Feb. 24, 1931. G. H. PERKINS ET AL 1,794,318

DUMPING BODY

Filed Aug. 26, 1930 4 Sheets-Sheet 1

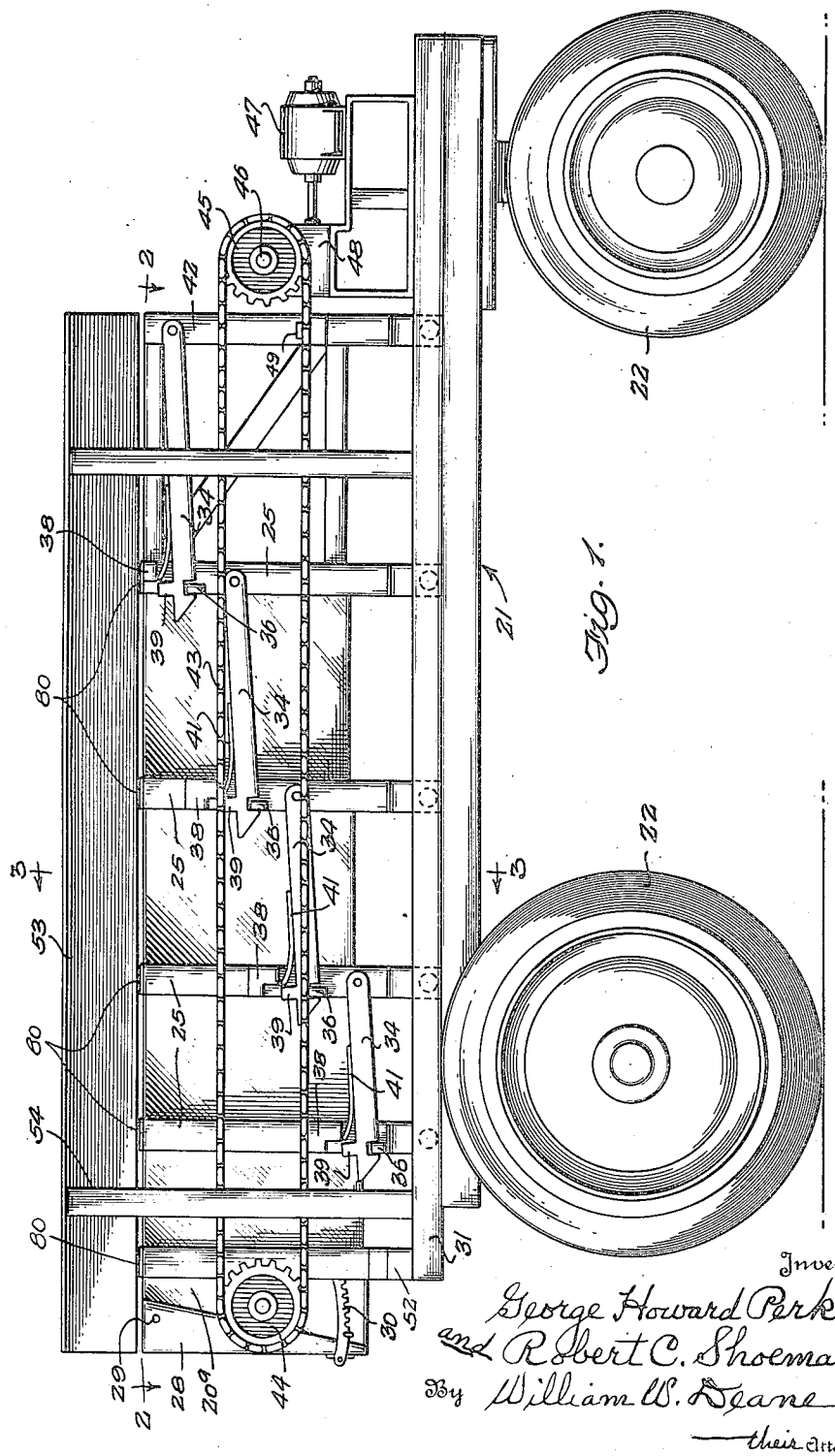


Fig. 1.

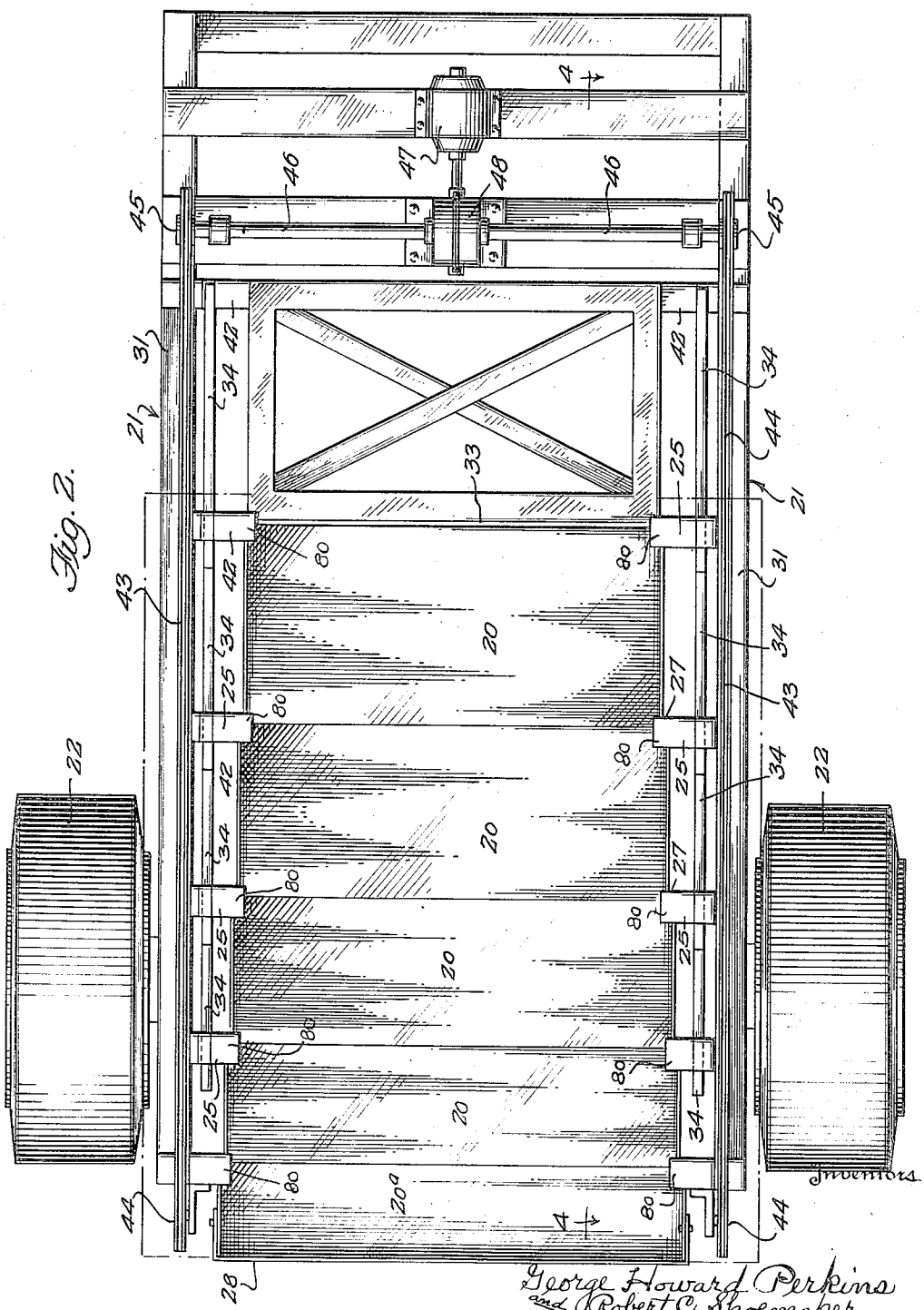
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DUMPING BODY

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Fig. 2.



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DUMPING BODY

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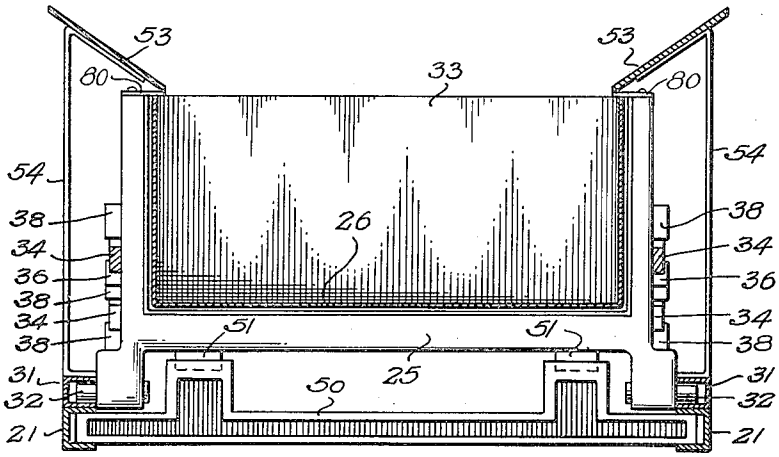


Fig. 3.

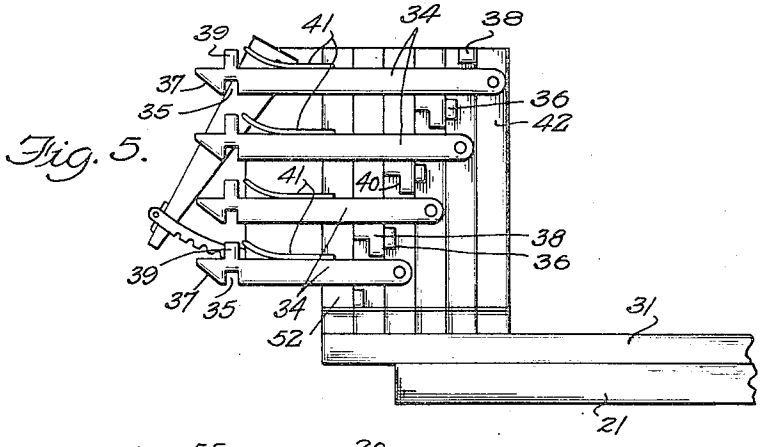


Fig. 5.

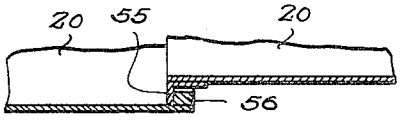


Fig. 7.

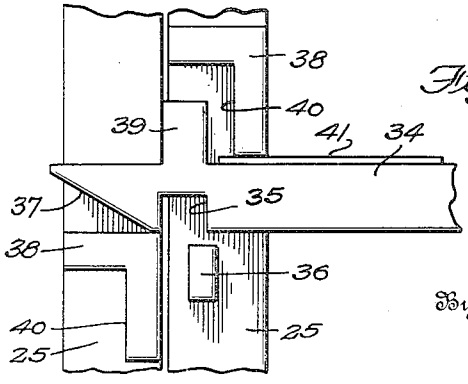


Fig. 6.

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DUMPING BODY

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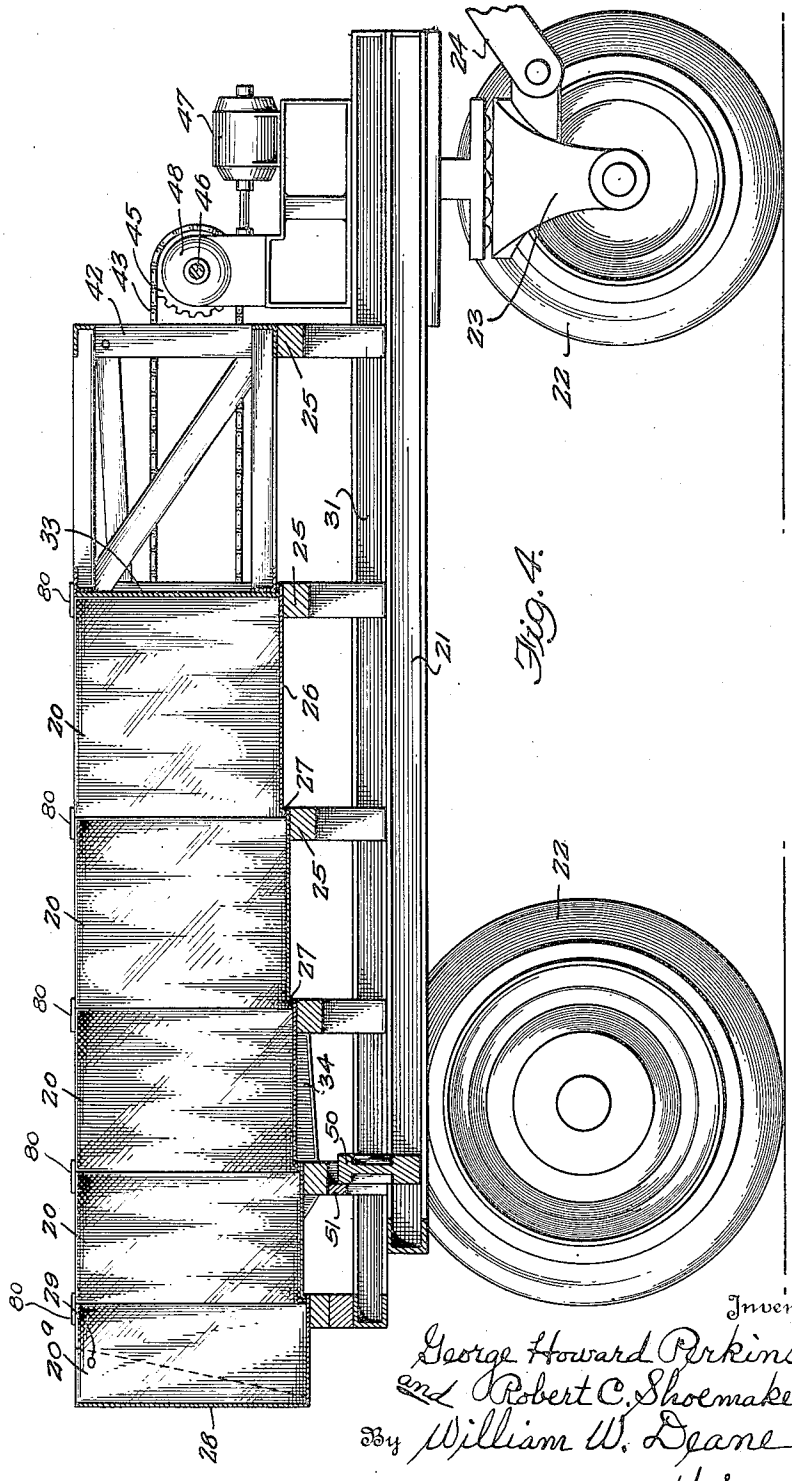


Fig. 4.

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UNITED STATES PATENT OFFICE

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DUMPING BODY

Application filed August 26, 1930. Serial No. 477,960.

A dumping body whether it be of the terminal pivotal or balanced pivotal form, is not adapted to the effective control of the load in discharging, nor is the latter adapted to discharge into a hopper or trough by reason of the depression of the discharge end in dumping. If the body be of collapsible form, however, both the control of the load in discharge and the maintenance of the normal level of the discharge end is possible. But in collapsing the telescoping or similarly related sections of such a body, if the sections are not coordinated to collapse progressively, any easy flowing or soft material, like river mud or mixed wet concrete will slop over; or, if the material be stiff and of a coherent nature when compressed, as damp sand, clay or certain asphaltic mixtures, it will be compacted to such an extent in the expelling operation that it will be difficult to handle after unloading by reason of appearing on the deposited surface in large compressed lumps.

It is the purpose of the present invention, therefore, to provide a dumping body of the collapsible form so as to secure the advantages resulting from maintaining the discharge end in its normally horizontal plane during the unloading operation; to provide for the progressive closing or collapsing of the sections, so that there may be no undue compression of stiff material or slopping over of loose or easy flowing material in the expelling operation; to provide each section, where it engages an adjacent section, with means for scraping the bottom or floor and sides of that section to effectively remove any normally adherent particles; to provide a collapsing means which is stationed at a fixed point on the vehicle by which the body is carried and which requires but the minimum power for operation; and generally, to provide a dumping body of the collapsible form which is reduced to the simplest construction and which is, therefore, susceptible of cheap manufacture.

With this object in view, the invention consists in a construction and combination of parts of which a preferred embodiment is illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevational view of the invention.

Figure 2 is a horizontal, longitudinal sectional view on the plane indicated by the line 2—2 of Fig. 1.

Figure 3 is a transverse, vertical sectional view on the plane indicated by the line 3—3 of Fig. 1.

Figure 4 is a vertical, longitudinal sectional view on the plane indicated by the line 4—4 of Fig. 2.

Figure 5 is a detail side elevational view of the body sections in collapsed position.

Figure 6 is an enlarged elevational view showing the latch member in its intermediate position.

Figure 7 is a detail sectional view of a modified form of construction of the body sections.

The invention comprises the relatively movable sections 20, so that the body may be collapsed in expelling or discharging a contained load. To collapse the sections, it appears best that they be telescopically related and they are so disclosed, all of the sections except the rear terminal section 20*a*, being movable longitudinally of the frame 21 of the vehicular apparatus on which the body is carried. While the frame may be mounted on caterpillar trucks, or any other devices which will permit ready translation, it is illustrated as mounted on the wheels 22 of which the forward pair are carried on a pivoted truck 23, equipped with a draft tongue 24 which may be for use either with draft animals, or for connection to the draw-bar of a tractor or similar machine.

Each of the body sections 20 consists of a U-shaped member 25 and a correspondingly shaped trough member 26, the trough member being made preferably of sheet material of a character necessary to stand the usage to which the body is put and the U-shaped member of sturdy construction to prevent distortion of the trough member, its legs acting as uprights for the trough member.

Beginning with the tail section 20*a*, the several body sections are of progressively increasing length, each trough member exceeding in length that of the next preceding

section by an amount equal to the width of the legs of its U-shaped member 25, so that the rear ends of all may lie in substantially the same vertical plane when the sections are collapsed. Each trough member is supported at its forward end by its U-shaped member and at its rear end lies in the trough member of the next adjacent rear section, its rear edge being turned outwardly, as indicated at 27, to provide a marginal scraping edge intended to clean the walls and floor of said adjacent rear trough member of any adherent particles when the body sections are collapsing. The troughs and the end gate are each held down into its fellow by a horizontally extending member 80 protruding from the top of the U-shaped member into which the respective trough shaped members slide.

The rear section 20*a* being stationary, with all the other sections moving into it, no turned edge, such as the turned edge 27, is necessary. Instead, it is provided with a tail gate 28 pivotally mounted, preferably at the upper end, as indicated at 29, and equipped with stepped latches 30 by which it may be latched in closed position or set to provide any degree of opening desired.

The tail section 20*a* is fixed in position by having its U-shaped member 25 secured directly to the side rails 31 of the frame 21 and the movability of the remaining sections is secured by equipping their U-shaped members with rolls 32 journalled in the lower ends of the legs of the same and traversing the rails 31. It is obvious that this construction provides for the movement of each of the body sections into the next adjacent rear section and when the sections are fully collapsed or telescoped they will be all nested one within the other and the contents of the body will have been fully discharged with the exception of that in the extreme forward section whose contents is displaced by the head gate 33 which is movable relative to said forward section.

If the collapsing or telescoping of the sections be not so arranged that they will successively nest, beginning with the section next adjacent the rear section 20*a*, the collapsing may begin at the center, at the forward end, or at any other point, and, if the contained load be of a loose or non-coherent character, it may be forced over the sides of the body rather than ejected from the rear section, or if it be of a stiff or coherent nature, it may be unduly compressed before ejection. Also if the collapsing or telescoping of the sections is not controlled to insure successive nesting and collapsing begins adjacent or ahead of the center of the body, all of that portion of the load to the rear of the point of initial collapse will have to be moved relative to and throughout the extent of the uncollapsed sections. If the sections collapse in sequence as provided for in the construction disclosed herein, the rear section is first emptied, then the next and so on in order until the final or forward section is emptied by the movement of the head gate, and under such conditions the frictional resistance resulting from the ejection of the load exists only in that section being discharged.

The successive order of collapse of the sections calls for locking the sections against relative movement and releasing them in order, so that there may be no relative movement except between the section being discharged and the remaining sections. The present invention provides means for the accomplishment of this function and the illustrated embodiment of such means consists of latch members 34 carried on opposite sides of each section (except the section next adjacent the tail section 20*a*) where they are pivotally mounted on the U-shaped member or frame of that section. The latch members are notched, as indicated at 35, adjacent the ends opposite the pivotal connections and these notches constitute seats in which the lugs 36 engage, the cooperating lug of each latch member being positioned on the U-shaped frame or member of the next adjacent rear section. Thus when the lugs 36 are engaged in the seats 35 of the associated latch members, the two sections carrying these two parts are locked against relative movement.

To provide for releasing the members and thus releasing the latched sections, as the whole are advanced toward the rear section, the members are provided with inclined noses 37 engageable with trip blocks 38, the trip block for any member being positioned on the frame of that section next to the rear of the section carrying the latch lug 36 for that member. But the trip blocks 38 also have an additional function which is to act as limiting stops in the extension of adjacent sections, each latch member having an abutment lug 39 engageable in the seat 40 formed in its associated block 38. Any pair of latch members 34 cooperate with the trip blocks 38 on the next adjacent rear section to that on which they are carried, in limiting the extensions of the section, but cooperate with the trip blocks on the section next to the rear of that when the tripping or releasing function is being performed.

The lugs 36 and blocks 38 on any section act as guides for the latch members of the next preceding section, and in order that the members may be insured engaging the lugs 36, they are provided on their upper edges with flat springs 41 which, in the extended positions of the sections, bear against the under sides of the blocks 38 and yieldingly impel the latch members towards the lugs 36 to insure depression of the members when

the notches 35 shall have registered with the lugs 36.

The head gate 33 is controlled with respect to the forward section, just as they are with respect to each other, its latch members 34 being mounted on a cross head 42 consisting of a U-shaped frame or member 25 and suitable bracing between it and the head gate. The bracing serves to impart the force applied to the U-shaped frame direct to the head gate and also serves as a spacer between it and the U-shaped frame, so that the head gate may be moved through the full extent of the forward section when the latch members of the head gate are released.

The actuating means for collapsing the sections consists of side chains 43 trained over rear sprockets 44 rotatably mounted on the U-shaped member 25 of the rear section 20*a*, these chains being also trained over forward sprockets 45 mounted on the ends of the counter-shaft 46 to which motion is communicated, as by a motor 47, through a conventional reducing gear 48. The motor 47 is suitably supported from the vehicle frame, as is also the counter shaft 46. The chains 43 are anchored, as at 49, to the lugs of the U-shaped member of the cross head 42, so that this will move as the chain moves, the direction depending on the direction of rotation of the sprockets 45. The motor is of the reversible order and movement may thus be communicated to the chains to advance the body sections to the rear, if they are extended, or to the front, if they are collapsed.

Since the section 20 next adjacent the rear section 20*a*, is intended to be the first section to move in the dumping operation, no latch members for that section are provided, but it is necessary to provide a limiting stop in the extending operation and this is in the form of an abutment 50 carried by the vehicle frame and engageable with a pendent stop 51 on the transverse portion of the U-shaped frame 25 of this section. The U-shaped member 25 of the rear section carries the blocks 52 on its legs to perform the tripping function for the latch members of the first body section to be released, which is the second of the movable sections.

To protect the latch members and their attendant parts, as well as to deflect the material into the body when being loaded, laterally inclined guard plates 53 are provided, these extending the full length of the body on either side, and being supported on standards 54 spaced uniformly along the frame and secured thereto.

Assuming the body to be in extended position, to have been loaded and the time to have arrived when it is desired to discharge the load. The tail gate 28 is opened the desired degree by the setting of the stepped latches 30, after which the expulsion of the load is in order. The motor 47 is then started, its direction of rotation being such that the lower runs of the chains 43 will move rearwardly. The several movable body sections will then be carried rearwardly, no relative movement between them being possible by reason of the engagement of the latch members with their respective lugs 36. Since there is no rigid connection between the rear section 20*a* and the next adjacent section, the latter is moved into the rear section and the contents of that section ejected through the tail gate opening. When this portion of the load shall have been fully expelled, the latch members 34 of the next adjacent section will have reached the trip blocks 52 which will result in disengaging them from their attendant lugs 36, so that the next adjacent section to the forward may be moved into the preceding section, ejecting the contents thereof. This sequence of operations continues, as the chains move, until the head gate is finally released when the contents of the front section are ejected by it, being forced through the front section, through the instrumentality of the cross-head with which the actuating chains are connected. Thus when the body is completely emptied of its contents, the several sections will all be in nested relation with their U-shaped frames in abutting relation.

The movement of the sections into extended position is effected by reversing the direction of rotation of the motor 47, consequently changing the direction of travel of the chains 43. It is of no consequence whether the sections be extended in successive order or not, but the forward movement of the lower runs of the chains will operate to apply a pulling force through their connections with the cross-head and the several sections including the head gate will be drawn out and latched in their extended positions as the lugs 39 on the latch members engage the seats in the trip blocks and the latch members are forced down by their springs to engage the notches 35 with the lugs 36.

In the modification illustrated in Figure 7, the turning of the edges of the trough members to provide scrapers is omitted and the scraping function secured through the employment of angles 55 attached on the outer surfaces of the trough members with the edges of their shorter legs disposed in scraping relation each with the inner surface of the trough member of the connected section. This construction provides a relatively wide space between the trough members of adjacent sections and the construction is employed therefor, at some sacrifice in capacity of the body but has the advantage that it reduces the likelihood of sticking of the sections, as there is less chance of them becoming jammed by the entrance of foreign matter, as might be the case where they are in close sliding relation.

In this modified construction, the stops

limiting the extended positions of the sections may be placed to engage the angles 55, such stops being in the form of blocks 56 disposed on the transverse portions of the U-shaped frames, of the sections for engagement each with the angle 55 of the companion section. The use of the stop blocks 56 avoids the necessity for forming the latch members with the lugs 39.

The invention having been described, what is claimed as new and useful is:—

1. A dumping body comprising a plurality of telescoping sections, and means for collapsing the sections in dumping a contained load, said means comprising operative connections between the sections to positively maintain extension of the same and automatic means to release said operative connections to positively effect collapsing of the sections in a predetermined order.

2. A dumping body comprising a plurality of telescoping sections, and means for collapsing the sections in dumping a contained load, said means comprising operative connections between the sections to positively maintain extension of the same and automatic means to release said operative connections to positively effect collapsing of the sections in succession.

3. A dumping body comprising a plurality of telescoping sections, means for collapsing the sections in dumping a contained load, and elements effecting substantially rigid connection between the sections but releasable by the sections themselves to effect collapsing of the sections in the order in which said elements are released.

4. A dumping body comprising a plurality of telescoping sections, means for collapsing the sections in dumping a contained load, and elements effecting substantially rigid connection between the sections but automatically releasable to effect collapsing of the sections in the order of release of said elements.

5. A dumping body comprising a plurality of telescoping collapsible sections, means for collapsing the sections in dumping a contained load, elements effecting substantially rigid connection between the sections, and means for automatically releasing said elements in progressive order to effect the progressive collapsing of the sections.

6. A dumping body comprising a plurality of telescopically related sections, latching means to maintain the extended relation of the sections, and means for collapsing the sections, the latching means being releasable by the sections themselves to insure the collapsing of the sections in the order of release of the latching means.

7. A dumping body comprising a plurality of telescopically related sections, latching means for maintaining the extended relation of the sections, means for collapsing the sections, and section actuated means for releasing the latching means in sequence to insure the corresponding collapse of the sections.

8. A dumping body comprising a plurality of telescopically related sections, latching means for maintaining the extended relation of the sections, means for collapsing the sections, and means for automatically releasing the latching means in sequence to insure the corresponding collapse of the sections.

9. A dumping body comprising a plurality of telescopically related sections, latching means for positively maintaining the extended relation of the sections, section actuated tripping means to release the latch means, and means for collapsing the sections.

10. A dumping body comprising a plurality of telescoping related sections, latch members for maintaining the extended relation of the sections, means for collapsing the sections, and section actuated means for releasing the latch members in a predetermined order to effect a corresponding collapsing of the sections.

11. A dumping body comprising a plurality of telescopically related sections of which one terminal section is anchored, elements for maintaining the extended relation of the remaining sections, means for advancing said remaining sections into the anchored section, and section actuated means for tripping said elements in an order to determine the order of advance of said remaining sections into the anchored section.

12. A dumping body comprising a plurality of telescopically related sections of which one terminal section is anchored, means for advancing the remaining sections into the anchored section, means for maintaining the extended relation of said remaining sections, and means for automatically releasing the last said means in successive order to correspondingly insure the advance of said remaining sections into the anchored section.

13. A dumping body comprising a plurality of telescopically related sections of which one terminal section is anchored, means for advancing the remaining sections into the anchored section, latch members pivotally mounted on some of the sections and engageable with lugs on adjacent sections for maintaing the extended relation of said sections, and means for tripping said latch members in successive order.

14. A dumping body comprising a plurality of telescopically related sections of which one terminal section is anchored, means for advancing the remaining sections into the anchored section, latch members pivotally mounted on some of the sections and engageable with lugs on adjacent sections for maintaining the extended relation of said sections, and automatic means for tripping said latch members in successive order.

15. A dumping body comprising a plurality of telescopically related sections of which one terminal section is anchored, means for advancing the remaining sections into the anchored section, latch members pivotally mounted on some of the sections and engageable with lugs on adjacent sections for maintaining the extended relation of said sections, and trip blocks carried by the sections and engageable with the latch members to release a succeeding section as each section enters the anchored section.

16. A dumping body comprising a plurality of telescopically related sections of which one terminal section is anchored, means for advancing the remaining sections into the anchored section, latch members pivotally mounted on some of the sections and engageable with lugs on adjacent sections for maintaining the extended relation of said sections, and trip blocks carried by the sections and engageable with the latch members to release a succeeding section as each section enters the anchored section, the latch members being provided with projections abutting the trip blocks to act as limiting stops in the extended positions of the sections.

17. A dumping body comprising a plurality of telescopically related sections of which one terminal section is anchored, a head gate movable of the forward section, latching means positively maintaining the extended relation of the remaining sections and the position of the head gate at the front end of the forward section, actuating means operatively connected with the head gate for advancing said remaining sections into the anchored section, and means for successively tripping the latch members to release the sections in order and to finally release the head gate.

In testimony whereof we affix our signatures.

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