May 1, 1962 J. McCARTHY 3,032,216

CONTAINER DUMPING ATTACHMENT FOR REFUSE TRUCKS

Filed March 28, 1958 5 Sheets-Sheet 1

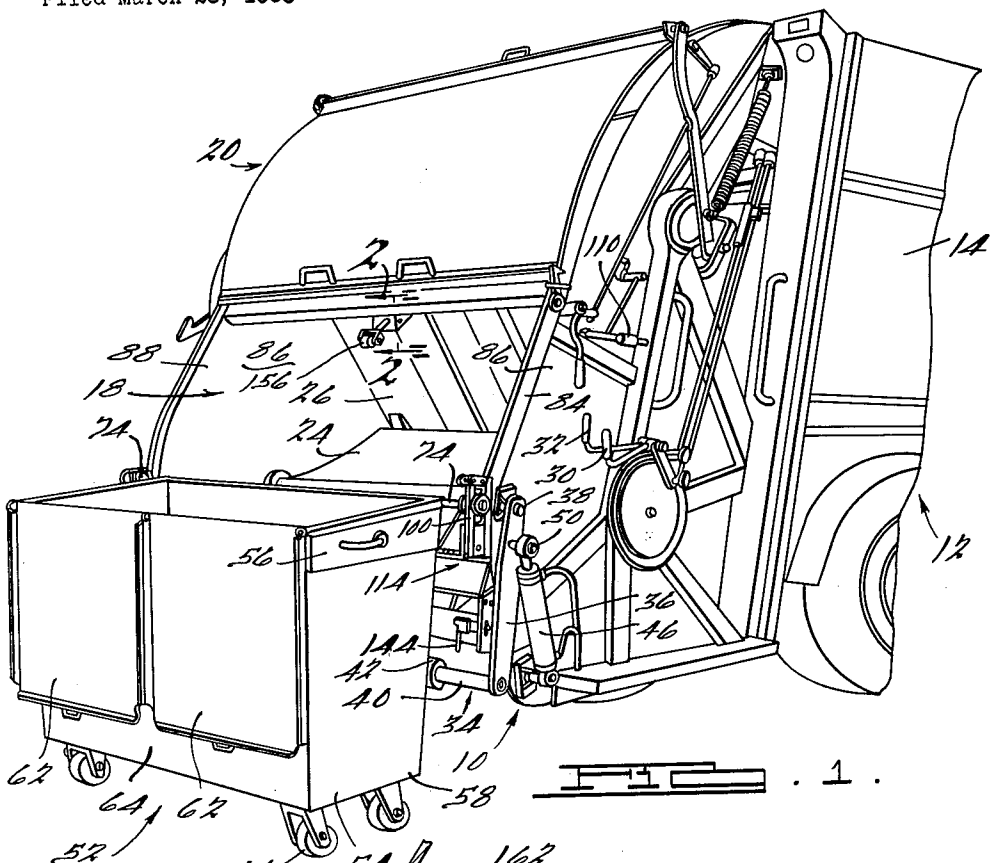


FIG. 1.

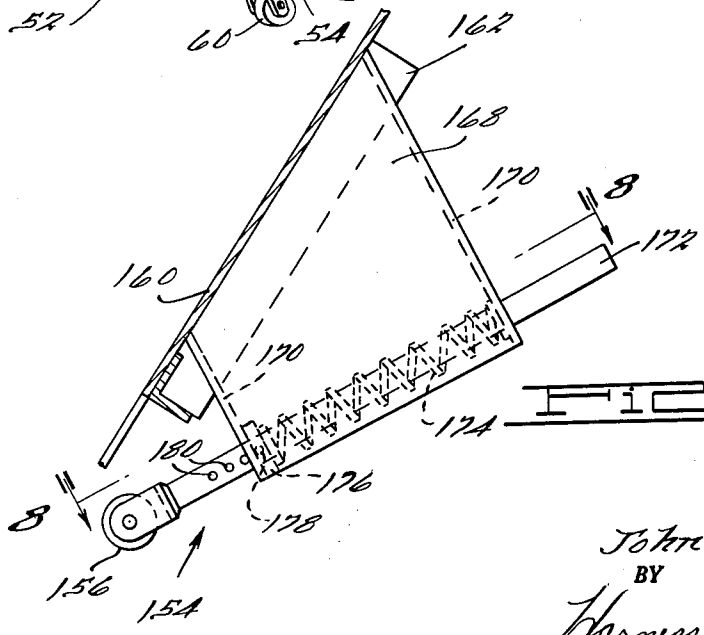


FIG. 2.

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May 1, 1962 J. McCARTHY 3,032,216

CONTAINER DUMPING ATTACHMENT FOR REFUSE TRUCKS

Filed March 28, 1958 5 Sheets-Sheet 2

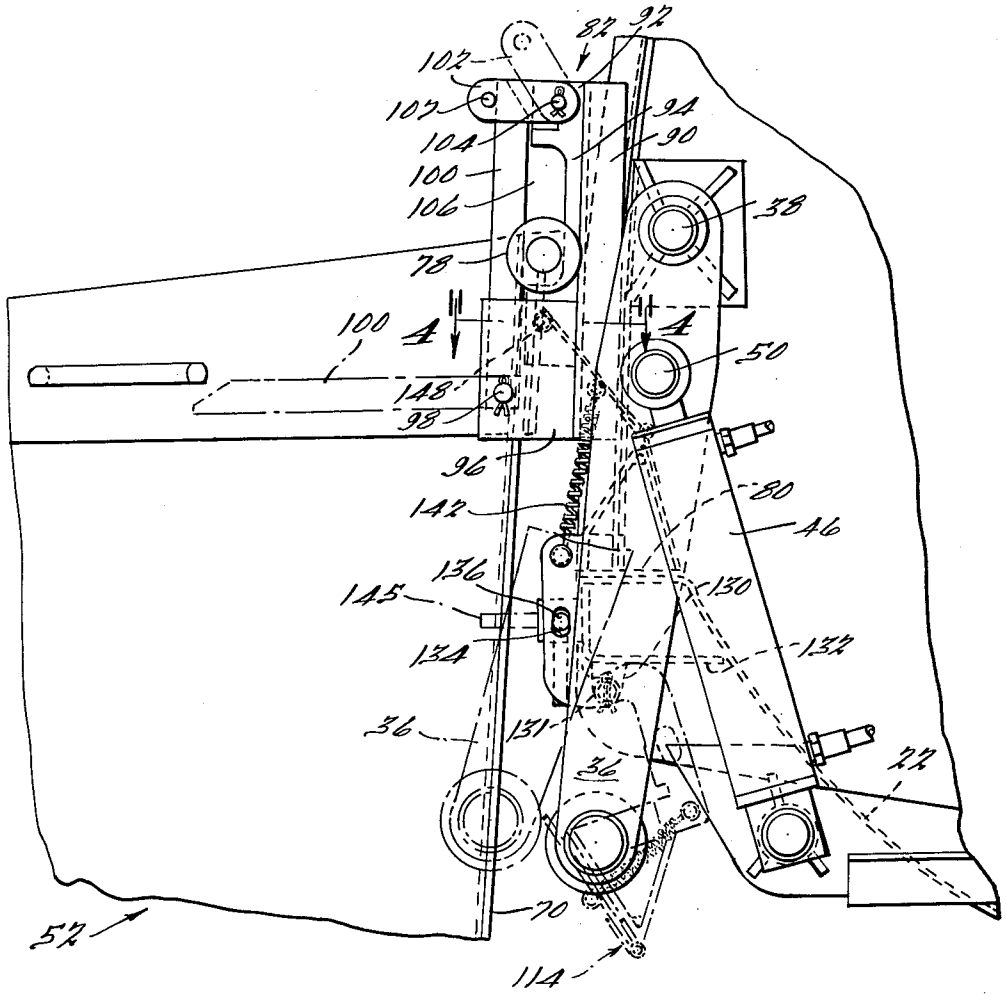


FIG. 3.

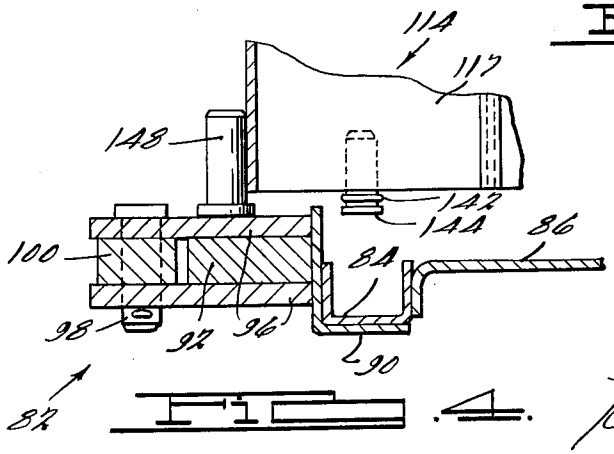


FIG. 4.

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May 1, 1962 J. McCARTHY 3,032,216

CONTAINER DUMPING ATTACHMENT FOR REFUSE TRUCKS

Filed March 28, 1958 5 Sheets-Sheet 3

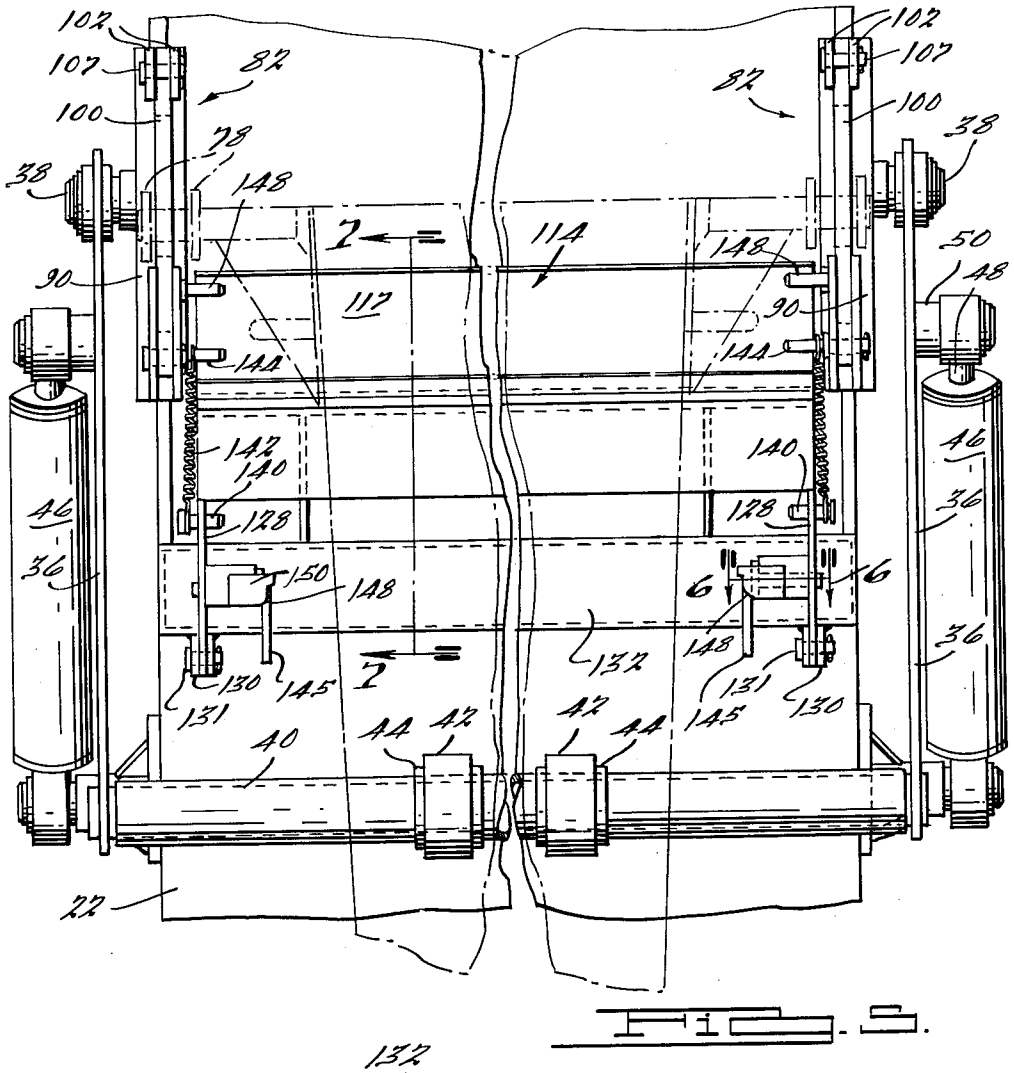


Fig. 5.

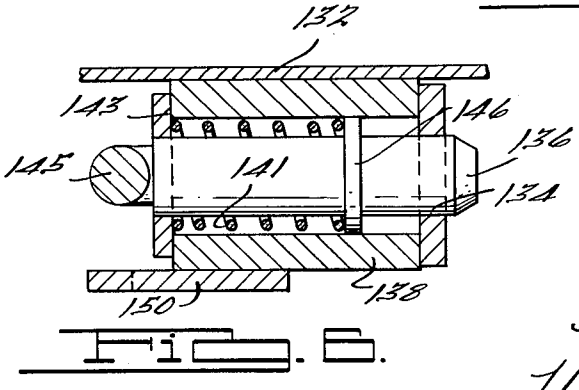


Fig. 6.

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May 1, 1962 J. McCARTHY 3,032,216

CONTAINER DUMPING ATTACHMENT FOR REFUSE TRUCKS

Filed March 28, 1958 5 Sheets-Sheet 4

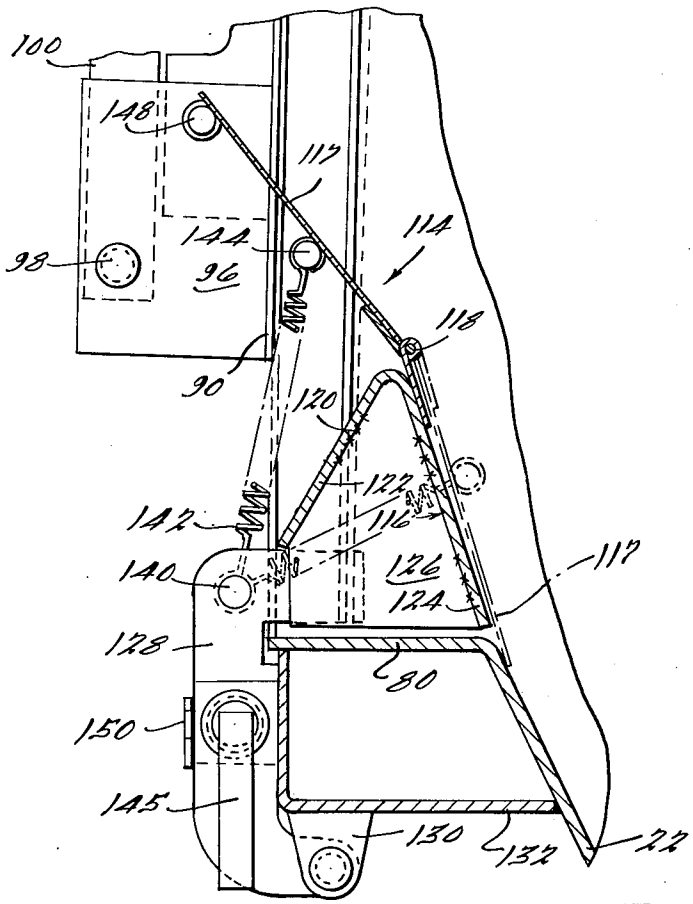


FIG. 7.

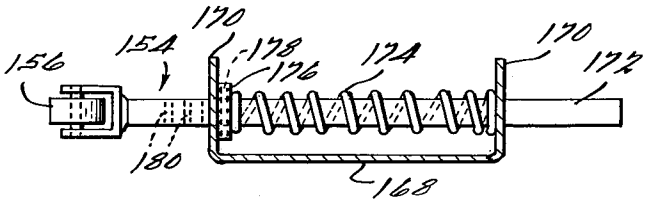


FIG. 8.

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May 1, 1962 J. McCARTHY 3,032,216

CONTAINER DUMPING ATTACHMENT FOR REFUSE TRUCKS

Filed March 28, 1958 5 Sheets-Sheet 5

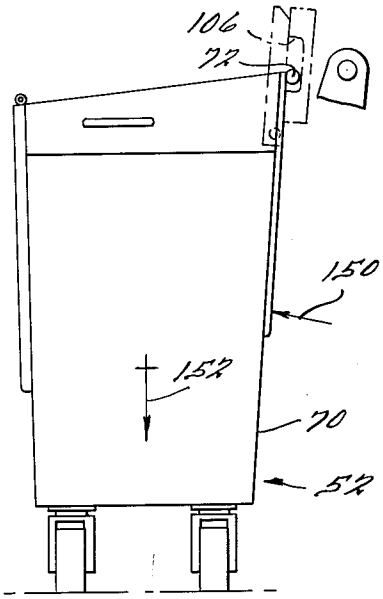


FIG. 9.

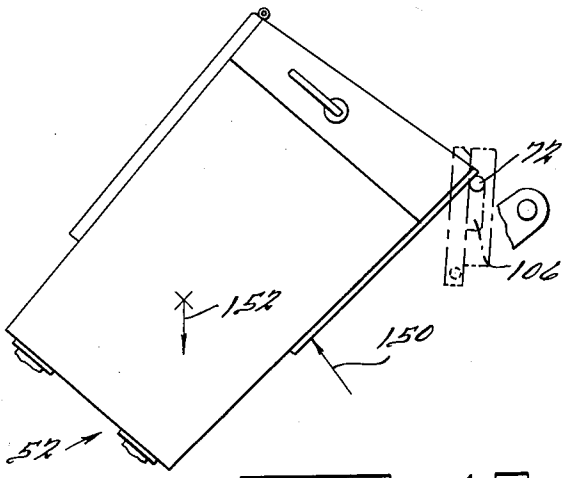


FIG. 10.

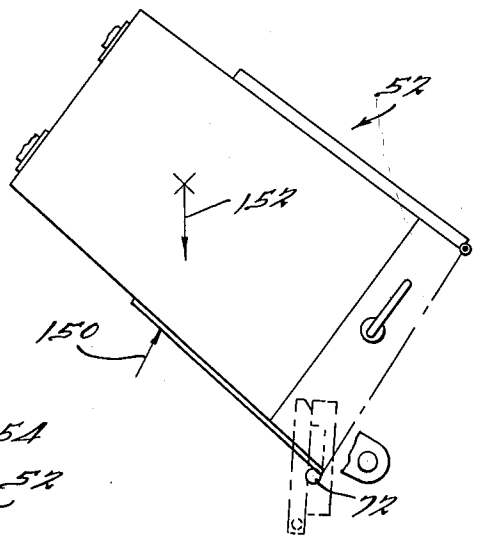


FIG. 11.

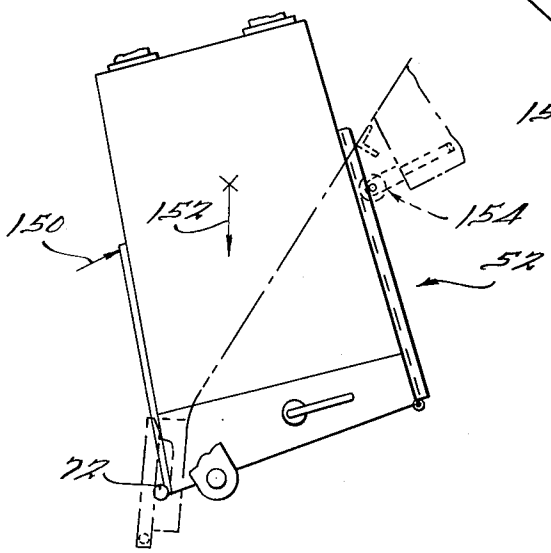


FIG. 12.

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United States Patent Office 3,032,216 Patented May 1, 1962

3,032,216
CONTAINER DUMPING ATTACHMENT FOR REFUSE TRUCKS

John McCarthy, Dearborn, Mich., assignor to Gar Wood Industries, Inc., Wayne, Mich., a corporation of Michigan

Filed Mar. 28, 1958, Ser. No. 724,731
14 Claims. (Cl. 214—302)

This invention relates generally to refuse collecting trucks and more particularly to a container dumping attachment for refuse trucks.

The usual refuse truck has a body and a loader at the rear end of the body for compressing and compacting refuse into a storage compartment in the body. Pickup men lift household refuse containers into positions in which refuse therein empties into the loader. In some situations, such as large apartment areas, refuse containers which are larger than the usual household size that can readily be lifted are more satisfactory, both from a loading and unloading standpoint. Since these containers are of a size much too large to be handled manually, a dumping attachment must be provided on a refuse truck for handling these containers. A truck equipped with such an attachment can then be operated so as to quickly dump the contents of the large container into the loader trough.

It is an object of this invention, therefore, to provide an improved container dumping attachment of the above type.

A further object of this invention is to provide a container dumping attachment which can be connected to a container to be dumped while the container is on the ground and which operates an upwardly swinging lift unit that quickly moves the container to an inverted position.

Another object of this invention is to provide a container dumping attachment which operates before completing the dumping of a container to drop the container while it is inverted against a rigid stop so that any refuse sticking to the container walls or jammed in the container is forcibly dislodged and discharged into the loader trough.

A further object of this invention is to provide a container dumping attachment which is substantially independent from the loader mechanism that transfers refuse from the trough to the storage compartment in the truck body so that the loader can be operated without the necessity for first releasing the container from the dumping attachment.

A further object of this invention is to provide a container dumping attachment which includes a shield assembly that is movable to a position in which it constitutes an upward extension of the outer side of the loader trough to prevent overflow of refuse from the trough during dumping of a container.

Still a further object of this invention is to provide a container dumping attachment for a refuse truck which is simple in construction, economical to manufacture, and efficient in operation in dumping the contents of a container without requiring any manual lifting of the container.

Further objects, features and advantages of this invention will become apparent from a consideration of the following description, the appended claims and the accompanying drawing in which:

FIGURE 1 is a perspective view of a rear end portion of a refuse truck provided with a loader and the container dumping attachment of this invention, and illustrating a container in a position to be dumped by the attachment;

FIG. 2 is an enlarged sectional view looking along the line 2—2 in FIG. 1;

FIG. 3 is a fragmentary side elevational view of the container dumping attachment of this invention, shown in a mounted position on a refuse loader and in a position for dumping a container;

FIG. 4 is an enlarged fragmentary sectional view looking along the line 4—4 in FIG. 3;

FIG. 5 is a fragmentary rear elevational view of the dumping attachment of this invention mounted on a refuse loader and showing a container in a position to be dumped by the attachment;

FIG. 6 is an enlarged sectional view looking along the line 6—6 in FIG. 5;

FIG. 7 is a fragmentary sectional view looking along the line 7—7 in FIG. 5;

FIG. 8 is a sectional view looking along the line 8—8 in FIG. 2; and

FIGS. 9, 10, 11 and 12 are diagrammatic views showing progressively moved positions of a container being dumped by the attachment of this invention.

With reference to the drawing, the container dumping attachment of this invention, indicated generally at **10**, is illustrated in FIG. 1 mounted on a truck **12**, of well known type, having a body **14** which encloses a refuse storage compartment. The truck **12** is used for making house to house pickups of refuse which is compressed and compacted into the storage compartment by means of a loader **18** on the rear end of the truck. The loader **18** is included in a hollow tail-gate structure **20** pivotally supported at its upper end on the rear end of the body **14**, which is open for receiving refuse from the loader **18**. The loader **18** and its control are described in detail in applications, Serial No. 635,488, filed January 22, 1957, now Patent No. 2,879,906, and Serial No. 635,487, filed January 22, 1957, now Patent No. 2,975,913, owned by the assignee of this invention. It operates to transfer refuse dumped into a loading trough or hopper **22** at the lower end of the tail-gate **20** into the storage compartment and includes a sweep panel **24** that moves through the trough **22** so as to lift the refuse therein to a supported position on the panel **24** and in horizontal alignment with the open rear end of the storage compartment. A ram panel **26** moves across the sweep panel **24** for moving the refuse off the sweep panel and compacting it in the storage compartment. A control lever **30** can be actuated to provide for an automatic operation of the sweep panel **24** and the ram panel **26** through a loading cycle as described in detail in the above mentioned applications. A second handle **32** is provided for independently controlling operation of the ram panel **26** in the event refuse becomes jammed in the loader **18**.

The dumping attachment **10** is mounted on the tail-gate **20** and includes a lift unit **34** of a generally U-shape having a pair of arms **36** pivotally supported at their free ends on trunnions **38** carried by the tail-gate **20** at a position above the upper side of the loading trough **22**. An elongated tubular member **40** in the U-shape lift unit **34** extends between the opposite ends of the arms **36** and carries a pair of spaced rollers **42** (FIG. 5) each of which is maintained at a predetermined position on the tubular member **40** by a pair of retainer rings **44**. A pair of hydraulic cylinder assemblies **46** arranged on opposite sides of the tail-gate **20** at positions adjacent the lift arms **36** are pivotally supported at their lower ends on the tail-gate **20**. Each cylinder assembly **46** includes a piston rod **48** which is connected at its upper end to a pin **50** secured to the adjacent lift arm **36** at a position between the ends thereof. On actuation of the cylinder assemblies **46**, to extend the piston rods **48** thereof, the lift arms **36** are swung upwardly and rearwardly to in turn move the rollers **42** along an arcuate path extending upwardly about the trunnion supports **38**.

A container 52 of a type adapted to be dumped with the attachment 10 is illustrated in FIGS. 1 and 3 as being much longer than it is wide. The container 52 includes a body 54 which is of a trapezoid shape when viewed from the side, being larger at its upper end 56 than at its lower end 58, and is supported on ground wheels 60. A pair of covers 62 are arranged side by side and are pivotally mounted on the open top end 56 of the container 52. When the container 52 is open, the covers 62 hang downwardly, as illustrated in FIG. 1, along side the vertical rear side 64 of the container 52.

On the front side 70 of the container, the body 54 carries a horizontal rod 72 which extends the entire length of the body 54 and has end portions 74 which project outwardly beyond the ends of the body 54. The rod 72 is secured, such as by welding, to the container body 54 adjacent the upper end 56 thereof. Each end portion 74 carries a pair of vertical retainer disks 78, with the disks in each pair being spaced a predetermined distance apart and with the pairs 78 being also spaced a predetermined distance apart. The container body 54 is of a length at its upper end slightly less than the length of the loader trough 22 (FIG. 5) so that it can be easily dumped into the trough. The height of the container 54 is such that with the wheels 60 ground-supported at the rear end of the truck, the rod 72 is positioned above a horizontal flange or lip 80 at the upper rear edge of the trough 22 (FIG. 3).

In order to provide a pivot support about which the container 52 can rotate during dumping, a pair of container support brackets 82 are secured to opposite sides of the tail-gate structure 20. The side walls 86 of the tail-gate 20 are provided at their rear edges with channel-shape beads 84 which constitute the sides of a loading opening 88 through which a container must be moved when refuse is dumped into the trough 22. Each support bracket 82 includes an upright angle member 90 secured to the channel bead 84 on the corresponding side of the tail-gate 20 as shown in FIG. 4. A first vertical plate member 92 is secured to the angle member 90 and projects rearwardly therefrom. The plate 92 has a central cut-away or recessed portion 94 for a purpose to appear later and is positioned so that its upper end is substantially level with the top end of the angle member 90. A pair of plate members 96 are secured to and arranged on opposite sides of the plate member 92 at a position below the cut-away portion 94. The plates 96 are also secured to the angle member 90 and carry a pin 98, extended between the plates 96 for supporting an upright locking lever 100 which has its lower end positioned between the plates 96. A pair of latch levers 102 arranged on opposite sides of the plate 92 at a position above the cut-away portion 94, are pivotally connected at their inner ends to the plate 92 by a pin 104. The outer ends of the latch levers 102 are connected by a latch pin 107.

The locking lever 100 is movable about the pin 98 between the locking and unlocking positions shown in solid and broken lines, respectively, in FIG. 3. In the locking position of the locking lever 100, the lever cooperates with the plate 92 to provide what constitutes an enclosed upright slot 106 between the locking lever 100 and the cut-away portion 94 of the plate 92. On movement of the locking lever 100 to the unlocking position shown in broken lines, the slot 106 is open at its rear side for movement of a part into and out of the slot 106.

In mounting the pivot support brackets 82 on the tail-gate structure 20, the brackets 82 are located so that the lower end of each slot 106 is spaced above the supporting ground surface for the truck a distance substantially equal to or only slightly less than the height of the container pivot rod 72 above the ground surface when the truck is in an unloaded condition. With this spacing arrangement, the container 52 is movable horizontally toward the brackets 82 to position the rod end portions 74

in the lower ends of the slots 106 as shown in FIG. 3. The locking levers 100 and the latching levers 102 are then manipulated to lock the rod 72 in a position confined within the slots 106.

As the truck 12 is loaded with refuse, the upright slots 106 will of course be moved downwardly toward the ground surface. Consequently, the slots 106 are provided in sizes such that in a fully loaded condition of the truck 12, a container pivot rod 72 is still movable horizontally into the slots 106. Under such conditions, the rod 72 will of course be located adjacent the top ends of the slots 106.

In the use of the apparatus 10 to dump a container, the container rod 72 is first locked in the slots 106, in the manner described above. A control handle 110, positioned on one of the tail-gate walls 86 adjacent the panel control handles 30 and 32, operates a control valve (not shown) mounted on the tail-gate 20 for supplying fluid under pressure to the cylinder assemblies 46. The control valve may be connected to a separate hydraulic pump but it is preferably connected, for cost reduction purposes, through a flow divider to a pump for operating the motor which moves the sweep panel 24.

However, before manipulating the handle 110 to provide for dumping of the container 52, a shield assembly 114 (FIGS. 3 and 7) is moved to the operative position shown in solid lines in FIG. 7 in which it constitutes an upward extension of the rear side edge of the trough 22. The shield assembly 114 is necessitated by the fact that a container 52 is higher than the trough 22 when the container is positioned adjacent the trough 22.

The shield assembly 114 includes a pair of shield sections 116 and 117 which are connected by a hinge member 118. The shield section 116 consists of a plate member 120 bent along a line extending longitudinally thereof so that the plate has a pair of downwardly diverging leg portions 122 and 124. Triangular shaped reinforcing members 126 are secured to and extend between the leg portions 122 and 124 at positions spaced longitudinally of the plate 126. Three of the reinforcing members 126 (FIG. 5) located generally at the ends and center of the lower shield section 116 are rigidly connected to one of the ends of three bracket arms 128 (only the outer two of which are illustrated) which are connected at their opposite ends by pivots 131 to downwardly extending ears 130 on a reinforcing frame member 132 for the hopper flange 80.

Each of the outer two bracket arms 128 is formed intermediate its ends with a slot 134 which is positioned in horizontal alignment with a shield locking pin 136 in the operative position of the shield assembly 114 illustrated in FIG. 3. Each locking pin 136 is mounted in a housing 138 secured to the reinforcing frame member 132, and is urged by a spring 141 extended between a cover 143 on the housing 138 and a stop ring 146 on the pin, to a position extending into the adjacent arm slot 134. At its inner end each pin is provided with a transversely extending handle 145 which is operable to rotate the pin 136 within its housing 138. On rotation of the handle 145 from a position extending downwardly to a position extending rearwardly, the handle 145 rides on a cam-shape edge 148 of a plate 150 secured to the housing 138 so as to retract the pin 136 from the adjacent slot 134.

The outer pair of bracket arms 128 carry pins 140 which project outwardly in directions away from the center line of the vehicle 12. Each pin 140 is connected to the lower end of a spring 142, the upper end of which is connected to a pin 144 secured to the shield section 117 and located in the vertical plane of the pin 140. Each pin 144 is located between the hinged and free ends of the upper shield section 117 as illustrated in FIG. 7. The springs 142 maintain the section 117 in a position against stop pins 148 (FIGS. 3 and 4) on the bracket assemblies 82 in the position of the shield section 117 in which it extends upwardly from the hinge 118.

The shield section 117 is readily movable in a forward direction about the hinge 118 to a folded position against the leg 124 of the shield section 116. The springs 142 act to maintain the section 117 in this position. On movement of the locking pin handles 145 to rearwardly extending positions, to retract the pins 136 from the slots 134, the entire shield assembly 114 is swingable downwardly about the pivots 131 to a lower or inoperative position in which it is out of the way during operation of the loader 18 in a conventional manner without using the attachment 10.

During downward swinging movement of the shield assembly, the shield section 116 engages the handles 145 and swings them downwardly to positions in which they are also out of the way and do not project rearwardly so as to constitute a hazard to the pickup men loading the hopper 22. The lift unit 34 is temporarily moved to a rearwardly extending position during downward swinging movement of the shield assembly 114 so that the lift unit is out of the way. When the shield assembly 114 has been swung downwardly adjacent the rear side of the trough 22 as shown in FIG. 3, the lift unit 34 is retracted to a position in which the rollers 42 contact the shield assembly 114 and act to hold it in a position against the channel reinforcing frame member 132, as shown in broken lines in FIG. 3.

Assuming that the container 52 is in the position illustrated in FIG. 1 and that the shield assembly 114 has been moved to the operative position shown in FIG. 7, the control handle 110 is moved to a "raise" position for opening the associated control valve (not shown) and supplying fluid under pressure to the cylinder assemblies 46 for extending the piston rods 48. On extension of the piston rods 48, the lift unit 34 is swung upwardly and rearwardly so that the rollers 42 engage the front wall 70 of the container 52 and act to swing the container upwardly about the rod 72 as a pivot, as shown diagrammatically in FIGS. 9 and 10 in which the arrow 150 indicates the location and direction of the forces applied to the container 52 by the rollers 42 and the cross and arrow indicia 152 indicates the approximate location of the center of gravity of the container 52. It is appreciated that the exact location of the center of gravity 152 of the container 52 when loaded varies with the extent and character of the loading and shifts during shifting of the refuse. However, this variation and shifting does not affect the principles of operation hereinafter described since it only changes the precise time at which the various actions occur.

During upward swinging movement of the container 52, the rod 72 is progressively moved upwardly in the slots 106 in the brackets 82, since the lifting force 150 is located closer to the rod 72 than is the center of gravity 152, until the rod 72 engages the plates 92 at the top ends of the slots 106 as shown in FIG. 10. By maintaining the handle 110 in the "raise" position providing for a continuous flow of fluid under pressure to the hydraulic cylinder assemblies 46, the operator continues the lifting operation and refuse travels from the container 52 into the loading trough 22 as soon as the container has been tipped to a position (FIG. 11) in which refuse from the container can flow downwardly. When the container has been moved to the position shown in FIG. 11, in which the center of gravity 152 is immediately to the right of a position in vertical alignment with the litfing force exerted on the container by the lift arm unit, the container 52 abruptly falls downwardly until the rod 72 engages the plates 92 at the lower ends of the slots 106. This engagement of the rod 72 with the plates 92 suddenly stops the downward movement of the container so that the remaining refuse is forcibly dislodged. The rotation of the container 52 in a clockwise direction as viewed in FIG. 11 is continued by operation of the lift unit 34 until the container is in a completely inverted position such as illustrated in FIG. 12 so that all the refuse therein falls into the trough 22.

An ejector mechanism 154 (FIGS. 1, 2, 11 and 12) mounted in the tail-gate structure 20 above the loading opening 88 has a plunger mounted roller 156 which engages one of the covers 62 at the rear side of the container 52 immediately prior to movement of the container to a position in which the center of gravity 152 is vertically aligned with the rod 72. The mechanism 154 acts to continually urge a container 52 being dumped to a position in which the center of gravity 152 is rearwardly of the rod 72 in which position the weight of the container acts to return it to a ground-supported position.

The ejector mechanism 154 (FIGS. 2 and 8) consists of a mounting member 162 secured to a downwardly and rearwardly extending rear wall 160 of the tail-gate structure 20 above the opening 88. A channel-shaped supporting plate 163, secured at its upper end to the mounting member 162, has a pair of downwardly and forwardly inclined parallel legs 170 which are spaced apart in a direction longitudinally of the vehicle 12. The legs 170 slidably support a plunger 172 which carries the roller 156 at its rear end. A spring 174 is positioned on the plunger 172 and extends between the forward leg 170 on the plate 168 and a stop washer 176 mounted on the plunger 172. The plunger 176 is secured to the plunger 172 by a pin 178 extended through one of a plurality of openings 180 formed in the plunger 172. The plurality of openings 180 provide for an adjustment of the position of the roller 156 to adapt it to the location of the brackets 82, the location of which varies with different truck chassis heights, as previously described.

Since the loaded container engages the ejector roller 156 immediately prior to a location of the center of gravity 152 above the rod 72, further upward movement of the container moves the plunger 172 in a direction forwardly of the vehicle so as to move the washer 176 toward the front support plate leg 170 to compress the spring 174. The spring 174 is in its maximum compressed condition in the fully dumped position of the container 52 illustrated in FIG. 12.

As soon as the container has been emptied and the operator has moved the handle 110 in a reverse direction to a "reverse" position, a flow of fluid under pressure to the cylinder assemblies 46 is provided which retracts the piston rods 48 and provides for swinging of the lift arm unit 34 in a counterclockwise direction as viewed in FIGS. 9 to 12. The spring 174 urges the ejector roller 156 in a direction such that the roller 156 exerts a force on the container 52 acting to likewise swing the container 52 in a counterclockwise direction and maintain it against the lift rollers 42. When the left arm unit 34 has been returned to its initial position illustrated in FIG. 1, corresponding to fully retracted positions of the piston rods 48, the container 52 is returned to its ground-supported position so that the brackets 82 can be manipulated to release the container 52.

The panels 24 and 26 are then usually operated to transfer the refuse from the trough 22 into the refuse storage compartment. However, in the event that several containers are to be dumped at a single location of the truck 12 or at several closely spaced stops of the truck 12, it may be possible to empty several containers into the trough 22 before the trough 22 is sufficiently full to require operation of the refuse handling panels 24 and 26. In such case, successive containers are dumped one after the other without any intervening operation of the panels 24 and 26. In the event thetrough 22 becomes loaded before a container 52 has been completely emptied, but after the container has been raised to the position illustrated, for example, in FIG. 11 so that some refuse has been emptied from the container into the trough 22, the control handle 110 is moved to the "reverse" position to swing the lift unit 34 in a counterclockwise direction as viewed in FIG. 11 to return the container to a sub-

stantially horizontal position so that no more refuse will fall from the container into the trough. The handle 110 is then moved to a "hold" position so that the fluid in the cyilnder assemblies 46 is locked therein so as to maintain the container 52 in its substantially horizontal position.

The control handle 30 for the loader 18 is then operated to initiate transfer of the refuse from the loaded trough 22 into the truck storage compartment. After the transfer operaion has been completed, the handle 110 is again moved to the "raise" position to return the container 52 to its dumping position and complete the emptying of refuse therefrom into the trough 22.

It can thus be seen that since the operation of the attachment 10 is substantially independent from the operation of the loader 18, a return of the container 52 to a ground-supported position is not required during operation of the loader 18. Accordingly, the emptying of containers into the trough 22 is accomplished without any unnecessary delay. Since two pickup men are customarily associated with each truck 12, they can operate from opposite sides of the truck 12 to readily manipulate the brackets to connect the containers 52 to the brackets and disconnect the containers from the brackets.

It will be understood that the specific construction of the improved container dumping attachment or similar material handing apparatus which is herein disclosed and described is presented for purposes of explanation and illustration and it not intended to indicate limits of the invention, the scope of which is defined by the following claims.

What is claimed is:

1. A container dumping attachment for dumping refuse from the open upper end of a container into a loading through on a refuse collecting truck, comprising a pair of axially aligned pivot member portions mounted on one side of the container adjacent its open end, a pair of bracket assemblies adapted to be mounted on the truck and having slots formed therein at positions in substantially horizontal alignment with said pivot member portions when the container is in a ground-supported position adjacent the truck, each of said bracket assemblies including means for releasably locking one of said pivot member portions in a slot, a pair of lift arms adapted to be mounted on opposite sides of the truck for concurrent up and down swinging movement, a connecting member connected to and extending between said arms, roller members on said connecting member positioned so that they are engageable with a ground-supported container which is connected to said bracket assemblies when said lift arms are swung upwardly, the container being swingable upwardly to an inverted position over the loading trough on the truck to provide for a downward flow of refuse from the container into the loading trough, and said lift arms being movable upwardly a distance sufficient to position the center of gravity of the container and the refuse therein in a vertical plane between the vertical planes of said pivot member portions and the points of engagement of said rollers with the container, so that the container will fall downwardly to a position in which said pivot member portions engage said bracket assemblies at the lower ends of said slots to forcibly dislodge refuse from the container.

2. A container dumping attachment for dumping refuse from a container having an open upper end into a loading trough on a refuse collecting truck, comprising a pair of spaced lift arms adapted to be mounted on the truck for up and down swinging movement about a horizontal axis, connecting means extending between said lift arms and disposable forwardly of a ground-supported container, extensible means adapted to be mounted on the truck and pivotally connected to said lift arms for swinging said lift arms upwardly on extension of said extensible means, and means adapted to be attached to the truck for pivotally connecting the ground-supported container to the truck in a position in which said connecting means is engageable with a portion of the container below said pivotal connection on upward swinging movement of said lift arms for inverting the container above the loading trough.

3. A container dumping attachment for a refuse collecting truck having a rear end tail-gate structure provided with a loading trough, comprising pivot means adapted to be attached to said tail-gate structure, lift arm means mounted on said pivot means for up and down swinging movement about a horizontal axis, a bracket adapted to be fixedly attached to said tail-gate structure adjacent said pivot means for holding a container and providing a horizontal axis about which the container is rotatable on upward swinging of said lift arm means, said bracket defining a fixed, substantially vertical elongated slot and including means operable to open and close the rear side of said slot so that a part on a ground-supported container is movable horizontally into said slot and is retainable therein.

4. A container dumping attachment for dumping refuse from a container having an open upper end into a loading trough on a refuse collecting truck, comprising a pair of lift arms adapted to be mounted on the truck at opposite ends of the trough for rotation about a horizontal axis, means connected to and extending between said lift arms at a position engageable with the container when the container is positioned adjacent the outer side of the trough and said lift arms are swung upwardly in one direction for swinging the container upwardly from a ground-supported position to an inverted position above the trough, and coacting means adapted to be connected on the container and the truck for releasably pivotally connecting the container to the truck at a position adjacent to and above the trough so as to provide a horizontal axis about which the container is swingable to its inverted position, said coacting means including pivot members and slot means adapted to receive each of said pivot members with said pivot members engaging one end of said slot means during the initial portion of said swinging movement to said inverted position in such a manner that the container will fall downwardly following further swinging movement toward said inverted position thereby causing said pivot members to engage the opposite end of said slot means to forcibly dislodge refuse from the container.

5. A container dumping attachment for dumping refuse from a container having an open upper end into a loading trough on a refuse collecting truck, comprising lift means adapted to be mounted on the truck for rotation about a horizontal axis at a position engageable with the container when the container is positioned adjacent the loading trough on the refuse collecting truck for swinging the container upwardly from a ground-supported position to an inverted position, and coacting means adapted to be connected on the truck and the container for releasably pivotally connecting the container to the truck so as to provide a horizontal axis about which the container is swingable to its inverted position, said coacting means including pivot members and slot means adapted to receive each of said pivot members with said pivot members engaging one end of said slot means during the initial portion of said swinging movement to said inverted position in such a manner that the container will fall downwardly following further swinging movement toward said inverted position thereby causing said pivot members to engage the opposite end of said slot means to forcibly dislodge refuse from the container.

6. A container dumping attachment for dumping refuse from a ground-supported container having an open upper end into a loading trough on a refuse collecting truck, comprising a pair of axially aligned pivot member portions positioned on one side if the container adjacent its open end, a pair of bracket assemblies adapted to be mounted on the truck and having slots formed therein at positions in substantially horizontal alignment with said pivot member portions when the container is in a

ground-supported position adjacent the truck, each of said bracket assemblies including means for releasably locking one of said pivot member portions in a slot, a pair of lift arms adapted to be mounted on opposite sides of the truck for concurrent up and down swinging movement, a connecting member connected to and extending between said arms, roller members on said connecting member positioned so that they are engageable with a ground-supported container which is connected to said bracket assemblies when said lift arms are swung upwardly, the container being swingable upwardly to an inverted position over a portion of the truck to provide for a downward flow of refuse from the container into the loading trough on the truck, said lift arms being movable upwardly a distance sufficient to position the center of gravity of the container and the refuse therein in a vertical plane between the vertical planes of said pivot member portions and the points of engagement of said roller members and the container, so that the container will fall downwardly to a position in which said pivot members engage said bracket assemblies at the lower ends of said slots to forcibly dislodge refuse from the container, ejector means adapted to be mounted on the truck to be engageable with the container in the inverted position thereof for urging the container in a direction opposite to the direction of dumping thereof to a position in which the center of gravity of the empty container is located in a vertical plane to one side of the vertical plane of said pivot member portions in a position in which the weight of the container maintains it in engagement with said roller members during return movement of said lift arms in a direction opposite to the direction of movement thereof during dumping of the container.

7. A container dumping attachment for dumping refuse from the open upper end of a container into a loading trough on a refuse collecting truck, comprising lift means adapted to be mounted on the truck for rotation about a horizontal axis and engageable with the container for swinging the container upwardly from a ground-supported position rearwardly of the loading trough on the truck to an inverted position over the loading trough on rotation of said lift means in one direction, coacting means adapted to be connected to the container and the truck for releasably pivotally connecting the container to the truck so as to provide a horizontal axis about which the container is swingable by said lift means to an inverted position in which the center of gravity of the container is forwardly of said horizontal pivot axis for the container, ejector means adapted to be mounted on the truck to be yieldably engageable with the container when it is in an inverted position in which its center of gravity is rearwardly of said horizontal pivot axis for urging the container to said last mentioned position on rotation of said lifting means in an opposite direction to return the container to its ground-supported position.

8. A container dumping attachment for dumping refuse from the open upper end of a container into a loading trough on a refuse collecting truck, comprising a pair of axially aligned pivot member portions positioned on one side of the container adjacent its open end, a pair of bracket assemblies adapted to be mounted on the truck and having slots formed therein at positions in substantially horizontal alignment with said pivot member portions when the container is in a ground-supported position adjacent the truck, each of said bracket assemblies including an upright pivotally mounted member which forms the rear side of one of said slots in one position and is movable to a second out of the way position in which the rear side of the slot is open, and lift means adapted to be mounted on the truck at a point spaced from said bracket assemblies for up and down swinging movement, said lift means being engageable with the ground-supported container having said pivot member portions thereon retained in said slots in said bracket assemblies when said lift means is swung upwardly to move the container upwardly to an inverted position over the loading trough on the truck to provide for a downward flow of refuse from the container into the loading trough.

9. A container dumping attachment for dumping refuse from the open upper end of a container into a loading trough on a refuse collecting truck, comprising a pair of axially aligned pivot member portions on one side of the container adjacent its open end, means adapted to be mounted on the truck in substantially horizontal alignment with said pivot member portions when the container is in a ground-supported position adjacent the truck for releasably connecting said pivot member portions to the truck, a pair of lift arms adapted to be mounted on opposite sides of the truck for concurrent up and down swinging movement, means connected to and extending between said arms engageable with the ground-supported container connected to the truck when said lift arms are swung upwardly, the container being swingable upwardly to an inverted position over the loading trough on the truck to provide for a downward flow of refuse from the container into the loading trough, plunger means adapted to be mounted on the truck above the loading trough for engagement with the container in the inverted position thereof, and spring means operatively associated with said plunger means for urging said plunger means in a direction to exert a force on the container in a direction acting to move the container in a direction opposite to the direction in which the force of gravity acts to move the container to maintain it in engagement with said lift means at all times when the force of gravity on the container tends to move it in a direction opposite to the direction of movement of said lift means.

10. A container dumping attachment for dumping refuse from the open upper end of a container into a loading trough on a refuse collecting truck, comprising lift means adapted to be mounted on the truck for rotation about a horizontal axis at a position engageable with the container when the container is positioned adjacent the loading trough of the truck for swinging the container upwardly from a ground-supported position to an inverted position, and coacting means adapted to be connected on the truck and the container for releasably connecting the container to the truck, said coacting means including arm portions and slot means adapted to receive each of said arm portions with said arm portions engaging one end of said slot means during the initial portion of said swinging movement to said inverted position in such a manner that the container will fall downwardly following further swinging movement toward said inverted position thereby causing said arm portions to engage the opposite end of said slot means to forcibly dislodge refuse from the container.

11. A container dumping attachment for dumping refuse from the open upper end of a container into a loading trough on a refuse collecting truck, comprising a pair of axially aligned pivot member portions mounted on one side of the container adjacent its open end, a pair of bracket assemblies adapted to be mounted on the truck and having slots formed therein at positions above the top edges of the loading trough and in substantially horizontal alignment with said pivot member portions when the container is in a ground-supported position adjacent the loading trough, each of said bracket assemblies including means for releasably locking one of said pivot member portions in a slot, lift means adapted to be mounted on the truck for upward swinging movement into engagement with the ground-supported container connected to said bracket assemblies for moving the container upwardly to an inverted position over the loading trough on the truck to provide for a downward flow of refuse from the container into the loading trough, a shield assembly adapted to be movably mounted on the trough for movement to a position extending upwardly from one of the edges of the trough when the container is being dumped and to a position below the last mentioned one edge of the trough when said shield assem-

bly is not in use, and ejector means adapted to be mounted on the truck above the loading trough for engagement with the container when it is in an inverted position for urging the container in a direction opposite to the direction of dumping thereof to a position in which the force of gravity on the container tends to move it in a reverse direction to its original ground-supported position.

12. In a refuse collecting truck the combination of a substantially horizontal loading trough having an outer side and an inner side and into which refuse to be transported by the truck is deposited, a shield assembly mounted on said trough, said shield assembly comprising a first shield member, supporting members for said first shield member pivotally mounted on said trough for up and down swinging movement to move said shield member between a first position extending upwardly from the top edge of said outer trough side and a second position below said top edge, a second shield member hingedly mounted on said first shield member for movement between an extended position projecting upwardly from said first member in the first position thereof and a folded position against said first member, and co-acting pin and slot means on said trough and said supporting members for releasably maintaining said first shield member in said first position.

13. In a refuse collecting truck the combination of a substantially horizontal loading trough having an outer side and an inner side and into which refuse is deposited, a shield assembly mounted on the trough, said assembly including a shield member, a pivot on the bottom of said trough, bracket means on said pivot connected to the rearward portion of said shield member, said bracket means being swingable up and down on said pivot to move said shield member between a first position extending upwardly from the top edge of said outer trough side and a second position below said top edge, means defining a slot in said shield member, and means on said trough releasably engaging said slot for releasably maintaining said shield member in said first position.

14. In a refuse collecting truck the combination of a substantially horizontal loading trough having an outer side and an inner side and into which refuse to be transported by the truck is deposited, a shield assembly mounted on said trough, said shield assembly comprising a first shield member, supporting members for said first shield member pivotally mounted on said trough for up and down swinging movement to move said shield member between a first position extending upwardly from the top edge of said outer trough side and a second position below said top edge, a second shield member hingedly mounted on said first shield member for movement between an extended position projecting upwardly from said first member in the first position thereof and a folded position against said first member, and co-acting means on said trough and said supporting members for releasably maintaining said first shield member in said first position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,963,288	Ballert	June 19, 1934
2,151,887	Barrett	Mar. 28, 1939
2,160,815	Baker	June 6, 1939
2,661,855	Jorgenson	Dec. 8, 1953
2,683,543	Linde	July 13, 1954
2,828,032	Beasley et al.	Mar. 25, 1958
2,860,795	Zoller	Nov. 18, 1958
2,900,096	Dempster et al.	Aug. 18, 1959
2,928,562	Gollnick	Mar. 15, 1960

FOREIGN PATENTS

447,898	Germany	Aug. 3, 1927
687,564	Great Britain	Feb. 18, 1953