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J. F. HEIL ET AL

2,406,015

REFUSE BODY

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2 Sheets-Sheet 1

Fig. 1.

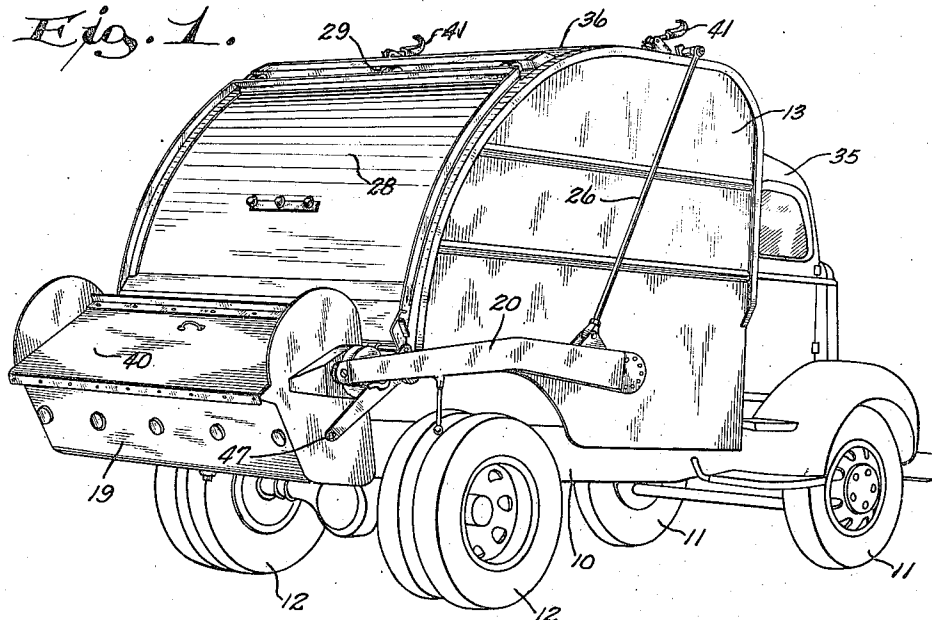
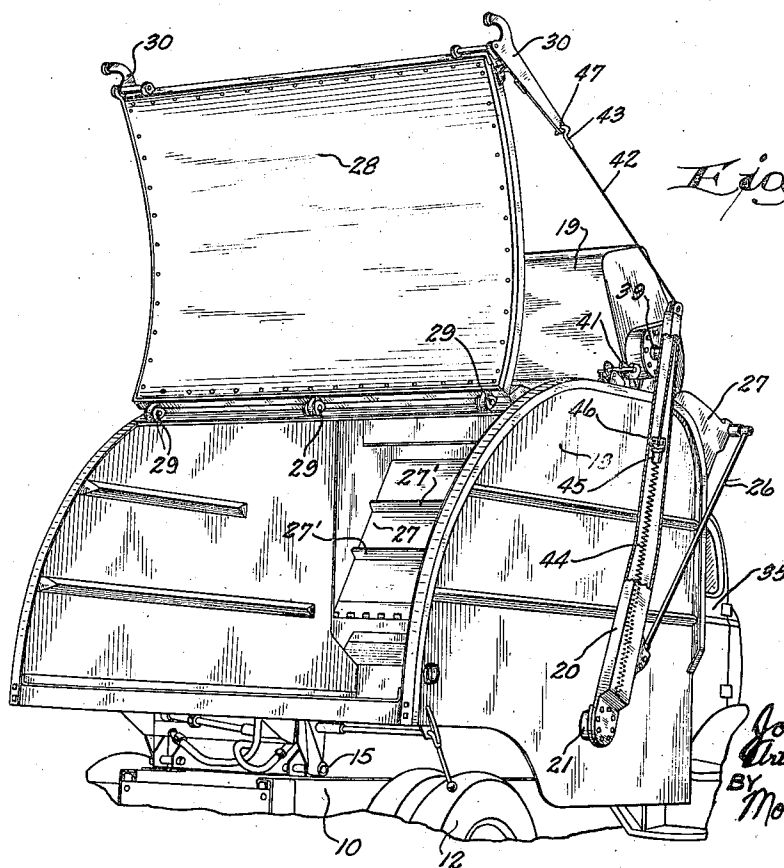


Fig. 2.



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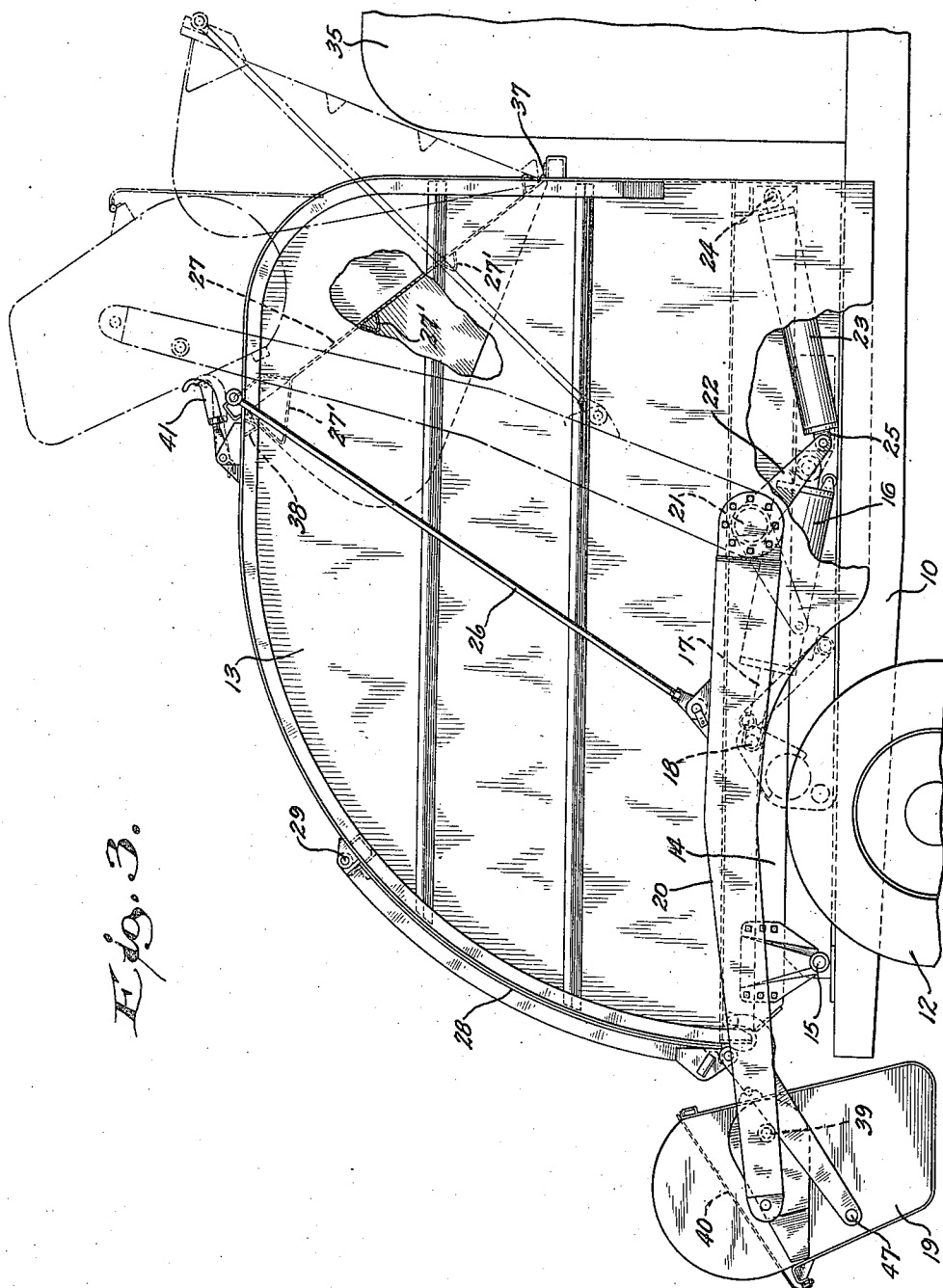


Fig. 3.

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REFUSE BODY

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15 Claims. (Cl. 214—67)

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This invention relates to improvements in refuse bodies and more particularly to a vehicular refuse collecting body having mechanically operated means for facilitating the loading and unloading thereof.

A general object of the invention is to provide various improvements in the details of construction of bulk material carried vehicular bodies, whereby such bodies may be efficiently, automatically loaded or unloaded.

Refuse, garbage and rubbish ordinarily picked up in street collection service is of a loose uncompacted nature and when such material is deposited in a collection vehicle the uncompacted bulk material will rapidly fill up the vehicle body and prevent the entry of more refuse long before the prescribed body load in weight is attained. This difficulty can be overcome by compacting the refuse whereby the vehicle body may be more effectively and efficiently filled and the capacity thereof is greatly increased.

With the above in mind it is, therefore, a primary object of the present invention to provide in a refuse body equipped with mechanical loading mechanism, improved means operating automatically to pack and compress bulk refuse as it piles up in the body during loading operations.

A further object of the invention is to provide in a refuse body equipped with a swingable arm-carried loading bucket, a packing panel or plate connected to the bucket-carrying arms to be automatically operated thereby, whereby movements of said packing panel into and out of operative position are coordinated with loading and return movements of the bucket.

A further object of the invention is to provide, in a mechanically loading refuse body, a powered refuse pushing or packing panel which also serves as a controlled closure member or cover for the loading opening in the refuse body.

A further object of the invention is to provide, in a mechanically loading refuse body, a combination refuse pushing panel and loading opening cover so associated with the operating mechanism that when the loading bucket is swung to load depositing position said panel is simultaneously moved to open position relative to the body loading opening, and when the loading bucket is swung to its lowered position said panel is simultaneously moved to its load packing position wherein it also closes the body loading opening.

A further object of the invention is to provide, in a mechanically loading refuse body, a charge conveying bucket equipped with a movably

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mounted cover arranged to gravitate to open position when the bucket is in its raised, tilted, charge depositing position.

A further object of the invention is to provide a mechanically loading refuse body having a power packer or pusher plate operatively associated with the bucket swinging arms and movable from exteriorly of the body into an internally projecting position, the connections between said plate and the bucket operating arms being entirely external of the refuse body and eliminating the need for slots or additional openings in the body walls.

A further object of the invention is to provide, in a mechanically loading refuse body including a swingable loading bucket and arms carrying the same and a hinged tail gate for the body having operating cables, springs housed in said bucket arms for normally maintaining the tail gate cables in a retrieved, non-dangling condition.

A further object of the invention is to provide a refuse body which is of very simple construction, which has a large capacity for bulk refuse and which will store the same for transportation in a covered, sanitary condition, which is efficient and automatic in operation, which is attractive in appearance, and which is well adapted for the purposes described.

With the above and other objects in view the invention consists of the improved refuse body, and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawings in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a rear and side perspective view of an improved refuse body mounted on a motor truck, and with the loading bucket in its lowered position and the rear end gate locked;

Fig. 2 is a rear and side perspective view of the refuse body with the loading bucket in its raised position, the tail gate operating cables engaged with the tail gate, and the latter in open position; and

Fig. 3 is a side view of the refuse body with the loading bucket in lowered position, there being a broken line showing of the loading bucket in raised position with the refuse pushing panel in its open, outer position, portions of the refuse body being broken away and in section.

While the invention has been shown and described herein as being specifically embodied in a particular type of refuse body tiltably mounted upon the rear of an ordinary motor-driven truck, and having a particular style of loading bucket

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associated therewith, it is not the intent to thereby unnecessarily restrict the scope of the present invention.

The improved refuse body and truck assemblage, shown in the drawings, comprises in general, a relatively standard transporting truck or motor vehicle having a chassis 10 mounted on front and rear wheels 11 and 12 respectively. A load-carrying hollow body 13 is secured to a sub-frame 14 which is tiltably connected to the rear end of the chassis 10 above the wheels 12 by a transverse pivot member 15. To tiltably move the body for unloading purposes there is a main hydraulic hoist or jack having a cylinder 16 secured by trunnions to the chassis 10 with a piston 17 slidable within the cylinder 16 and connected by a pivot pin 18 to a sub-frame lifting link. A loading bucket 19 is tiltably supported by side arms 20 secured to a transverse pivot shaft 21 journaled through the lower portion of the body 13 and having associated rigidly attached lever arms 22 which are engaged by the pistons 25 operating in the cylinders 23 of auxiliary hydraulic jacks or rams, said jacks or rams being movably connected to the body by pivots 24. The inner ends of elongated connecting rods 26 are attached to lower portions of the arms 20. Said rods 26 traverse the outer side portions of the body 13 and their upper ends, terminating adjacent the top portion of the body 13, are pivotally affixed to a combination closure member and refuse pusher or packer plate 27 whose outer wall, when the plate or panel 27 is in its lowered position, lodges within and closes a loading opening in the top of the body 13. A rear end gate 28 is swingably suspended from the body 13 by means of hinged connections 29 and the lower free edge of said tail gate 28 pivotally carries latching hooks 30.

The hollow load-carrying body 13 may be formed of sheet metal and extends from the rear of the truck cab 35 to a point somewhat beyond the rear end of the chassis 10, and also extends outwardly beyond the rear wheels 12 so as to provide for maximum capacity. The front wall of the body 13 is preferably disposed, in normal position, approximately vertically, while upright side walls of the body 13 are curved along their tops and rear edges, and also somewhat along the upper portion of the front edge, and said side walls are rigidly interconnected on the top side of the body by a curved transverse plate 36 in which the upper loading opening is formed and which terminates substantially forwardly of the upper edge of the rear discharge opening. From Fig. 3 it will be apparent that said loading opening extends from the line of hinged connection 37 for the plate or panel 27 on the front wall of the body, to the transverse rib 38 which acts as a stop for the front edge of said panel 27 when the latter is in its lowered position.

The loading bucket 19 is shaped, as is best shown in Fig. 1, and is swingably suspended from the outer ends of the long bucket operating arms 20 by pivotal connections 39. When the arms are in the lowered positions of Figs. 1 and 3, the mounting of the bucket and the weight thereof is such as to cause the bucket to maintain the position shown. The open upper end of the bucket, between the extended wings of the end plates, is normally closed by a hinged cover 40 which may be manually opened by attendants to dump refuse into the bucket. The hinged connection for the cover 40 is along the rear edge of the cover. The arms 20, which are operated by the pistons 25 of

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the auxiliary jacks, through the levers 22, are adapted to be swung from the full line position of Fig. 3 to the broken line position shown therein and vice versa. By means of the pivotally connected operating rods 26, attached to the hinged panel 27, when the arms 20 move in an arc upwardly, the panel is hingedly moved from the closing position, shown in Fig. 3, to the open position shown in broken lines, thereby exposing the loading opening in the upper end of the body 13. When the bucket approaches a position adjacent the top of the body, projections on the bucket are cooperable with dogs 41 carried by the body to tilt the bucket to the inverted load-discharging position shown in broken lines in Fig. 3, wherein the open end of the bucket registers with the loading opening in the body and material may gravitate from the bucket into the body. It will be observed that the packing and covering panel 27 is formed with side wings which register with the tilted bucket and guard against material falling free of the loading opening. It will also be observed that the cover 40 for the bucket 19 is so mounted and weighted that when the bucket is tilted, as in the broken line position of Fig. 3, the cover 40 will gravitate to an open position.

The plate or panel 27 which serves as a closure for the body loading opening and also as a material pusher or packer, besides having the flat outer sheet portion and projected side wings, is formed with inwardly projecting transverse ribs 27' which are of utility in the material packing and pushing function of the panel when in its inner position. After material has been deposited from the elevated, tilted bucket 29 into the body through the loading opening, the auxiliary jacks are operated to lower the arms 20 and return the bucket to the lowered position illustrated. During this return movement the operating rods 26 become effective to move the panel 27 from the broken line position of Fig. 3 to the inner full line position. Should material have accumulated within the body, the movement of the panel into its lowered closing position is effective to push and compress the loose bulk material to increase the capacity of the body.

When the body 13 is in its normal, lowered load-receiving position, the tail gate 28 should be tightly sealed and the pivotal latch hooks 30 are provided for this purpose. As previously indicated, said tail gate is swingably suspended from hinge member 29 and the lower end of the body is provided with lugs or projections with which the hooks 30 are cooperable, as shown in Figs. 1 and 3. While the latch hooks 30 may be released from their engaging locking positions manually, they may also be automatically released, together with automatic lifting of the tail gate through operation of the arms 20. This is accomplished by the utilization of cables 42 carrying hooks 43 on their free outer end portions (see Fig. 2). The arms 20 are hollow and each has the inner end portion of an elongated coiled spring 44 anchored within an inner end portion. The other extremity of a spring 44 carries a protuberance 45 to which is affixed an inner end of a cable 42, the latter being slidably passed through a stop lug 46 rigidly mounted within a portion of the arm 20. When the cable 42 is not in use the spring 44 contracts and acts as a means to retrieve the cable to hold the outer end of the same compactly against the outer end of the arm 20. When the cable 42 is to be utilized for tail gate operating purposes it is extended relative to its arm 20, thereby expanding

the spring 44 until the protuberance 45 contacts the stop lug 46. With a cable thus extended, the hook 43 on the outer end thereof may be hooked into an aperture 47 in the end of the pivotal latch hook 30. Thereafter, when the arms 20 are swung upwardly, the pull imposed by the cables 42 will first pivot the hooks 39 to unlock the same and thereafter the attached cables 42 will pull the tail gate 28 to its open position, as in Fig. 2.

The tail gate is usually opened when it is desired to unload or dump out the contents of the body 13 and for the latter purpose, after the tail gate has been opened, the main hydraulic jack is operated to cause its piston 17 to tilt the body relative to the chassis on the transverse pivot 15. Upon return of the body 13 to normal position, and when the bucket 19 is lowered, the hooks 43 may be disengaged from the latching members 30 and the springs 44 will automatically retrieve the cables relative to the arms 20. The latching members 30 may be manipulated to locking position to then hold the tail gate closed.

All of the hydraulic jacks may be supplied with liquid, such as oil, under pressure from a supply reservoir by connections common in the art. In the hydraulic system, as is common, is included a pump adapted to be driven by the propelling motor of the truck.

During the normal use of the improved refuse loading and transporting assemblage, the body 13 will be in the lowered position, shown in Figs. 1 and 3. The loading bucket 19 is then in its lowermost position ready to receive bulk refuse which may be disposed therein by attendants standing on the ground rearwardly of the truck. When the bucket 19 has been filled to capacity, the arms 20 are operated to then swing the bucket upwardly to the broken line position of Fig. 3 wherein the action is, as previously described, with the panel 27 being automatically and simultaneously moved to open position and the bucket being tilted to deposit its contents into the body 13. Thereafter the arms are operated to lower the bucket for receiving subsequent batches of material which are successively introduced into the body until the same is completely loaded. During each downward movement of the arms 20 to return the bucket, the panel 27 is automatically moved to the full line position of Fig. 3, and if the material in the body has accumulated, the panel will serve to push it downwardly and distribute it in the body and to pack and compress it.

When the body 13 is thus efficiently filled, the load may be transported to any suitable destination and subsequently dumped in the manner previously described, wherein the cables 42 may be utilized for releasing the locking members 30 and opening the tail gate 28 through operation of the swingable arms 20 in the manner shown in Fig. 2.

From the foregoing description, it will be apparent that the present invention provides an improved refuse body assemblage which is simple, compact and durable in construction; which is safe and efficient and mechanical in operation; and which insures the filling of the body with a maximum load of compressed and distributed bulk material. The panel 27, in its connections with the bucket-operating arms 20, is operated jointly with the bucket and serves the dual purpose of providing an automatically operated closure for the loading opening of the body, and as a power material pusher or packer. The main

ram is utilized for tilting the body and the auxiliary rams or jacks actuate the operating arms 20 for the bucket and panel and this provides for the efficient application of power with the actuation of the members requiring a minimum force. The tail gate locking members 30 may be manipulated automatically and the power of the arms 20 may be utilized for opening the tail gate 28 through the cables 42. The retrieving means for said cables, housed within the arms 20, provides an effective arrangement which keeps the cable confined and out of the way when not in use. The mechanism can be readily manipulated by a single attendant in the driver's cab of the truck and power is obtained from the same prime mover which normally drives the truck.

The improved refuse body is furthermore of novel construction and is well adapted for the purposes described.

What is claimed as the invention is:

1. In a refuse truck body having an upper, forward loading opening therein, a refuse receiving bucket normally adjacent the lower rear portion of said body, power means for elevating said bucket and manipulating it so as to dump its contents into the body through said loading opening, a combination closure and material packing panel, and direct, positive connections between said panel and said bucket elevating power means for moving said panel into and out of the body relative to said loading opening.

2. In a refuse truck body having an upper loading opening therein, a refuse receiving bucket normally adjacent the lower portion of said body, power means for elevating said bucket and manipulating it so as to dump its contents into the body through said loading opening and to lower the bucket, a combination closure and material packing panel, hingedly mounted on the body to move through said loading opening into and out of said body, and direct, positive connections between said panel and said bucket elevating power means for positively moving said panel jointly with movements of said bucket in both directions and in relation to bucket movements.

3. In a refuse truck body having an upper loading opening therein, a refuse receiving bucket normally adjacent the lower portion of said body, power means for elevating said bucket and manipulating it so as to dump its contents into the body through said loading opening, a combination closure and material packing panel, hingedly mounted on the body to move through said loading opening into and out of said body, and rods pivotally connected directly between said panel and said bucket elevating power means to positively move the panel.

4. In a refuse truck body having an upper loading opening therein, arms pivotally mounted on the body, a refuse bucket movably mounted on said arms and normally disposed adjacent the lower portion of said body, power means for swinging said arms in an arc to carry the bucket from its normal position to said loading opening and return, a combination closure and material pushing panel hingedly mounted on the body to move through said loading opening into and out of said body, and rods pivotally connected directly between said panel and said arms.

5. In a refuse truck body having an upper loading opening therein, arms pivotally mounted externally on the body, a refuse bucket movably mounted on said arms and normally disposed adjacent the lower portion of said body, an hydraulic jack for swinging said arms to carry the

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bucket from its normal position to said loading opening and return, a combination closure and material pushing panel hingedly mounted on the body to move through said loading opening into and out of said body, and rods pivotally connected directly between said panel and said arms to transmit motion from the latter to the former upon movement of the arms in either direction.

6. In a refuse truck having an upper loading opening therein, arms having their inner ends externally pivotally mounted on side portions of the body, a refuse bucket movably mounted on the outer ends of said arms and normally disposed adjacent the lower rear portion of said body, power means for swinging said arms to move the bucket from its normal lowered position to a dumping position in registration with said loading opening and vice versa, a combination closure and material packing panel hingedly mounted on the body to move through said loading opening into and out of said body, and rods adjacent the outer side portions of the body and directly connecting said panel to said arms to transmit motion from the latter to the former upon movement of the arms in either direction.

7. In a refuse truck having an upper loading opening therein, arms having their inner ends externally pivotally mounted on side portions of the body, an open-ended refuse bucket movably mounted on the outer ends of said arms and normally disposed adjacent the lower rear portion of said body in a substantially upright position, power means for swinging said arms to move the bucket from its normal lowered position to a position adjacent said loading opening and vice versa, cooperating means on the body and bucket effective upon a predetermined movement of said arms to invert the bucket to cause it to dump its contents into the body through said loading opening, a combination closure and material packing panel hingedly mounted on the body to move through said loading opening into and out of said body, and rods adjacent the outer side portions of the body and directly connecting said panel to said arms to transmit motion from the latter to the former upon movement of the arms in either direction.

8. In a refuse truck having an upper loading opening therein, arms having their inner ends externally pivotally mounted on side portions of the body, an open-ended refuse bucket movably mounted on the outer ends of said arms and normally disposed adjacent the lower rear portion of said body in a substantially upright position, a cover hingedly carried by the bucket to control the open end thereof, power means for swinging said arms to move the bucket from its normal lowered position to a position adjacent said loading opening and vice versa, cooperating means on the body and bucket effective upon a predetermined movement of said arms to invert the bucket to cause it to dump its contents into the body through said loading opening, the mounting and weight of the bucket cover being such as to cause it to gravitate to open position when the bucket is inverted, a combination closure and material packing panel hingedly mounted on the body to move through said loading opening into and out of said body, and rods adjacent the outer side portions of the body and connecting said panel to said arms to transmit motion from the latter to the former.

9. In a refuse truck having an upper loading opening therein, arms having their inner ends externally pivotally mounted on side portions of the

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body, a refuse bucket movably mounted on the outer ends of said arms and normally disposed adjacent the lower rear portion of said body, power means for swinging said arms to move the bucket from its normal lowered position to a dumping position in registration with said loading opening and vice versa, a combination closure and material packing panel hingedly mounted on the body to move through said loading opening into and out of said body, said panel when in its fully opened position being projected upwardly outwardly relative to marginal portions of said loading opening and being formed with projecting wings whereby the panel may serve as a guide hopper relative to material dumped from the bucket through said loading opening, and rods adjacent the outer side portions of the body and connecting said panel to said arms to transmit motion from the latter to the former.

10. In combination, a vehicle body having a loading opening and a dumping opening, a gate hinged to the body and controlling the dumping opening, a panel hinged to the body and controlling the loading opening, a bucket for loading the body with charges of material through said loading opening, and common mechanical means for carrying the bucket from a loading point to a dumping position adjacent said body loading opening, for hingedly moving said panel, and for operating said gate.

11. In combination, a vehicle body having a loading opening, a panel hinged to the body and controlling the loading opening, a bucket for loading the body with charges of material through said loading opening, and an arm oscillatable on the body and carrying the bucket to move the same from a loading point to a dumping position adjacent said body loading opening and return and directly connected to said panel for simultaneously positively moving said panel relative to the loading opening in either direction.

12. In combination, a vehicle body having a loading opening, a panel hinged to the body and controlling the loading opening, a bucket for loading the body with charges of material through said loading opening, arms oscillatably mounted on the body and carrying the bucket to convey the same from a loading point to a dumping position adjacent said body loading opening and return and also directly connected to said panel for simultaneously moving said panel in both directions relative to the loading opening, and power actuated mechanical means for oscillating said arms.

13. In combination, a vehicle body having a loading opening and a dumping opening, a gate hinged to the body and controlling the dumping opening, a panel hinged to the body and movable into and out of the body through said loading opening, a bucket for loading the body with charges of material through said loading opening, common mechanical means for carrying the bucket from a loading point to a dumping position adjacent said body loading opening and for positively hingedly moving said panel in both directions, and a disconnectible member between said gate and said mechanical means for mechanically operating said gate when desired.

14. In combination, a tiltable vehicle body having a loading opening and a dumping opening, a gate hinged to the body and controlling the dumping opening, latch members carried by the gate and engageable with the body, a panel hinged to the body and movable into and out of the body through said loading opening, a bucket for loading the body with charges of material through

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said loading opening, mechanically operated arms oscillatably mounted on the body carrying the bucket and directly connected with said panel for positively operating both the bucket and the panel in the normal position of the vehicle body, and connections carried by the arms and releasably engageable with said latches for operating the latches and swinging the gate.

15. In combination, a vehicle having a loading opening and a dumping opening, a gate hinged to the body and controlling the dumping opening, latch members carried by the gate and engageable with the body, a panel hinged to the body and movable into and out of the body through said loading opening, a bucket for loading the body with charges of material through said loading opening, mechanically operated arms oscillatably

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mounted on the body carrying the bucket and connected with said panel for operating both the bucket and the panel, said arms having elongated recesses therein, and expansile and contractile cables anchored in said arms and extending through said recesses, said cables when elongated, being detachably engageable with said latch members whereby, upon oscillation of the arms with the cables attached to the latch members said latch members and the gate are automatically operated, and upon detachment of the cables from the latch members the cables are contracted to be substantially housed within the arm recesses.

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