

Aug. 2, 1966

V. L. BALBI

3,263,846

REFUSE COLLECTING VEHICLE

Filed Jan. 21, 1965

2 Sheets-Sheet 1

FIG. 1

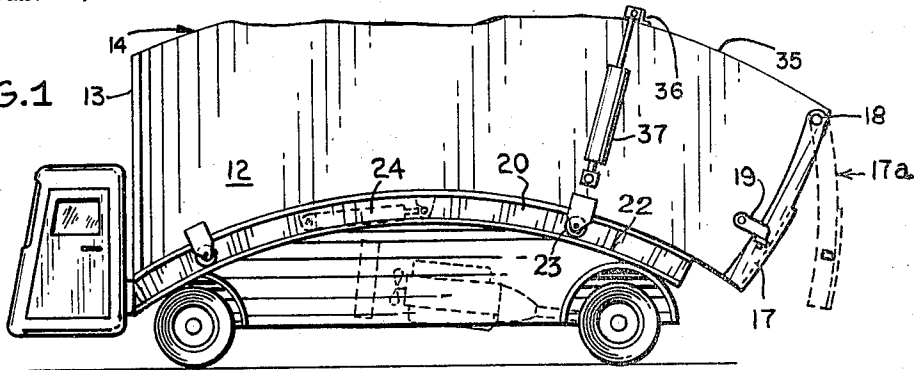


FIG. 3

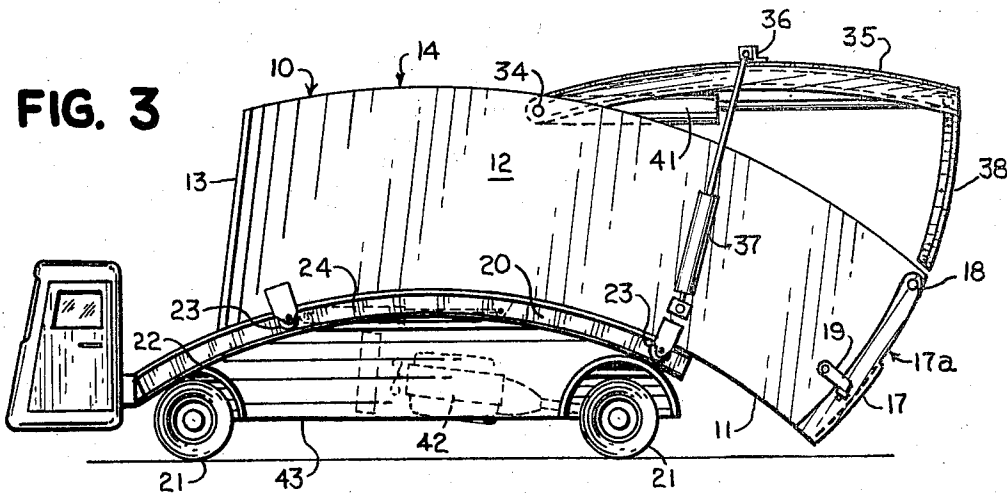
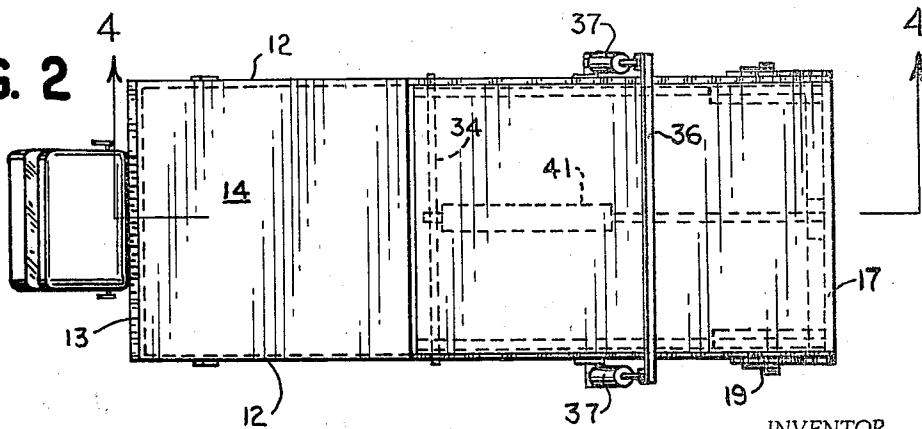


FIG. 2



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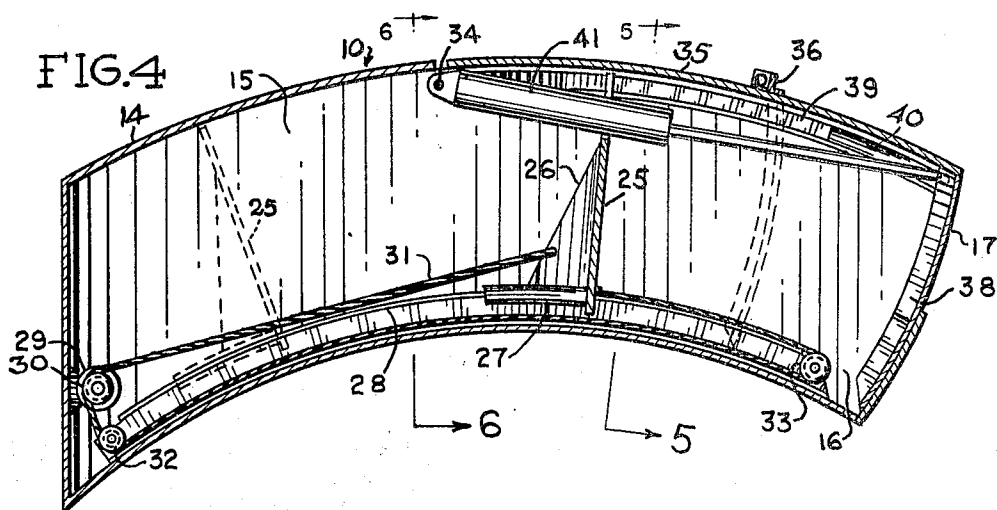


FIG. 5

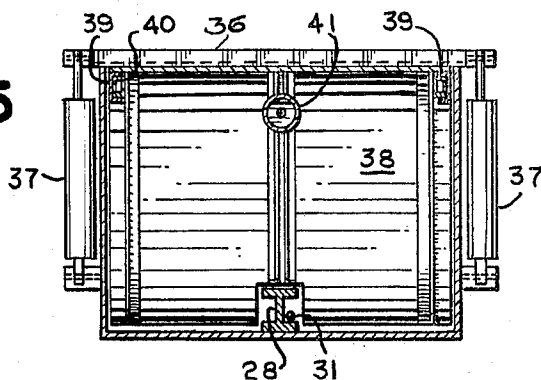
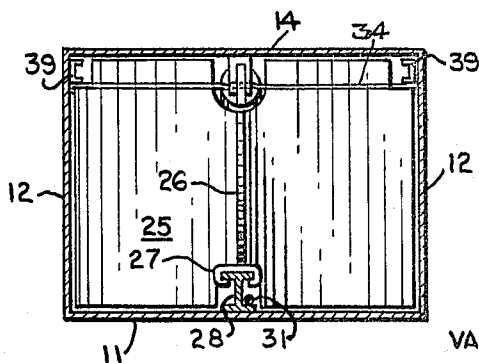


FIG. 6



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REFUSE COLLECTING VEHICLE

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6 Claims. (Cl. 214-518)

This invention relates to refuse collecting vehicles of the kind employed in collecting garbage and refuse.

Since the disposal dumps in most cities are remotely located with respect to the area where the refuse is collected, it is of considerable importance to provide a refuse collecting vehicle capable of carrying as large a load as possible. It is also desirable that the refuse collecting vehicle be loaded with a minimum amount of effort and that suitable compacting means be provided on such vehicle for increasing its storage capacity. With these ends in view, I have provided a new and improved refuse truck which embodies a forwardly and rearwardly adjustable body embodying a rear hopper portion which may be adjustably positioned near the ground level to facilitate the loading operation, and which may be adjusted to a higher level when compacting the loaded refuse to increase the carrying capacity of the body. Unlike the presently used refuse trucks wherein separate loading hoppers are used to receive the refuse initially, the present invention contemplates the provision of a refuse holding body having a rear built-in hopper portion communicating directly with the forward storage area of the body, such hopper portion having automatic means for shifting the refuse forwardly in the body and at the same time effectively compacting such refuse to increase the carrying capacity of the body substantially.

The present invention has for its primary object the provision of a refuse collecting vehicle of the kind characterized, comprising a forwardly and rearwardly adjustable refuse holding body embodying a self-contained rear hopper portion which may be adjusted to a position near the ground level to facilitate the loading operation and then to a higher level to prevent the escape of refuse during the compacting operation, the said body carrying automatic means for shifting the refuse loaded in the hopper portion to the storage area in the forward end of the body, thereby compressing the refuse and at the same time increasing the carrying capacity of the body.

Another object of my invention is to provide a refuse collector vehicle embodying an adjustable refuse holding body which may be first adjusted rearwardly to position the rear hopper portion near the ground level to facilitate the manual loading operation, and then forwardly to elevate the hopper portion to prevent the refuse from escaping as the compacting means is brought into operation.

Other and further objects of my invention will be pointed out hereinafter or will be indicated in the appended claims, or will be obvious to one skilled in the art upon an understanding of the present disclosure. For the purpose of this application, I have elected to show herein certain forms of a refuse collecting truck representative of my invention; it is to be understood, however, that the embodiment of my invention herein shown and described is for purposes of illustration only and that therefore it is not to be regarded as exhaustive of the variations of the invention in the art.

In the accompanying drawings:

FIG. 1 is a side elevational view of a refuse collecting vehicle illustrative of my invention;

FIG. 2 is a top plan view of the same;

FIG. 3 is a side elevational view of the vehicle showing the body in its rearwardly adjusted position for receiving the refuse to be loaded into the rear hopper portion, and also showing the refuse compacting member in a raised position preparatory to its being lowered and ac-

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tuated in a forward direction to shift the refuse in the hopper portion forwardly in the body and to compact such refuse;

FIG. 4 is a sectional view taken on the line 4-4 of FIG. 2;

FIG. 5 is a sectional view taken on the line 5-5 of FIG. 4; and

FIG. 6 is a sectional view taken on the line 6-6 of FIG. 4.

Referring to the drawings, the numeral 10 designates a large capacity vehicle body, preferably of generally arcuate form, having an arcuate bottom 11, opposed sides 12, 12, a closed forward end 13 and a curved top 14. The forward end portion of the body provides a storage compartment or area, as at 15, for refuse, and the rear end portion provides a hopper 16 into which refuse is initially loaded through a rear opening in the body. The hopper portion of the body is provided with a tail gate 17, which is suspended from the opposed sides 12, 12, as at 18, and suitable latch means 19 at the said sides normally maintains the tail gate in a closed position. The tail gate is provided with an upper opening, as at 17a, to permit the loading of refuse into the hopper portion 16 of the body.

The body is mounted for rearward and forward adjustment on an arcuate frame 20, which may be a sub-frame supported on the vehicle chassis, or it may constitute the vehicle chassis itself; in either case, such frame is mounted on and supported by the wheels 21 of the vehicle. The frame 20 comprises parallel arcuate frame members of substantially U-shaped in cross-section which provide suitable tracks 22 upon which rollers 23 secured to the body are supported for rearward and forward movement. The rearward adjustment of the body 10 to the position shown in FIG. 3 positions the hopper portion 16 near the ground level so refuse can be easily loaded into such hopper portion through the upper opening 17a in the tail gate 17. The forward adjustment of the body to the position shown in FIG. 1 elevates the hopper portion 16 so the loaded contents may be retained therein while the compacting and forwardly shifting operation is in progress, as will be presently described. Since the rearward and forward adjustment of the body requires only a limited movement in either direction, the tracks 22 may not necessarily be arcuate in shape, but there may be provided short upwardly converging pairs of curved or straight tracks of sufficient length to permit the required movement of the body.

The body 10 is adjusted rearwardly and forwardly by means of one or more hydraulic cylinder mechanisms 24, the operation of which is controlled in the usual manner by suitable valves (not shown).

Mounted for rearward and forward movement inside the body 10 is a pusher plate 25 which extends across the interior of the body, with suitable clearance at its edges being provided to permit the free movement thereof. In the embodiment illustrated on the drawings, the pusher plate 25 is provided centrally with an upright rearwardly extending brace member 26 having secured to its lower edge a guide element 27, which slidably embraces an I-shaped track 28 secured to and extending longitudinally along the bottom 11 of the body 10. The pusher plate 25 is adapted to be moved forwardly by a forward pressure thereon when the refuse in the hopper portion 16 is shifted forwardly, as will be later described. The rearward movement of the pusher element after the body is loaded causes the discharge of the compacted refuse through the opening at the rear end of the body, such movement being provided by the mechanism about to be described. Mounted inside the forward end of the body 10 is a suitable motor 29, which is operatively connected to a winch 30. A cable 31 wound around

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the winch is connected to the brace member 26, and such cable extends downwardly from the winch over a sheave 32 mounted on the forward end of the bottom 11 of the body, then rearwardly and over a second sheave 33 mounted on the rear end of the said bottom and then forwardly to the pusher plate 25 to which it is secured. The pusher plate 25 is actuated forwardly only when a predetermined pressure is applied thereto by the refuse shifted forwardly in the hopper portion 16.

Suitable resistance to the forward movement of the pusher plate 25 being provided by means of the winch makes possible the compacting of the refuse when the latter is shifted forwardly against the pusher plate, it being noted that when the pusher plate is urged forwardly by a predetermined forward pressure thereon, the winch is rotated in a reverse direction while at the same time providing a certain amount of resistance to such movement. The winch and motor are suitably connected to one another to permit the rotation of the winch by the motor when the pusher plate 25 is to be actuated rearwardly to discharge the refuse from the body 10. As shown by the broken lines in FIG. 4, the pusher plate is adapted to be gradually moved forwardly to the forward end of the body as the refuse is shifted forwardly with each filling of the hopper 16.

Pivotally mounted for up and down movement on a transverse pivot rod 34 supported on the sides 12, 12 of the body 10 is a curved top member or top plate 35, which preferably, although not necessarily, is so constructed that in a lowered position it is adapted to close the upper side of the hopper 16 substantially. Secured to and overlying the top plate 35 is a transverse member or bar 36, and pivotally connected thereto and to the sides 12, 12 of the body are a pair of hydraulic cylinder mechanisms 37, which comprise the usual cylinders, piston rods and plungers (not shown). The hydraulic cylinder mechanisms 37 are adapted to operate simultaneously to raise the top plate 35 and lower the same.

Adjustably supported by the top plate 35 for forward and rearward adjustment is a depending compacting or compressing member 38, which is adapted to extend downwardly inside the hopper 16 alongside the tail gate 17 to close the opening 17a in the latter when the top plate is in its downwardly adjusted position. Secured to and underlying the lateral edge portions of the top plate 35 are a pair of parallel, opposed guides 39, which slidably support a pair of forwardly extending lateral extensions 40, rigidly secured to the compacting member 38. The compacting member 38 is adapted to be reciprocated rearwardly and forwardly by a suitable hydraulic cylinder mechanism 41, which is connected to the transverse rod 34 and the compacting member. Suitable control valves (not shown) are employed in the usual manner with the hydraulic cylinder mechanisms 24, 37 and 40 to permit an operator to control the timely operation thereof selectively.

The vehicle's engine 42 is preferably supported under the chassis and within a suitable enclosure 43.

When loading the body, the hydraulic cylinder mechanism 24 is actuated in the usual manner to adjust the vehicle body rearwardly so the rear end thereof is positioned near the ground level, as shown in FIG. 3. The hydraulic cylinder mechanisms 37, 37 are simultaneously actuated to raise the top plate 35 and the compacting member 38 pivotally so the opening 17a in the tail gate 17 is accessible to permit the convenient loading of refuse into the hopper 16. After the hopper is loaded, the hydraulic cylinder mechanism 24 is preferably operated in a reverse manner to adjust the body 10 forwardly to raise the rear end of the latter as shown in FIG. 1. The cylinder mechanisms 37, 37 are then actuated in the reverse direction to lower the top plate 35 and the compacting member 38, so the latter is positioned inside the hopper directly behind the refuse. The cylinder mechanism 41 is then actuated to adjust the compacting member 38 for-

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wardly to shift the refuse in the same direction toward the storage area 15 and against the pusher plate 25, thereby compressing the refuse and at the same time emptying the hopper so another load may be placed therein. Each succeeding load of refuse is shifted forwardly and compressed, and with each forward movement of the compacting member 38 after, say, the initial loading of the hopper, the pusher plate 25 is gradually moved forwardly until it reaches its extreme forward position, as shown by the broken lines in FIG. 4. After the storage area 15 of the body becomes filled with compressed refuse, the pusher plate 25 may be actuated rearwardly through the operation of the motor 29 and the winch 30 to discharge said refuse from the rear end of the body, this being made possible after the compacting member 38 is raised to its uppermost position and the latch means 19, 19 are released to permit the tail gate 38 to swing freely in a rearward direction. It is to be noted that the forward shifting of the refuse from the hopper into the storage area of the vehicle body may be accomplished while the said body is retained in a rearwardly adjusted position.

What I claim is:

1. In a refuse collecting vehicle, a supporting frame having longitudinal, arcuate, parallel tracks, a vehicle body mounted on the tracks for forward and rearward movement, the body being provided with a rear opening and having a forward storage compartment and a rearward hopper arranged in communication with each other, means for adjusting the body rearwardly to lower the rear end of the body and forwardly to raise the said rear end, a pusher plate mounted in the body for forward and rearward adjustment, the pusher plate being positioned forwardly with respect to the hopper, and such pusher plate being adapted to be urged forwardly by a predetermined forward pressure thereon, means for actuating the pusher plate rearwardly to discharge refuse through the hopper and from the vehicle body through the rear opening, a rearwardly disposed top plate pivotally mounted at its forward end on the body for upwardly and downwardly swinging movement, the top plate in its downward position being adapted to close the top of the hopper substantially, a depending refuse compacting member carried at the rear portion of the top plate and arranged for forward and rearward adjustment, the said compacting member being adapted to extend into the rear end portion of the hopper when the top plate is in a lowered position, means to raise and lower the top plate and the compacting member, and means to adjust the compacting member forwardly to shift the refuse in the hopper against the pusher plate and into the storage compartment and to adjust the compacting member rearwardly.

2. In a refuse collecting vehicle, a supporting frame having longitudinal, supporting tracks, the forward and rear portions of such tracks converging upwardly toward each other, a vehicle body mounted on the tracks for forward and rearward movement, the body having a rear opening and also having a forward storage compartment and a rearward hopper arranged in communication with each other, means for adjusting the body rearwardly to lower the rear end thereof and forwardly to raise the said rear end, a pusher plate mounted in the body for forward and rearward movement, the said pusher plate being positioned forwardly of the hopper and adapted to be moved forwardly by a predetermined forward pressure thereon, means to actuate the pusher plate rearwardly to discharge refuse through the hopper and the opening in the rear end of the body, a rearwardly disposed top plate pivotally mounted at its forward end on the body for upwardly and downwardly swinging movement, the top plate in its downward position being adapted to close the top of the hopper substantially, a depending refuse compacting member carried at the rear end portion of the top plate and arranged for forward and rearward adjustment, the said compacting member being adapted to extend into the rear end portion of the hopper to engage

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rearwardly with refuse in such hopper when the top plate is in a lowered position, means to raise and lower the top plate and the compacting member, and means to adjust the compacting member forwardly to shift the refuse in the hopper against the pusher plate and into the storage compartment and to adjust the compacting member rearwardly.

3. In a refuse collecting vehicle, a supporting frame having longitudinal, arcuate, parallel tracks, a vehicle body of generally arcuate shape mounted on the tracks for forward and rearward movement, the body having a rear opening and a rear hopper and a forward storage compartment, the hopper and the compartment being in direct communication with each other, means to adjust the body forwardly and rearwardly to raise and lower the rear end of such body, a pusher plate mounted in the body for forward and rearward movement, the pusher plate being positioned forwardly of the hopper, means for actuating the pusher plate rearwardly to discharge refuse through the rear opening in the body, a top plate pivotally mounted at its forward end on the body for upwardly and downwardly swinging movement, the top plate in its downward position being adapted to close the top of the hopper substantially, a depending refuse compacting member carried at the rear end of the top plate and arranged for forward and rearward adjustment, the said compacting member being adapted to extend into the rear end portion of the hopper to engage rearwardly with refuse in such hopper when the top plate is in a lowered position, means to raise and lower the top plate and the compacting member, and means to actuate the compacting member forwardly and rearwardly.

4. In a refuse collecting vehicle, a supporting frame having supporting tracks, the forward and rearward portions of such tracks converging upwardly toward each other, a vehicle body of generally arcuate shape mounted on the tracks for forward and rearward movement, the body having a rear opening and a rear hopper portion and a forward storage compartment, the hopper portion and the compartment being in communication with each other, means to adjust the body rearwardly and forwardly to lower and raise the rear end of the body, a pusher plate mounted in the body for forward and rearward movement, means to actuate the pusher plate rearwardly to discharge refuse through the opening in the rear end

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of the body, a top member pivotally mounted at its forward end on the body and arranged to swing upwardly and downwardly, a refuse compacting member carried at the rear end of the top member and arranged for forward and rearward adjustment, the said compacting member being adapted to extend into the rear end of the hopper portion of the body to engage rearwardly with the refuse in such hopper portion when the top member is in a lowered position, means to raise and lower the top member and the compacting member, and means to actuate the compacting member forwardly and rearwardly.

5. In a refuse collecting vehicle, a supporting frame having supporting tracks, the forward and rearward portions of such tracks converging upwardly toward each other, a vehicle body of generally arcuate shape mounted on the tracks for forward and rearward adjustment, the body having a rear hopper portion and a forward storage compartment in communication with each other, the body having a rear opening to admit refuse into the hopper portion, means mounted on the body to shift refuse from the hopper portion into the storage compartment, and means in the body to discharge the refuse from the body through the rear opening.

6. In a refuse collecting vehicle, a supporting frame having arcuate tracks, a vehicle body of generally arcuate shape mounted on the tracks for forward and rearward adjustment, the body having a rear hopper portion and a forward storage compartment in communication with each other, the body having a rear opening to admit refuse into the hopper portion, a refuse compacting member mounted on the body and arranged for adjustment to a position extending into the rear end of the hopper portion to engage rearwardly with the refuse therein, and said compacting member being arranged for adjustment to a withdrawn position with respect to the hopper portion, means connected to the refuse compacting member to adjust said compacting member into the hopper portion and to withdraw said compacting member from the hopper portion, a pusher member mounted in the body to discharge the refuse through the rear end opening in the body.

No references cited.

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