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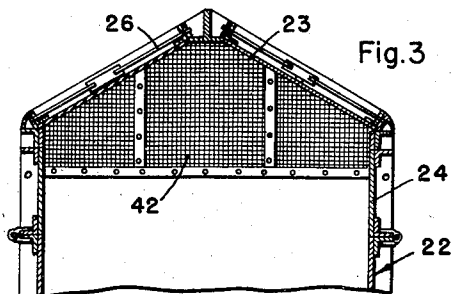
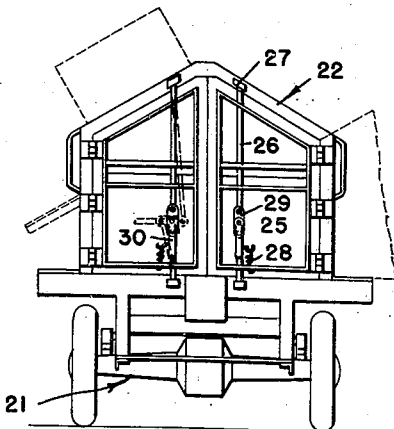
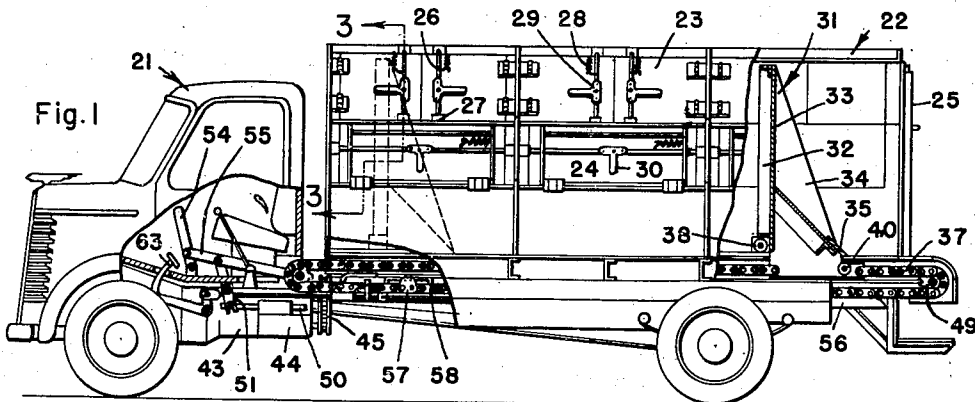
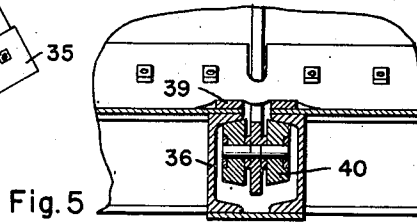
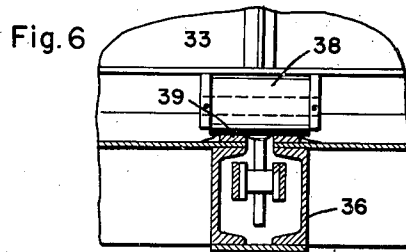
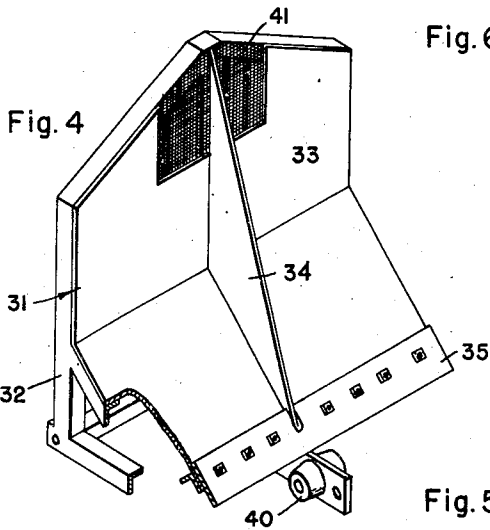
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2,258,988

REFUSE TRUCK

Filed July 30, 1940

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

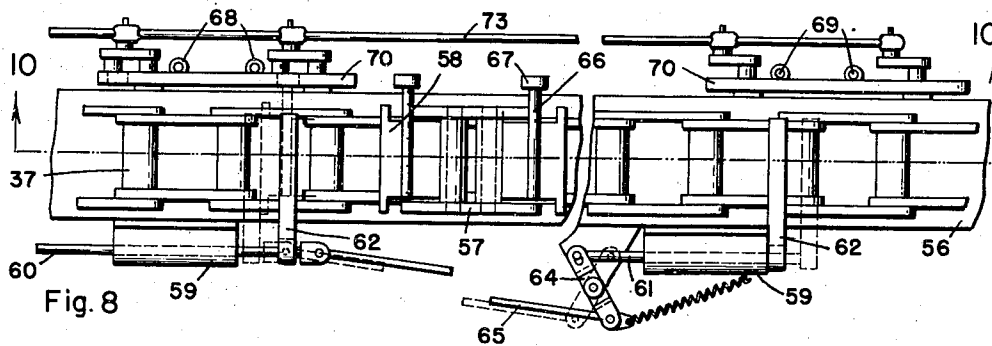


Fig. 8

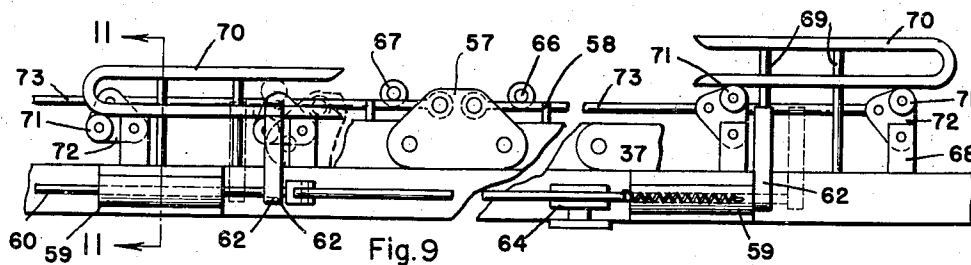


Fig. 9

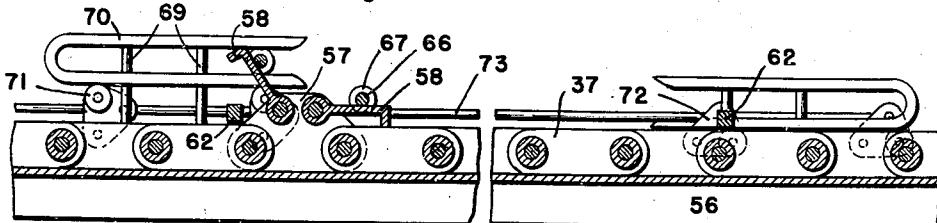


Fig. 10

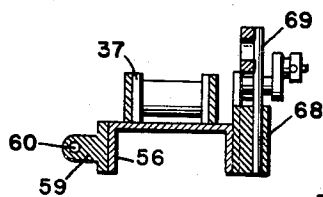


Fig. 11

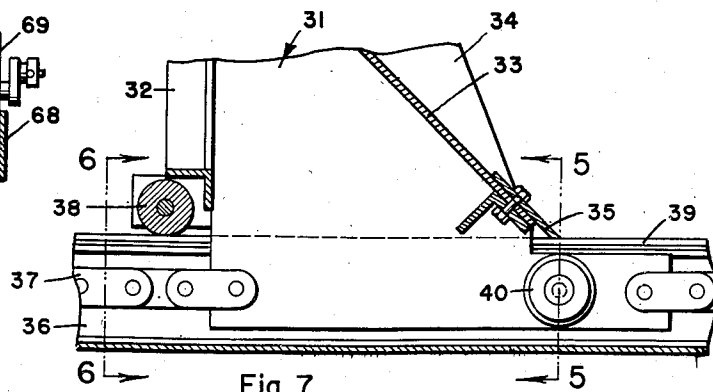


Fig. 7

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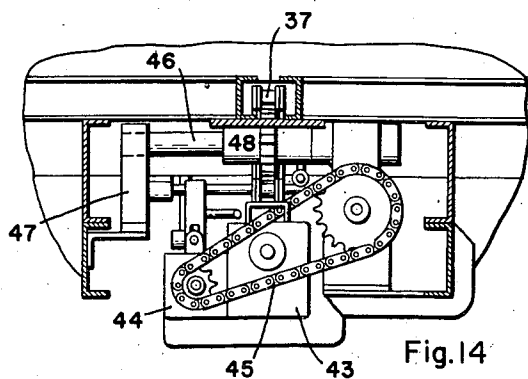
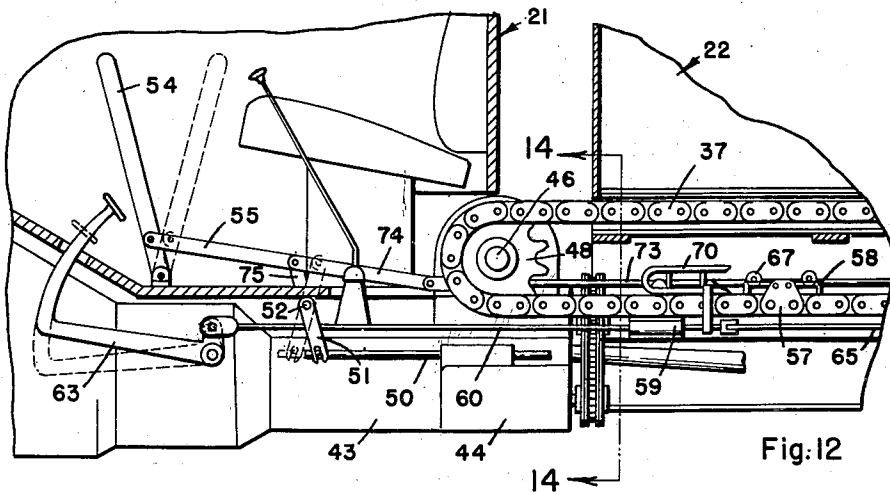
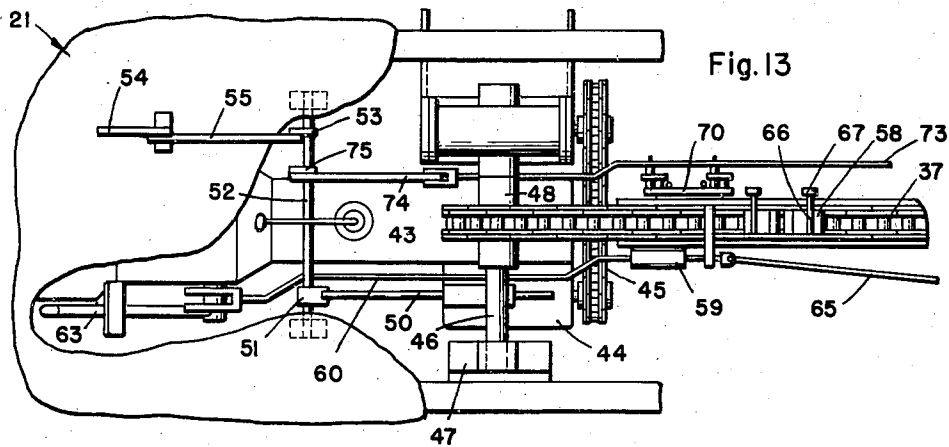
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3 Sheets-Sheet 3



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## UNITED STATES PATENT OFFICE

2,258,988

## REFUSE TRUCK

Louis A. Le Laurin, San Antonio, Tex.

Application July 30, 1940, Serial No. 348,404

7 Claims. (Cl. 214-82)

My invention relates to improvements in bodies for motor vehicles which are to be used in transporting loose and bulky materials such as garbage and other compressible materials.

An object of the invention is to provide a body for use in transporting bulky and compressible materials having a compression member, within the body and operable from the cab of the vehicle, for compressing the material as it is loaded. In vehicles now employed in the transportation of such materials the load is limited to the amount of material that can be loaded into the body manually. This is a wasteful procedure since the equipment is capable of conveying a much greater weight of material than can be loaded into the body manually. By compressing the material as it is loaded a much greater amount of material may be loaded into the body and the number of trips required between the points of collection and the disposal point are substantially reduced. In cities where a large volume of garbage is collected, a large percentage of the operating time of the collection vehicles is spent in traveling to and fro between the collection and disposal points. By compressing the garbage, and thereby increasing the capacity of the vehicles, the number of trips required to transport a given amount of material is reduced.

Another object of the invention is to provide means whereby power from the motor of the vehicle may be used to compress the material as it is loaded thereby assuring adequate compression of the material.

A further object of the invention is to provide means, operable from the driver's position in the vehicle, for operating the compression member within the body of the vehicle. Thus, when the vehicle arrives at the disposal point, the load may be discharged from the body without the use of manual labor.

A further object of the invention is to provide a body which may be loaded either from the sides or the top and having a plurality of side and top closures manually operable independently of each other so that material may be loaded and compressed in successive increments, and having an end closure for the discharge of the load.

Other objects and advantages will be apparent to those skilled in the art.

These objects are accomplished as described in the following description and illustrated in the accompanying drawings in which like ref-

erence characters are used in referring to like parts throughout the various views.

In the drawings:

Fig. 1 is a side elevation, partly in section, of a vehicle fitted with refuse body and compression means.

Fig. 2 is a rear elevation of the vehicle.

Fig. 3 is an enlarged sectional view taken on the line 3-3 Fig. 1.

Fig. 4 is an enlarged perspective view, partly in section, of the compression member removed from the body.

Fig. 5 is a sectional view taken on the line 5-5 Fig. 7.

Fig. 6 is a sectional view taken on the line 6-6 Fig. 7.

Fig. 7 is an enlarged fragmentary detail of the compression member.

Fig. 8 is an enlarged plan of the clutch releasing mechanism.

Fig. 9 is a side elevation of Fig. 8.

Fig. 10 is a sectional view taken on the line 10-10 Fig. 8.

Fig. 11 is a sectional view taken on the line 11-11 Fig. 9.

Fig. 12 is an enlarged vertical section, partly in elevation of the power take-off engaging and reversing means and the clutch releasing means.

Fig. 13 is a fragmentary plan of Fig. 12.

Fig. 14 is a sectional view taken on the line 14-14 Fig. 12.

In Figs. 1 and 2 a motor truck 21 is shown provided with the body generally denoted by the numeral 22 the body being provided with the top doors 23, the side doors 24, and the end doors 25. Either the side doors or the top doors are opened for loading while the end doors are provided for the discharge of the material at its destination. All these doors are provided with locking pins 26 normally held in their projected locking positions in their respective locking blocks 27 by the action of extension springs 28. The inner ends of the locking pins 26 are pivoted to opposite ends of a lever 29 provided with a handle 30 for manual manipulation of the locking pins. All doors open in the directions indicated by dotted lines in Fig. 2.

The compression member, or rake, illustrated in Fig. 4 and generally designated by the numeral 31, consists of a fabricated frame work 32 upon which is mounted the imperforate plate 33 the entire assembly being adequately braced against deflection when in use by a gusset 34 formed integral with the balance of the assembly. The lower portion of the plate 33 and frame

32 are angularly projected toward the rear of the body so that the rearward movement of the member during compression will tend to raise the material being compressed from the floor of the body and thereby prevent excess compression of the material near the floor while the material in the upper portion of the body might remain loose. Another advantage of the angular extension to the lower end of the compression member is that in discharging the load through the rear end of the body, all the load may be discharged without resorting to manual labor.

A wiper 35, composed of belting or some similar flexible material, is attached to the lower end of the plate 33 and projects rearwardly to engage the floor of the body at an angle and thereby prevent wedging of material beneath the compression member.

In order to provide connection for the driving means of the compression member the gusset 34 is projected downwardly through a longitudinal slot in the floor of the body and into the space between a pair of channel members 36 as shown in Figs. 5 and 6. A suitable chain 37 is then attached to each end of the gusset projection as a means of providing power for the movement of the compression member backward and forward. As a means of reducing friction during movement of the member 31, a series of rollers 38 are provided at the rear of the rake. These rollers run on tracks 39, attached to the floor of the body, and, preferably, three rollers are used one of these rollers being located at the center of the rake and one at either side. At the rear end of the downward gusset projection are provided a pair of rollers 40 adapted to engage the inner faces of the upper channel flanges. An examination of Fig. 1 will show that when the rake is moving toward the rear and compressing the material against the rear of the body the pull of the chain 37 is toward the right and the expansive force of the material being compressed is toward the left and acts against the upper portion of the rake. This combination of forces produces a downward force on the rollers 38 and an upward force on the rollers 40 which is as it should be since the rollers 38 engage the tracks 39 on the floor of the body and the rollers 40 engage the flanges of the channel members 36 and thereby prevent any tilting movement of the rake while in operation.

The upper portion of the compression member 31 is provided with a screened aperture 41 while the upper portion of the front end of the body is provided with a similar screened aperture 42 so as to permit vision throughout the length of the body from the operator's position in the cab of the vehicle.

In describing the transmission of power from the motor of the vehicle to the chain 37 attention is invited to Figs. 1, 12, 13, and 14. These views show the transmission case 43 of the motor vehicle provided with a conventional power take-off unit 44 as a means of deriving power from the motor vehicle drive. Since the speed of the output shaft of the power take-off is relatively high and as a lower speed is desirable in order to assure ample compressive force, a reduction in speed is made through the medium of a conventional worm geared speed reducer connected to the power take-off unit by the chain drive 45. The low speed shaft 46 from the worm gear speed reducer extends horizontally across the chassis of the motor vehicle and is supported at its left hand end by a suitable bearing 47. A sprocket

48, for engagement with the chain 37, is mounted on the shaft 46. The height of the shaft 46 with relation to the chassis of the motor vehicle is such as to bring the upper portion of the chain 37 into alignment with the interior of the channel members 36. An idler sprocket 49 is mounted on suitable bearings located at the rear end of the body, the chain 37 passing around this idler sprocket to attach to the rear end of the compression member 31. Thus, in effect, an endless chain connects the sprockets 48 and 49 and consequently rotation of the sprocket 48 in either direction will impart motion to the member 31, the direction in which the members moves being determined by the direction of rotation of the sprocket 48.

The direction of rotation of the power take-off is reversible and when the power take-off control is in central position no power will be transmitted through the unit. However, it is necessary to disengage the clutch of the motor vehicle in order to shift the power take-off control mechanism. As shown in Figs. 1, 12, and 13 the power take-off is provided with a control shaft 50 which carries at its forward end a pin engaging a slot in the rocker arm 51 mounted on the shaft 52. The shaft 52 is provided with an arm 53 which connects to the power take-off control lever 54 through the link 55. Figs. 1, 12, and 13 illustrate the power take-off control members in position for clockwise direction of rotation of the sprocket 48. Moving the lever 54 to the position indicated by the dotted lines in Fig. 12 will cause the power take-off to impart a counter-clockwise direction of rotation to the sprocket 48 and moving the lever 54 to its central position disengages the power take-off unit from the transmission of the motor vehicle. As stated above, the clutch of the motor vehicle must be disengaged before shifting of the power take-off parts can be made.

In order to eliminate the danger of running the compression member 31 into the ends of the body and thereby damaging, or breaking, parts in the power transmission system, a mechanism is provided to operate in conjunction with the chain 37 for disengaging the clutch of the motor vehicle prior to engagement of the member 31 with either end of the body. This safety mechanism is illustrated in detail in Figs. 8 to 13 inclusive.

The portion of the chain 37 connecting the under sides of the sprockets 48 and 49 is in contact, at its lower side with an inverted channel shaped member 56 extending practically the length of the body and acting as a rest for the chain as it travels to and fro. One of the connecting links in this portion of the chain contains the raised portions 57 between which are pivoted a pair of latches 58 projecting from each end of the link. These latches normally occupy a horizontal position, resting upon the upper face of an adjoining chain link as shown in Fig. 9. Attached to the flange of the channel member 56 proximate each end thereof are bearings 59 slidably supporting the sliding rods 60 and 61 which are provided with the stops 62. The forward end of the rod 60 connects to an upwardly extending portion of the clutch pedal 63. In these illustrations it is assumed that the sprocket 48 is rotating in a clockwise direction in which case the compressing member 31 is traveling toward the right and the link 57 in the lower portion of the chain is traveling to the left with each of these

members nearing the limits of their travel. As the sprocket 48 continues to rotate, the forward latch 58 will engage the forward stop 62 and further movement of the chain 37 will be transmitted through the rod 60 to the extension on the clutch lever 63 thereby moving the clutch lever to the position indicated by dotted lines in Fig. 12 when the clutch will begin to slip and no further motion will be transmitted through the power take-off to the sprocket 48. If the sprocket 48 should be rotating in a counter-clockwise direction then the lower portion of the chain 37 would be traveling in a right hand direction and the compression member 31 would be traveling in a left hand direction. As the compression member 31 and the link 57 approach the limits of their travel the rear latch 58 contacts the rear stop 62 and further movement of the chain will carry the stop with it and thereby moving the rod 61 to the rear. The forward end of the rod 61 is provided with a pin engaging a slot in one end of a rocker arm 64. The other end of the rocker arm 64 is provided with a link 65 connecting with the rear end of the forward rod 60. Thus, it is clear that rearward movement of the rod 61 will cause a forward movement of the rod 60 which is desired to disengage the clutch of the motor vehicle when the compression member nears the limit of its forward travel.

In the above described operations it will be noticed that the clutch of the motor vehicle is not fully disengaged, but only moved into sliding relation, and before any shifting of gears can be accomplished the clutch must be fully disengaged manually in order to avoid stripping of gears. However, after disengagement of the clutch it can not again be fully engaged so long as either of the stops 62 contacts its corresponding latch 58. For this reason, insufficient power would be transmitted through the clutch for normal operations unless some means were provided whereby the clutch could be fully engaged again. In order to accomplish this result each of the latches 58 is provided near its outer end with a projecting shaft 66 carrying at its outer end a roller 67. Mounted on the opposite side of the channel member 56 from the rods 60 and 61 and proximate each end of the channel member are housings 68 in spaced axial relation to the normal positions of their respective stops 62. Slidably mounted in these housings are pairs of uprights 69 to the upper ends of which are attached the slotted members 70 in alignment with and adapted to receive the rollers 67 of the latches 58. The vertical positions of the slotted members 70 are controlled by the positions of rollers 71 attached to the inner face and located at the periphery of plates 72 which are pivoted to the housings 68. The angular positions of the rollers 71 and the plates 72 are controlled by means of a common tie rod 73 which connects pins extending from the outer faces of the plates 72. Thus, movement of the rod 73 in either direction will cause a corresponding partial rotation of all plates 72 about their respective pivots and, consequently, will either raise or lower the rollers 71 controlling the vertical positions of the slotted members 70. The rod 73 is provided at its forward end (Figs. 12 and 13) with a link 74 connecting with an arm 75 attached to the shaft 52. Since the angular position of the shaft 52 is governed by the power take-off control lever 54 it follows that any movement of the lever 54 will serve to shift the power take-off gearing and simultaneously change the positions of the slotted

members 70 so that their positions will at all times correspond to the direction of travel of the chain 37.

In Fig. 12 the lever 54 is shown in its forward position and since when the lever is in this position the sprocket 48 is rotating in a clockwise direction it is clear that the lower portion of the chain 37 carrying the latches 58 will be moving forward. Assuming that the portion of the chain carrying the latches occupies the position illustrated in Fig. 9, then the compression member 31 will occupy a position as shown in Fig. 1, both members being near the extremity of their travel. Since the lever 54 is in its forward position, the tie rod 73 will also occupy its forward position and the forward slotted member 70 will be in its lowermost position and in alignment for the reception of the roller 67 of the forward latch 58. Continued rotation of the sprocket 48 will effect engagement of the latch 58 with the forward stop 62 and cause a forward movement of the rod 60 which moves the clutch lever 63 a sufficient distance to effect slipping of the clutch. Simultaneous with this last described action, the roller 67 has entered the slot in the member 70 and when the clutch begins to slip the various parts are in the positions indicated by dotted lines in Fig. 9. Now, assuming that it is desired to reverse the direction of rotation of the sprocket 48, the clutch is completely disengaged manually after which it is possible to shift the power take-off control lever 54 to the position indicated by the dotted lines in Fig. 12. Simultaneously with the shifting of the lever 54 the rod 73 moved rearwardly rotating the rollers 71 and the plates 72 about their pivots and the slotted members 70 assume the positions shown in Fig. 10. Here it will be seen that the latch 58 has been raised out of engagement with the stop 62 and the stop is free to return to its original position allowing full engagement of the clutch of the motor vehicle. The sprocket 48 will then rotate in a counter-clockwise direction and the portion of the chain carrying the latches 58 will travel rearwardly while the compression member 31 is moving forward. As the compression member 31 reaches approximately the limit of its forward travel the clutch of the motor vehicle will again be partially disengaged and it will be necessary to fully disengage the clutch manually and shift the lever 54 either to its neutral or reverse position before the clutch can again be fully engaged.

It will be observed that when the lever 54 is in its central position that both of the slotted members 70 occupy a partially raised position. In the event that movement of the lever 54 occurred while one of the latches was engaged with its stop the latch would then be raised out of engagement. If movement of the lever 54 occurs while the latches are intermediate their stops, and the lever is moved to its central position, there will, of course, be nothing to prevent complete return of the clutch to its fully engaged position. No motion is transmitted through the power take-off when the lever 54 is in its central position therefore, there can be no fouling of the rollers 67 against the ends of the slotted members 70 while they are in their intermediate positions.

While the preferred form of the invention is here disclosed it is to be understood that such changes as may lend themselves to individual installations may be made so long as these

changes do not depart from the spirit of the invention.

I claim:

1. In combination, a motor vehicle, a receptacle body mounted thereon, a plurality of top closures for said body, a plurality of side closures for said body, a pair of end closures for said body, locking means for all said closures, a transverse compression plate mounted for longitudinal movement in said body for compression of material therein, an angularly projecting portion from lower end of said compression plate said projecting portion being inclined toward the rear of said body for the purpose of assuring uniform compression of material at different body levels, wiping means attached to lower edge of said angular projection for prevention of wedging of material under said compression plate, a gusset formed integral with said compression plate and projecting through a longitudinal slot in floor of said body for connection to actuating means, wheels supporting front portion of said compression plate and engaging floor of said body, wheels mounted on rear end of said gusset for engagement with under sides of said longitudinal slot in floor of said body, a driving sprocket located at front of said body, an idler sprocket located at rear of said body, a chain passing around said sprockets and connecting at its ends with said gusset extension through said longitudinal slot in floor of said body, reversible power transmission means between said driving sprocket and motor of said vehicle, manually operable control means for said power transmission means, means operable by said chain for disengaging clutch of said motor when said compression plate approaches the limits of its longitudinal travel and means co-active with said chain and said manually operable control means for said power transmission means to permit re-engagement of said clutch when said manually operable control means is moved to neutral or reverse position.

2. In combination, a motor vehicle including a receptacle body, a plurality of manually operable closures for said body, locking means for said closures, a transverse compression plate mounted for longitudinal movement within said body and lower portion of said compression plate being angularly inclined toward the rear of said body, a gusset formed integral with said compression plate and extending downwardly through a longitudinal slot in floor of said body, floor engaging wheels for the support of front portion of said compression plate, a pair of wheels mounted on rear of said gusset beneath floor of said body and engaging under sides of said longitudinal slot in floor of said body, an idler sprocket at rear of said body, a driving sprocket at front of said body, a chain passing around said sprockets and ends of chain being secured to opposite ends of said gusset extension, reversible power communication means between motor of said motor vehicle and said driving sprocket, manually operable means located in cab of said motor vehicle for controlling application and direction of power to said driving sprocket, a longitudinal support secured to chassis of said motor vehicle for the support of lower portion of said chain, a link in said lower portion of said chain and extending upwardly therefrom, a pair of latches pivoted to said link and extending in opposite directions therefrom said latches normally occupying a horizontal position with their outer ends resting upon adjacent links of said chain, vertically mov-

able roller engaging members secured to said longitudinal chain support proximate the front and rear ends thereof, front and rear crank action adjusting members for governing the positions of said front and rear roller engaging members, a common link connecting both front and rear crank adjusting members for simultaneous movement thereof, connecting means between said common link and said manually operable means in cab of said motor vehicle for controlling application and direction of power to said driving sprocket, housings mounted on side of said longitudinal chain support opposite said vertically movable roller engaging members and in spaced longitudinal relation thereto, longitudinally sliding rods supported in said housings, rocker arm and link connecting means between said sliding rods whereby motion in one direction by one rod will produce motion in opposite direction by other rod, stops provided on said rods said stops projecting over top of said chain for engagement with said latches carried by said upwardly extending link and connecting means between forward of said rods with clutch lever of said motor vehicle for movement thereof when either of said latches imparts movement to either of said rods.

3. In combination, a motor vehicle including a receptacle body, a plurality of manually operable closures for said body, locks for said closures, a compressor plate movable longitudinally within said receptacle body for compression of material therein, reversible power transmission means between motor of said motor vehicle and said compressor plate, manually operable control means in cab of said motor vehicle for controlling application and direction of power to said compressor plate, automatic means associated with said power transmission means for disengagement of clutch in said motor vehicle when said compressor plate reaches the limits of its longitudinal travel and means co-active with said manually operable control means and power source for unobstructed re-engagement of said clutch upon manipulation of said manually operable control means.

4. In combination, a motor vehicle including a receptacle body, a plurality of manually operable closures for said body, locks for said closures, a chain actuated compressor plate movable longitudinally within said receptacle body for compression of material therein, reversible power transmission means between motor of said motor vehicle and said chain, manually operable means for controlling application and direction of power from the motor of the vehicle to said chain, clutch disengaging means co-active with said chain and said clutch of motor in said vehicle for disengagement of said clutch at extremities of said compressor plate travel and means co-active with said manually operable control means and said chain permitting free engagement of said clutch when position of said manually operable control means is changed.

5. In combination, a motor vehicle including a receptacle body, a plurality of manually operable closures for said body, a chain actuated compression plate mounted for longitudinal movement within said body for compression of material therein, reversible power transmission means between motor of said vehicle and said chain, manually operable control means for said reversible power transmission means, latches on said chain for disengaging clutch of said motor vehicle when compression plate reaches the extreme limits of its longitudinal travel, stops oper-

able by said latches at each end of compression plate travel, slidable rods for transmitting motion of said stops to said clutch, means for releasing said latches on chain from said stops to permit free re-engagement of said clutch when said control means is changed to neutral or reverse position and connecting means between said latch releasing means and said manually operable control means for said reversible power transmission means.

6. In combination, a motor vehicle including an enclosed body, a plurality of manually operable closures for said body including locks for same, a compression plate mounted in said body for longitudinal movement therein, sprocket and chain power means for actuating said compression plate, reversible power transmission means between said sprocket and chain means and motor of said motor vehicle, means co-active with said sprocket and chain means and said reversible power transmission means for disengaging clutch of motor in said motor vehicle when said compression plate reaches extremities of its travel, manually operable means located in cab of said motor vehicle for control of said reversible power transmission means and means co-active with said manually operable control means for positive release of said clutch disengaging means when said manually operable control means is moved to neutral or reverse position.

7. In combination, a motor vehicle including a receptacle body of substantially uniform transverse section, a plurality of top and side closures for said body mounted for flush alignment with

the interior of said body when in their closed positions, a pair of end closures for said body and the combined area of said end closures being equal to or greater than the transverse area of said body, a compression plate mounted for longitudinal movement within said body, an angularly projecting portion from the lower end of said compression plate and extending throughout the entire width thereof said projecting portion being inclined toward the rear of said body and adapted to project from the rear end of the body when the compression plate is in its rearmost position for the purpose of assuring uniform compression and complete discharge of material within the body, a longitudinally disposed gusset formed integral with said compression plate and extending through a longitudinal slot in the floor of said body, wheels carried by said compression plate proximate the front portion and in rolling engagement with the upper surface of the floor adjacent the slot in said floor, wheels carried by the rear portion of said gusset extension said wheels being located beneath the floor of the body and in rolling engagement with the under surface of the floor adjacent the slot therein said front and rear wheels acting in conjunction with the upper and lower surfaces of the floor adjacent the slot in said floor to prevent inclination of said compression plate within said body during the compression of material therein and power transmission means connective with said gusset extension beneath the floor of said body for utilizing power from the motor of the vehicle for movement of said compression plate.

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