April 30, 1935. T. C. HARVEY 1,999,837

DUMP WAGON

Original Filed Feb. 8, 1933 4 Sheets-Sheet 1

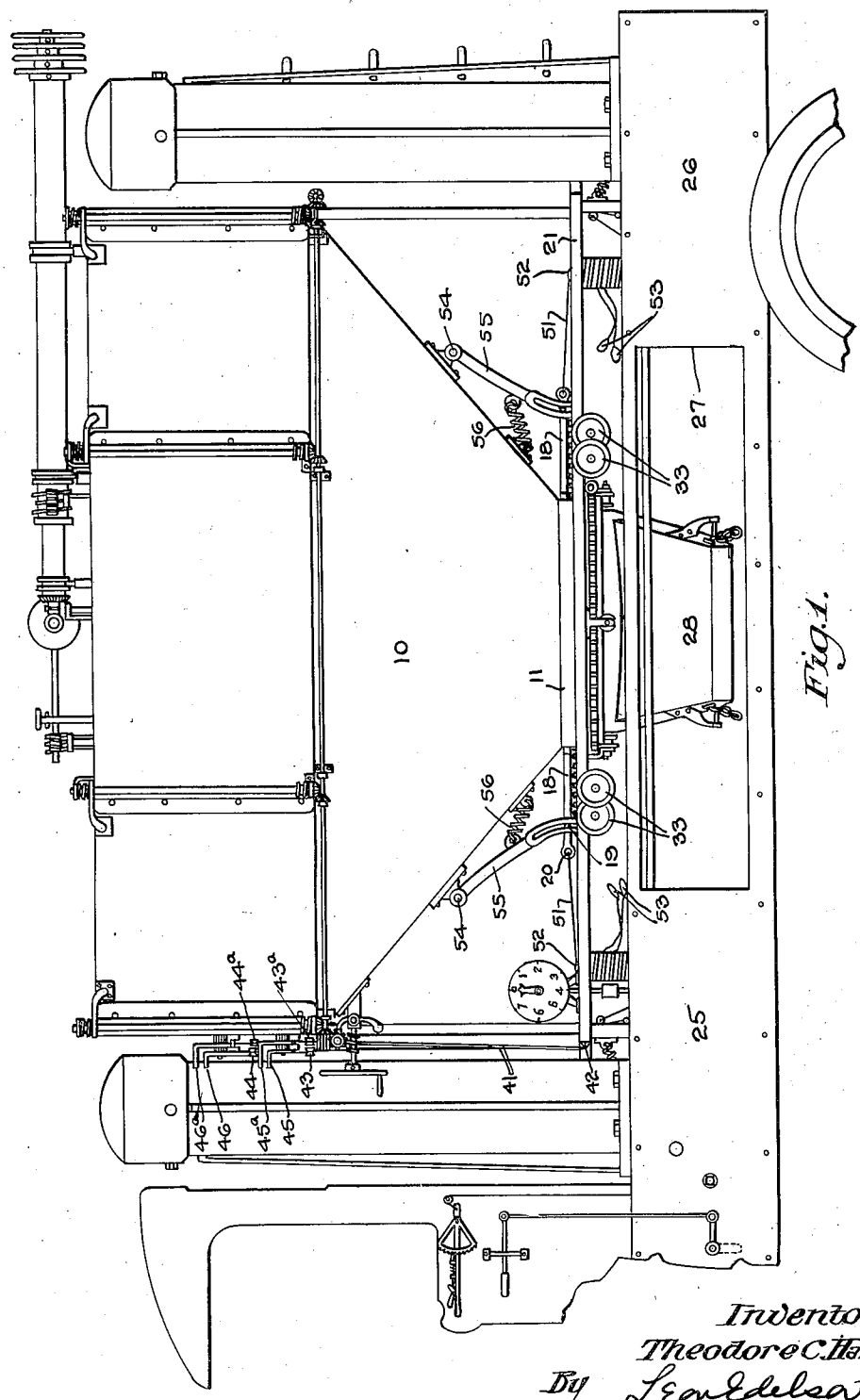


Fig. 1.

Inventor:
Theodore C. Harvey,
By Lee Edelsan
Attorney.

April 30, 1935. T. C. HARVEY 1,999,837

DUMP WAGON

Original Filed Feb. 8, 1933 4 Sheets-Sheet 2

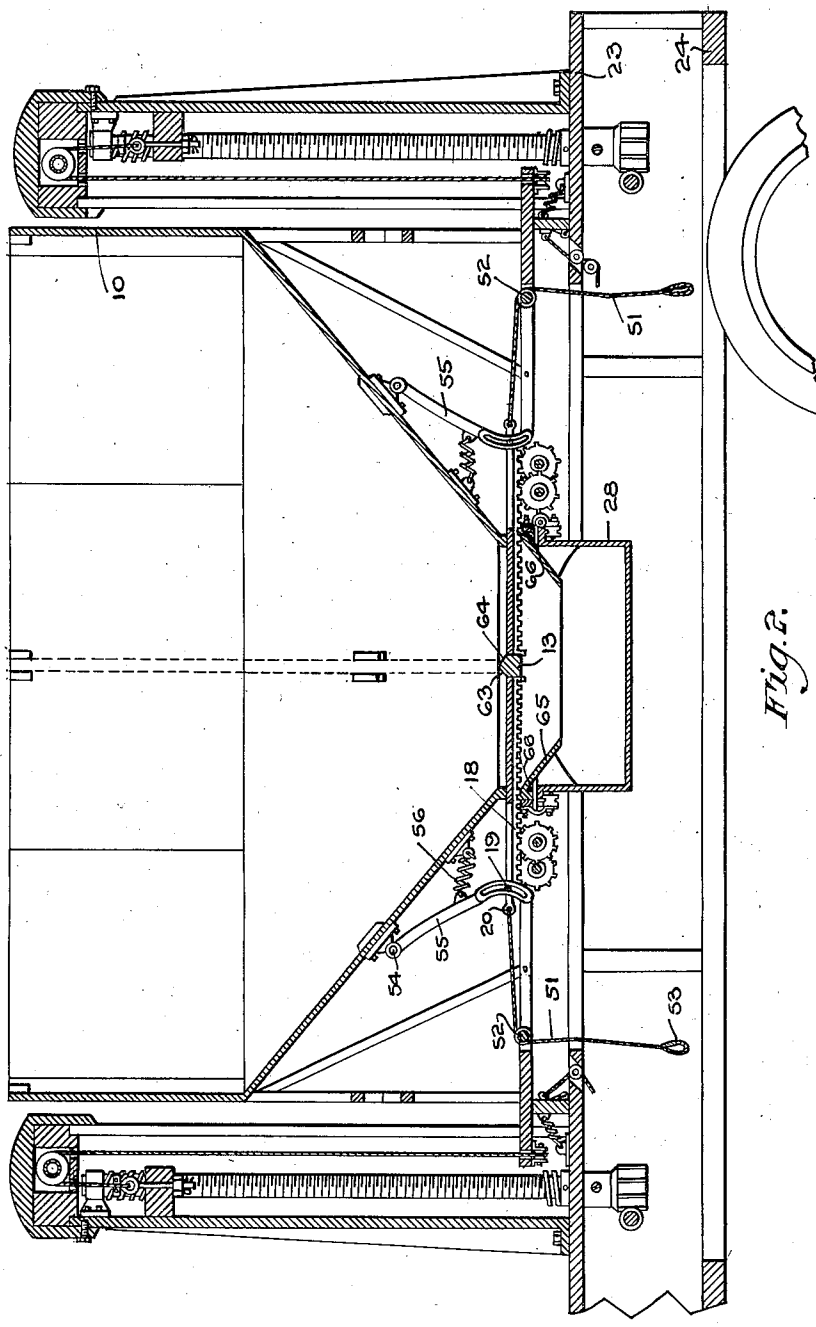


Fig. 2.

Inventor:
Theodore C. Harvey.
By Lee Edelson
Attorney.

April 30, 1935. T. C. HARVEY 1,999,837

DUMP WAGON

Original Filed Feb. 8, 1933 4 Sheets-Sheet 3

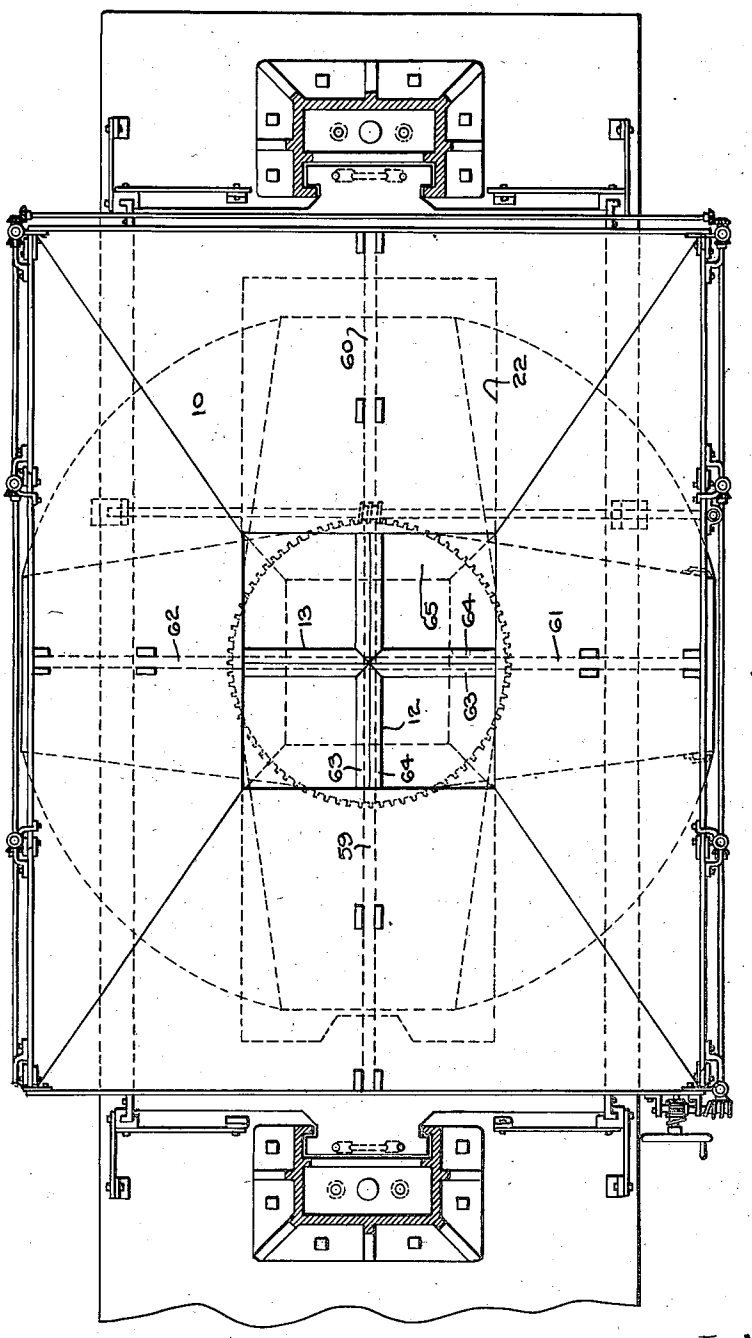


Fig. 3.

Inventor:
Theodore C. Harvey,
By Lear Edelson
Attorney.

April 30, 1935. T. C. HARVEY 1,999,837

DUMP WAGON

Original Filed Feb. 8, 1933 4 Sheets-Sheet 4

Fig. 4.

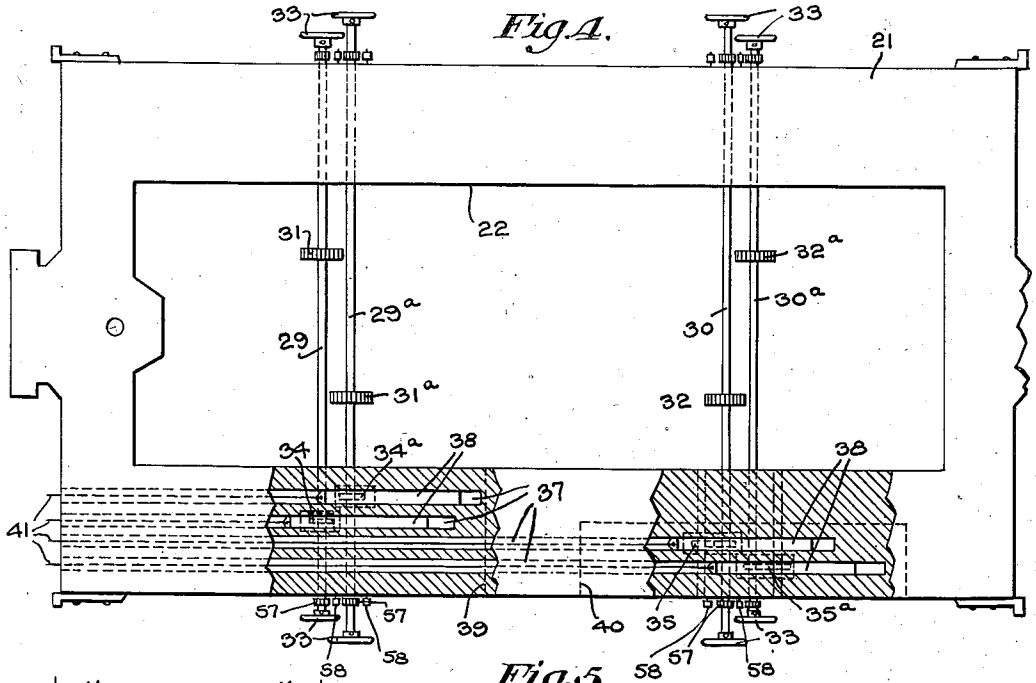


Fig. 5.

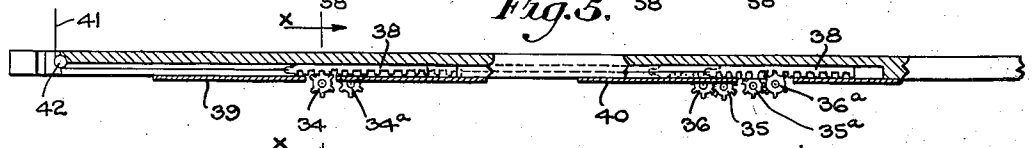


Fig. 6.

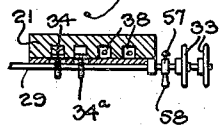


Fig. 7.

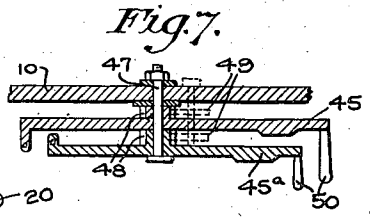


Fig. 8.

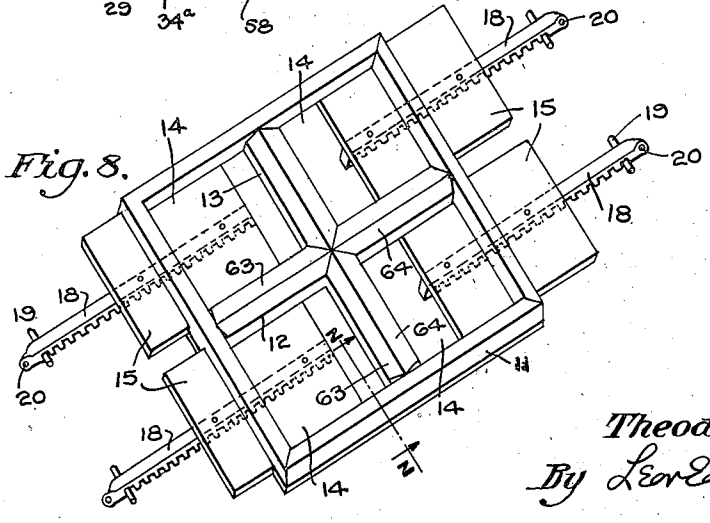
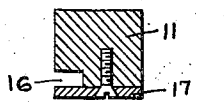


Fig. 9.



Inventor:
Theodore C. Harvey,
By Lee Edelson
Attorney.

Patented Apr. 30, 1935 1,999,837

UNITED STATES PATENT OFFICE

1,999,837

DUMP WAGON

Theodore C. Harvey, Philadelphia, Pa.

Original application February 8, 1933, Serial No. 655,744. Divided and this application June 6, 1934, Serial No. 729,223

1 Claim. (Cl. 298—27)

This is a divisional application of a co-pending application filed February 8, 1933, Serial No. 655,744, wherein the described invention relates generally to dump wagons, the broad object of which is to provide a wagon of the class described which is capable of various operations in order to expedite and facilitate the discharge of the load therefrom in a manner most convenient to the operator as well as minimizing traffic obstruction.

An object of the present invention is to provide a dump wagon having a bottom discharge and capable of being automatically emptied or unloaded, partially or wholly from either side of the wagon body.

Another object in view, is to provide for emptying the load partially or wholly from the bottom.

Another object in view, is to provide for directing the discharging load toward either side, bottom, front and rear or practically in almost any direction downwardly or inclined from the bottom discharge opening of the load body.

Another object in view, is to provide means operable either from the operator's compartment or the ground and whereby a plurality of outlets may be separately or simultaneously operated with the body in either elevated or lowered position.

Another object in view, is to provide means for the carriage of separate units or different materials and permitting separate or combined discharge of said load units.

With the above and other objects in view, the invention consists substantially in the combination, construction, location and relative arrangement of parts, all as will appear more fully hereinafter, as shown in the accompanying drawings and as finally pointed out in the appended claim.

In the accompanying drawings:—

Fig. 1 is a side elevational view of a dump wagon constructed in accordance with and embodying the principles of the present invention;

Fig. 2 is a vertical, longitudinal section through the dump wagon;

Fig. 3 is a plan view of the dump wagon embodying the present invention;

Fig. 4 is a top plan view, partly in section, of the foundation board;

Fig. 5 is a side or edge view of the foundation board, partly in section;

Fig. 6 is a transverse sectional view taken along the line x—x of Fig. 5;

Fig. 7 is a fragmentary horizontal sectional view showing the hand levers for operating the outlet trap doors;

Fig. 8 is a perspective view of the bottom trap door frame, showing a portion of the trap door operating means; and

Fig. 9 is an enlarged fragmentary cross sectional view on the line z—z of Fig. 8.

Referring now more particularly to the drawings, it will be observed that the wagon body or receptacle for the load as shown is of inverted frusto-pyramidal shape. While this is the preferable shape, it will be understood that the invention or inventions to be described more fully hereinafter are equally applicable to bodies or load receptacles of different shapes than that shown in the drawings, the principal characteristic of the body with which this invention is concerned being that the side walls thereof converge downwardly toward an opening in the bottom of the body. In the drawings the load receiving body is designated generally by the reference numeral 10, the centrally disposed bottom opening or outlet having suitably secured to the perimetral edge thereof a frame member 11, this frame member being more particularly shown in Figure 8. As clearly appears in this latter figure the frame member 11 is provided with intersecting division strips 12 and 13 whereby to provide a plurality of substantially equal-sized openings 14, each of which constitutes, when the frame 11 is attached to the bottom of the load receptacle 10, a discharge outlet. It will be apparent that by the provision of the four discharge outlets, the material contained in the body may be discharged through any one or more of the said discharge outlets.

As appears most clearly in Figures 2 and 8, each of the discharge outlets 14 thus provided in the bottom of the body is adapted to be opened and closed by a horizontally arranged slidable closure member 15, these closure members 15 being all movable in directions extending longitudinally of the main body 10. As appears most clearly in Fig. 9, the closure members 15 are respectively slidable within opposed longitudinally extending rabbets 16 formed in the inner bottom edges of the longitudinally extending side bars of the frame 11 as well as in the opposite bottom edges of the longitudinally extending division strip 12 of said frame, the closure members 15 being respectively retained in slidable position by means of the flat supporting strips 17 which are secured in underlying relation to the bottom surfaces of the longitudinally extending side bars and the longitudinally extending division strip 12 of the frame 11. Fixedly secured to each of the closure members 15 is a longitudinally extending rack bar

18 the toothed edge of which is presented downwardly and the outer free end of which is provided with a laterally extending pin 19 and a terminal eye 20 for purposes which will be apparent hereinafter.

As appears most clearly in Figures 1 and 5, the main body 10 rests upon and is directly supported by a foundation board or platform 21 having formed therein an elongated central opening 22. This platform 21 is adapted for vertical movement together with the main body 10 supported thereby by the means disclosed and described in detail in the aforesaid co-pending application. The platform 21 is, of course, disposed in a substantially horizontal plane above the vehicle frame, the latter comprising an upper frame member 23 and a lower frame member 24. The fore and aft ends of the truck frame are preferably in the form of partially boxed-in sections having the substantially closed side walls 25 and 26, said sections being of such character as to provide an intervening section the opposite side walls of which are open, as at 27. Disposed within the intervening section and suitably secured to the bottom end of the main body 10 is a revoluble discharge chute 28, the truck frame members 23 and 24 being vertically spaced apart a distance sufficient to allow for the desired vertical and rotative movement of the discharge chute 28.

The upper and lower frame members 23 and 24 are respectively of substantially rectangular formation, thus affording openings therein of sufficient size to permit not only a vertical movement of the discharge chute 28 but also a circular movement thereof when the body 10 is in lower position, the openings 27 in the side walls of the intervening section of the truck frame being of sufficient length and depth as to permit the free movement therethrough of the outer end of the discharge chute. Preferably, the free end of the discharge chute extends somewhat beyond the side limit of the vehicle frame when the chute is directed into position for discharging the load from the side of the vehicle, thereby facilitating the filling of receptacles from either side of the vehicle when the main body 10 is in its lowered position. At the same time, by so arranging the discharge chute that its outer end extends through the opening 27 of the vehicle frame, the attachment of an extension chute, (not shown) is greatly facilitated. The means for effecting the rotation of the discharge chute 28 is not described in detail herein, although it is so described in my copending application aforesaid to which reference is herein made.

Referring now more particularly to Figures 1, 2, 4 and 5, it will be observed that the mechanism for operating the bottom trap doors 15 includes a forward pair of transversely extending shafts 29 and 29*a* and a rearward pair of transversely extending shafts 30 and 30*a*, each of said shafts being suitably journalled upon the bottom surface of the foundation board or platform 21. The shafts 29 and 29*a* respectively have fixed thereto the pinions 31 and 31*a*, while the shafts 30 and 30*a* have respectively fixed thereto the pinions 32 and 32*a*, it being observed that the pinions 31, 31*a*, 32 and 32*a* are relatively so located that they respectively engage the longitudinally extending rack bars 18 which are respectively secured to the several trap doors 15 (see Figure 8). Secured to the outer extremities of the transversely extending shaft 29 are a pair of hand wheels 33, the transversely extending shafts 29*a*, 30 and 30*a* being similarly provided at their opposite extremities with hand wheels. It will be apparent that by virture of these hand-operated transversely extending shafts and the four sets of hand wheels arranged to either side of the vehicle the opening or closing of any one of the trap doors by an operator stationed at either side of the vehicle is facilitated.

In addition to the pinions 31, 31*a*, 32 and 32*a*, the several transversely extending shafts are respectively additionally provided with the pinions 34, 34*a*, 35 and 35*a* (see Figures 4 and 5), the pinions 35 and 35*a* being respectively in toothed engagement with the reverse motion pinions 36 and 36*a*. Slidable within suitably formed grooves 37 formed in the bottom surface of the foundation board or platform 21 are the longitudinally slidable rack bars 38, these rack bars being held in position against vertical displacement from their respective grooves 37 by means of the cover plates 39 and 40. The several rack bars are respectively in mesh with the pinions 34, 34*a*, 36 and 36*a*.

Connected to the forward extremity of each of the rack bars 38 is a cable 41, it being observed that four such cables are necessarily required, the portions of the cable which extend longitudinally of the foundation board 21 (see Figure 4) being arranged in laterally spaced parallel relation. As appears most clearly in Figures 1 and 5, the cables 41 respectively pass around a plurality of pulleys 42 which are journalled upon the forward edge of the foundation board or platform 21 and thence extend upwardly and over the pulleys 43, 43*a*, 44 and 44*a*, the free ends of the cables being finally secured to the terminal ends of a plurality of hand-operated levers 45, 45*a*, 46 and 46*a*. Preferably, the last-mentioned end levers are arranged in pairs, the levers 45 and 45*a* constituting one pair, being mounted upon a short stub shaft 47 (as see Figure 7) which is suitably secured to for projection forwardly from the front face of the main body 10. The hand levers 46 and 46*a*, constituting the second pair, are similarly mounted upon a stub shaft which is preferably located vertically above the first-mentioned stub shaft.

As appears most clearly in Figure 7, each of the hand-operated levers 45, 45*a*, 46 and 46*a* is provided with a ratchet wheel 48, these ratchet wheels being adapted for respective engagement by the detents 49, it being understood, of course, that any suitable means or the like may be provided for normally maintaining said detents out of engagement with their respective ratchet wheels. As appears most clearly in Figures 1 and 7, it will be observed that each of the hand-operated levers is provided with a hand grip 50 and that the arms of the levers 45 and 46 are respectively shorter than the corresponding arms of the levers 45*a* and 46*a*. This enables the operator to operate the levers independently of one another or simultaneously. The hand grips 50 of the lower pair of hand levers are adapted to be commonly grasped by one hand of the operator while the hand grips of the upper pair of hand levers are adapted to be commonly grasped by the other hand of the operator, thereby making it possible to operate all of the levers in unison whereby to open or close all of the trap doors in unison. Or, if desired, the several hand levers may be operated selectively, either individually or in pairs, to open or close any one or more of the trap doors 15 in the bottom of the main body 10.

And it will be apparent, of course, that the

opening or closing of these trap doors may be effected by the operator of the vehicle without leaving the driver's compartment through the medium of the hand-operated levers 45, 45a, 46 and 46a. If, however, the operator is standing on the ground upon one side or the other of the vehicle, the trap doors may be selectively opened or closed by operating one or the other of the hand wheels 33. As appears most clearly in Figure 7, the hand-operated levers are preferably weighted adjacent the grip ends thereof whereby to take up the cable slack when the bottom trap doors are opened or closed by means of the hand wheels 33.

Still another means is provided for opening and closing the bottom trap doors 15, this latter means including a plurality of flexible cables 51 which are respectively terminally attached to the eyes 20 of the rack bars 18, the cables 51 being respectively passed over the pulleys 52 which are journalled in the foundation board or platform 21, the free ends of the several cables 51 being looped, as at 53, to provide hand grips by means of which the operator, standing upon the ground, may pull one or the other of the several cables 51 to open the desired trap door or doors 15 (see more particularly Figure 2).

As appears most clearly in Figures 1 and 2, the main body 10 has pivotally mounted at opposite sides thereof, as at 54, a pair of laterally spaced thrust arms 55, one such arm being provided for each cable 51. Each of the thrust arms 55 terminates in arcuately curved portions having an arcuated slot within which is adapted to be projected the pin 19 of the rack bar 18. A contractile spring 56 connects each thrust arm with a point with the main body 10, these springs serving normally to pull the several thrust arms 55 toward the body and in so doing causes the trap doors 15 to be respectively moved into closed position, this latter action being effected through the slot and pin connection between each thrust arm 55 and its associated rack bar 18.

It will be understood, of course, that as the trap doors 15 are pulled into open position by means of the cables 51, the transversely extending shafts 29, 29a, 30 and 30a (see Figure 4) will be correspondingly rotated, this being due to the fact that these shafts are respectively geared to the rack bars 18 of the trap doors 15. In order to positively maintain the doors 15 in open position for a considerable period of time, as when the entire load in the main body is to be discharged in a single operation, the said transverse shafts 29, 29a, 30 and 30a are respectively provided adjacent one or both ends of each thereof with a suitable ratchet and pawl device, the ratchet wheels being designated by the reference numeral 57 and the pawls or detents by the reference numerals 58 in Figure 4.

It is preferable to provide some means for subdividing the main body 10 into a plurality of individual compartments and to this end there is provided a pair of vertical sections 59 and 60 and a second pair of vertical sections 61 and 62, these vertical sections being so arranged that when properly positioned within the main body 10 they constitute in effect a longitudinally extending partition which is intersected substantially at right angles by a transversely extending partition, the longitudinally extending partition being disposed substantially in the plane of the division strip 12 of the bottom frame 11 and the transversely extending partition being disposed substantially in the plane of the transversely extending division strip 13 of the bottom frame 11. There is thus provided four compartments which are respectively provided with the discharge openings 14 (see Figure 8), each of which openings is provided with its own individually operated trap door 15, as already described. The four compartments so provided are thus adapted to be filled with different materials for individual or selective discharge through their respective discharge openings or the four compartments may be filled with material adapted to be discharged in one operation by simultaneously opening all of the trap doors 15. Preferably, the upper edges of the division strips 12 and 13 of the frame 11 surrounding the bottom opening in the main body 10 are grooved or slotted longitudinally thereof to snugly accommodate the bottom edges of the division wall sections 59 to 62.

As appears most clearly in Figures 2 and 8, the intersecting division strips 12 and 13 of the frame 11 are each provided with upwardly converging opposed surfaces 63 and 64, the grooves within which the division wall sections 59 to 62 aforesaid are respectively accommodated being provided substantially in the ridges of the so tapered division strips. This construction affords a joint between each vertical wall section and its supporting division strip which is free of sharp corners and so facilitates the free and complete discharge of even the smallest size particles through the bottom openings of the body of the vehicle.

In order to conserve space and prevent spilling of the load in connection with the use of the revoluble chutes discharge 23 as well as to afford a means for directing the discharge of the material from any one or more of the openings 14 toward a common or concentrating point, a demountable frame 65 is employed (see Figures 2 and 3), this frame being provided with sloping side walls which converge downwardly to form a bottom opening disposed substantially in a horizontal plane lying below the common plane of the discharge openings 14. This frame 65 substantially encompasses the four discharge openings 14 and is secured in position to cross pieces within the foundation board or platform 21 by means of bolts 66. The frame 65 serves in effect as a funnel the enlarged upper extremity of which is adapted to collect the material as it is discharged from any one or more of the openings 14, the material being then discharged through the restricted bottom outlet thereof without any loss due to spilling.

From the foregoing description, when considered in connection with the accompanying drawings, it will be observed that a vehicle has been produced in which the outlet trap doors in the bottom of the main body are adapted to be operated from the seat selectively and individually, or in pairs, or they may be all operated simultaneously. Furthermore, these trap doors may be operated from the ground and with the body in either elevated or lowered position. The division wall sections which sub-divide the main body into a plurality of separate and independent compartments allow for single or multiple delivery at the same time that they provide a very effective means for stabilization of a part load in order to afford safer transit over rough roads.

It will be understood, of course, that the invention is susceptible of various changes and modifications which may be made from time to time without departing from the real spirit or general principles thereof and it is accordingly intended

to claim the same broadly, as well as specifically, as indicated in the appended claim.

What is claimed as new and useful is:—

A dump wagon of the character described comprising, in combination, a main load receiving body having a downwardly converging section terminating in the horizontally disposed bottom discharge opening, said body being partitioned interiorly thereof to provide a plurality of separate and independent compartments, each of said compartments being adapted to discharge the load contained therein through said bottom discharge opening, the latter having secured to its marginal edge a frame having intersecting division strips respectively defining separated discharge outlets communicating with said compartments, said division strips being beveled or tapered in their upper surfaces to facilitate the discharge of the material from said compartments through their respective discharge outlets, and a funnel-shaped discharge member disposed beneath said bottom discharge opening and encompassing all of the said separated discharge outlets for collecting the material discharged through any one or more of the said outlets and directing the discharge material in a concentrated stream to a point located substantially and centrally beneath said bottom discharge opening of the load receiving body.

THEODORE C. HARVEY.