upon said bars, the whole being very rigidly and securely attached to the chassis frame members by means of U-bolts 5, preferably. It is apparent that the particular and specific means used for making this attachment may be made widely different without departing from the invention.

Near the rear end of each bar 4 of the subframe a support 7 is located and secured, the same extending upwardly therefrom. The support is of the form shown and on the inner side of each of said supports and adjacent its upper rear corner an integral pin 8 is mounted and projects horizontally inward. At the upper front corner each support is formed with an inwardly extending horizon-

tal ledge 9 and at the outer side of each of said ledges a vertical guide flange 10 is provided, it being understood that the support 7 with its pin 8, ledge 9 and guide 10 are made in an integral casting. A cross bar 11 of angle formation extends between and under the ledges 9 and is permanently connected at its ends thereto, in this manner securely tying the supports 7 together.

The body may be of any preferred construction and is shown as having a bottom 12, spaced apart vertical sides 13, a front 14 and a tail gate 15 all of sheet metal. The tail gate is pivotally mounted on a horizontal rod 16 at its upper end whereby when the body is in horizontal position the tail gate will take a closed position but when the body is tilted upwardly at its front end the tail gate, if free to do so, will swing away from the body by gravity. The body is mounted on a suitable under-frame construction which includes side members or sills 17 connected at their rear and front ends by cross sills 18 and 19.

At each side of the body between its ends and underneath the same a member 20 is located and permanently secured in place at a point substantially midway between the front and rear ends of the body, being also connected preferably to the side sills 17. Each member 20 is in the form of a relatively heavy casting and has a downwardly extending portion 21 in which an arch-shaped slot 22 is formed. The pins 8 on the supports 7 extend into the slots 22 of the two members 20 carried on the under side of the body. Adjacent the front end and at the under side of each of the said members a flat horizontal seat 23 is made, which, when the body is in its lowermost position bears upon the ledges 9 and are guided thereon by the vertical guide flanges 10 heretofore described. This seat 23 is made in a relatively shallow recess in the under edge of the downwardly extending portion 21.

On the cross member 3 of the subframe midway between the side members 4 of the said frame a casting is permanently secured, including a base and upwardly extending spaced apart sides 24 which are connected at their upper ends by an integral cross member 25 of the form shown. A horizontal rod 26 passes through and has bearing in the two sides 24 of this casting extending outwardly to the end of the member 3 of the subframe and passing through a suitable bracket 27 attached to the end of said member 3. The rod 26 at its outer end is turned at right angles to make a handle 28 which extends forwardly and somewhat upwardly alongside the end of the driver's seat so as to be in very convenient position to be reached by the driver. A latch hook 29 is pinned or otherwise suitably secured to the rod 26 between the sides 24 of the casting hereto-

fore described, extending upwardly back of the part 25 and thence turning forwardly over the same, as best shown in Fig. 2. A coiled spring 30 disposed between the bracket 27 and the handle portion 28 normally has the tendency to move the latch hook forwardly, in which tendency it is aided by the weight of the handle portion 28.

The casting attached to the subframe cross member 3 is further formed with two upwardly extending ears 31 back of the latch hook 29. Between these ears the lower end of a bar 32, forming one element of the so-called "stiff-leg," is pivotally mounted as indicated at 33. This bar in the normal lower position of the truck body extends horizontally to the rear and is formed at its upper side between its ends with a projecting foot 34, while at its rear end it is formed with a somewhat elongated slot 35 and in its under edge a short distance in front of the slot 35 with an elongated recess 36, best shown in Fig. 8.

On the under side of the bottom 12 of the truck body a fixture or bracket 34 is suitably secured to which the upper ends of the two parallel bars 38 are pivotally connected. These bars extend to the rear end of the bar 32, passing one on each side thereof. A pivot pin 39 passes through suitable openings in the bars 38 a distance from their ends and through the slot 35 in the bar 32, the pin 39 being held against disengagement by suitable cotter pins which pass through its ends. At the free ends of the bars 38 a relatively large rivet or pin 40 passes through and is secured to the same as shown in Fig. 7, a suitable spacing sleeve being located over this rivet between the bars 38 which, in one position of the bars, is received in the recess 36 of bar 32 (see Fig. 8).

Two pins are permanently connected one to each of the bars 38 a short distance above the points where the pivot pin 39 passes therethrough. Said pins extend outwardly and on the projecting end of each a short arm 42 is loosely mounted. A heavy coiled spring 43 is connected at one end to the free end of each of the arms 42 and at its opposite end to a pin 44 extending through and attached to the bar 32 substantially midway between pivots 33 and 39.

On the under side of the body at its front end a fixture 45 is permanently secured which, in the lowermost position of the body, is adapted to come directly over and seat against the connecting part 25 previously described. It likewise is formed with a ledge 46 which seats against the part 25 so that the latch hook 29 may pass thereover. The hook is formed with the usual cam edge whereby on downward movement of the body to horizontal position the hook is automatically moved backwardly until the ledge at 46 has passed by whereupon the hook automatically

moves forward to engage therewith and latch the body against tilting movement when in lower horizontal position.

As thus constructed it is apparent that when the truck is in lower horizontal position the weight is carried largely, in fact almost wholly, on the ledges 9 of the support 7 and with the body loaded evenly or unloaded the center of gravity is a short distance back of said ledges 9 so that when the latch hook 29 is moved to free the body for tilting movement it will automatically turn on said ledges elevating the forward and depressing the rear end of the body. If the load should not be evenly distributed and the center of gravity should be located farther ahead or directly over the ledge or even slightly in front of the ledge 9 it requires but little effort to start the front end of the body in its upward movement. This movement continues until the slots 22 in the parts 21 have moved to a position such that pins 8 are in the upper ends of the slots, whereupon any further tilting movement will be about the common horizontal axis of these pins. But the body having by this time been elevated at its forward end to a considerable extent and the load having moved downwardly toward the rear end of the body there will be no tendency for the body to return to horizontal position on account of the fact that the axis of the pins 8 about which it now turns is located farther back.

As the forward end of the body is elevated the "stiff-leg" construction, comprising the bars 32 and 38, moves from the position shown in Fig. 1 toward that shown in Fig. 2. Springs 43 being under tension have a normal tendency to pull the pivot pin 39 and the rivet 40 to the position shown in Fig. 8. With the approach of the body to uppermost position bars 32 and 38 will come into alignment, as shown in Fig. 2, and the arms 42 and center lines of the springs 43 will be in alignment. With the final upward movement of the upper end of the body and under the momentum of said movement the so-called "stiff-leg" construction will tend to elongate, that is, the pins 39 and 40 will move along the slot 35 and recess 36 but this movement will be opposed by springs 43 which must be stretched to permit this elongation. There is, accordingly, a shock absorbing function inherent in the springs as assembled with the other parts of the structure and the upward tilting movement of the body will be brought to a stop without undue strains and jars, the stopping being cushioned by reason of the action of the springs.

It will also be apparent that in their aligned position the bars 32 and 38 are held between spring 43 against backward movement, the line of force of the springs having passed across the pivotal axis of the pin 39 joining the two members of the "stiff-leg" or toggle

formed thereby. And the body will be held in upper tilted position by reason of this construction and insurance had against accidental or otherwise undesired tendency of the body to turn back to or toward horizontal position. This is many times of value, particularly where the character of the road is such that the motor vehicle is not on a level. For instance, if the vehicle is standing on a downward incline there may be a tendency after the load is dumped for the body to return to horizontal position and the "stiff-leg" construction insures against this. On the other hand, if the vehicle faces or is on an upward incline there may be a strong tendency for the body to continue its tilting movement which, if it went far enough, might up-end the entire motor vehicle; and this also is insured against by the structure described.

After the body has been dumped and it is desired to return it to lower horizontal position it is necessary only for the driver to grasp the handle 28 and pull upwardly on the same whereupon the latch hook 29 bears against the foot 34 and moves the "stiff-leg" to the rear carrying the line of force of the springs across the axis of the pivot connecting bars 32 and 38. The body in this operation turning about the axis of the pins 8 comes downwardly by gravity until the seats at 23 bear against ledges 9. However the springs having been under considerable tension, when the latch hook 29 is moved to the rear, said body is given a considerable impetus toward return to its normal position by the springs; and if the position of the truck on an inclined road is such that the body does not freely return to lower position it is evident that the handle at 28 may be turned through a wide arc with a consequent bearing of the latch hook 29 against the hook 24 through a wide arc thereby drawing the front end of the body down to a position such that it is easily grasped by the driver and forced down the remaining distance, and this without the necessity of the driver leaving the vehicle seat.

At the rear end and on the under side of the body a cross shaft 47 is rotatably mounted on which hooks 48 are secured, the hooked ends of which extend beyond the rear end of the body so as to engage with the lower edge of the tail gate 15. One of the hooks is provided with a downwardly extending short arm 48^a. A rod 49 is slidably mounted through a bracket 50 attached to the adjacent side sill 17 and the end of this rod has connection with a member 51 of larger diameter which is pivotally connected at its rear end to the arm 48^a. A coiled spring 52 under compression is disposed between the bracket 50 and the member 51, the tendency of which is to rock the shaft 47 and elevate the hooks to engaging position with the tail gate.

Rod 49 extends forwardly and upwardly

and at its front end is connected with the upper end of one arm 53 of the bell crank lever pivotally mounted at 54 on the member 20. Said bell crank lever includes a downwardly and forwardly extending free arm 55 which, when the body is in its horizontal position, is located a short distance below the cross bar 11 disposed between the supports 7.

When the body is tilted, during the first portion of its movement the tail gate is held closed but with further movement the end of the free arm 55 of the bell crank lever comes against the cross bar 11 or the adjacent ledge 9 thereby turning the bell crank lever in a counter-clockwise direction and resulting in a longitudinal movement of the rod 49 and compression of the spring 52 thereby rocking the shaft 47 and moving the hooks 48 to inoperative position. This frees the tail gate so that it may turn outwardly by gravity and permit the dumping of the contents carried by the body. When the body is returned to horizontal position the free arm 55 of the bell crank lever, when it disengages from the cross bar 11, frees the spring 52 and thereby rocks shaft 47, bringing the hook members 48 back into position to be engaged by the lower edge of the tail gate when it comes to closed position, the lower edge of said gate riding over the upper inclined edges of the hooks and automatically latching therewith as is evident.

The construction described is thoroughly practical and efficient and has so proved in practice. The relatively wide ledge at 9 and the bearing surfaces at 23 resting thereon are sufficient to withstand the severe usage and pressure to which they are subjected. This is particularly necessary as the weight of the body and its contents is carried almost wholly on said ledges and the tilting movements on the ledges occur when the full weight of the body contents is still carried by the body. The pressure on the pins 8 is less and occurs for only a brief time so that pins of the form shown are sufficient to take care of this. The so-called "stiff-leg" construction is very effective and secures a great many advantageous results, including the checking of the body movement as it approaches its uppermost position, the holding of the body against too extreme tilting movement and, combined with the latch mechanism, serving to carry the dumped body back to normal horizontal position or at least give it a strong impulse toward such movement. At the same time the position of the latch mechanism and, particularly, of the operating handle associated therewith is such that the driver of the vehicle may perform all operations necessary without leaving his seat. All of these features together with the novel construction used for automatic tail gate latching and unlatching combine to make the invention one of particular value and merit.

The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In combination, a vehicle, a dumping body located above the rear portion of the vehicle directly back of the driver's seat therefor, means for mounting the body on the vehicle for tilting movement from a horizontal to an inclined position and vice versa, a toggle including a member attached at one end to the under side of the body and another member pivotally connected to the vehicle, said members adjacent their inner ends being provided with a pin and slot connection, an arm pivotally mounted on one of said members and a coiled spring connected to the end of said arm at one end and to the other of said members at its opposite end, substantially as described.

2. In combination, a vehicle, a dumping body located above the rear portion of the vehicle, means for mounting the body on the vehicle for tilting movement from a horizontal to an inclined position and vice versa, a bar pivotally connected at one end to the vehicle, a pair of bars pivotally connected at their upper ends to the under side of the body and extending toward the first bar to pass one at each side of the first bar, said first bar adjacent its opposite end being formed with an elongated slot therein, a pin passing through said slot and through the said pair of bars a distance from the free ends of said pair of bars, an arm pivotally mounted one on each of said pair of bars, a coiled spring connected at one end to the free end of each of said arms and at its opposite end to the first bar at a point between its ends, and a pin disposed between and at the free ends of said pair of bars adapted when all of the bars are in alignment to bear against the edge of the first bar, substantially as and for the purposes described.

3. A construction containing the elements in combination defined in claim 2, said first named bar at its upper edge and between its ends being provided with a projection foot, a rod mounted horizontally for turning movements in front of said first bar, means for turning said rod, and a member extending upwardly from said rod against which the foot bears when the body is in tilted position and said bars are disposed in alignment whereby on turning the rod to the rear said alignment of the bars is broken and the body given an impulse from the springs toward return to horizontal position.

4. In combination, a vehicle having a chassis frame, a subframe mounted above the rear portion of the chassis frame including a cross bar and two spaced apart rearwardly extending bars attached at their front ends to the cross bar and located one above each side member of the chassis frame, means for

connecting the subframe to the chassis frame, a casting connected to a cross member of the subframe between its ends, a rod rotatably mounted at one end in and extending through said casting, said rod extending outwardly beyond the end of the cross member of the subframe, a bearing for carrying the outer end of the rod, a handle at the outer end of the rod disposed at right angles thereto, a latch hook connected to the rod adjacent said casting, a body carried by and above the subframe near its rear end and mounted for tilting movement from a horizontal to an inclined position and vice versa, means connected to the under side and at the front end of said body adapted in lower position to rest on the upper end of said casting and be engaged by said latch hook to latch the body against tilting movement, the handle of said rod extending forward alongside the end of the driver's seat of the vehicle, a toggle construction pivotally connected at one end to said casting and at its other end to said body including two members pivotally and slidably connected together at their adjacent ends, spring means disposed between the members of the toggle, said means being stretched on sliding movement of one of the members of the toggle with respect to the other in one direction, thereby serving to yieldingly check upward tilting movement of the body, said spring means also, when said toggle members are in alignment and the body is tilted, having their line of force carried across the pivotal axis of the pivot joining said members and thereby holding the body against return to horizontal position, the lowermost of said members of the toggle, when the body is in tilted position lying directly back of the latch hook whereby it may be operated by movement of said latch hook on manually turning the rod to which the hook is connected to free the body to return to lower position.

In testimony whereof I affix my signature.
EDWARD R. BARRETT.