

July 20, 1965

N. F. WENDER
VEHICLE BODIES

3,195,744

Filed Aug. 16, 1961

4 Sheets-Sheet 1

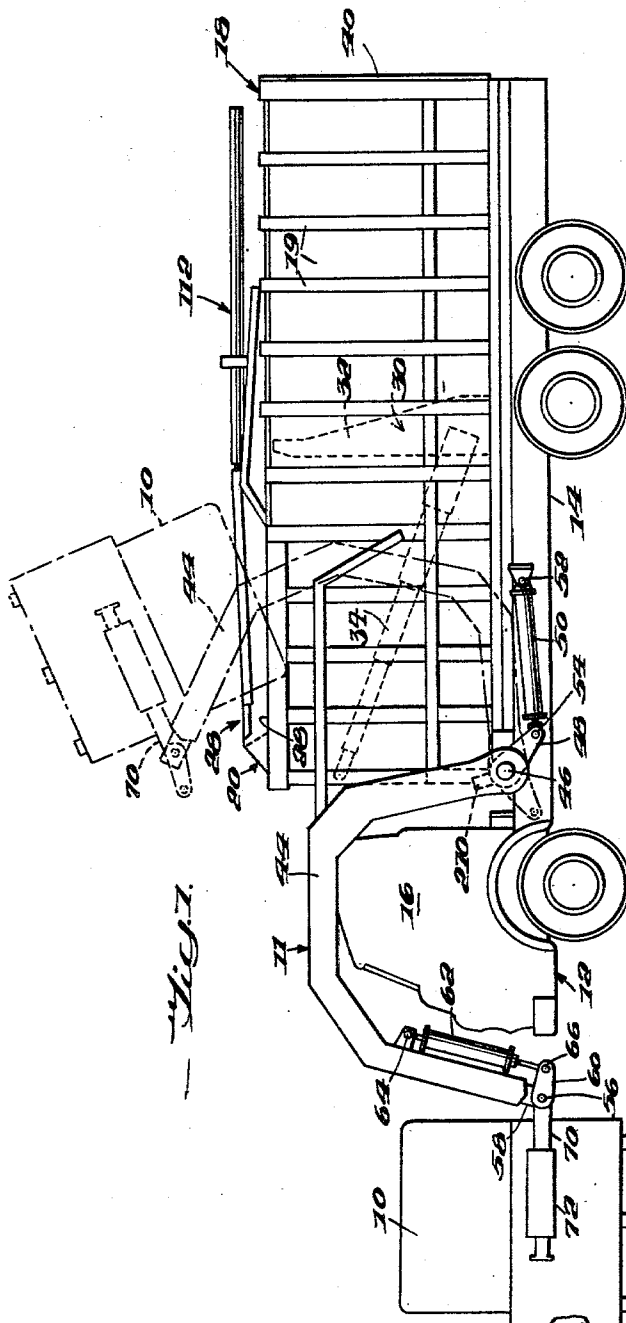


Fig. 1

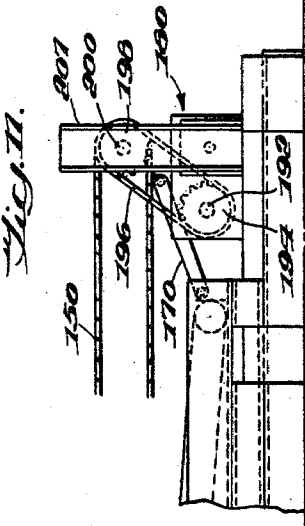


Fig. 11

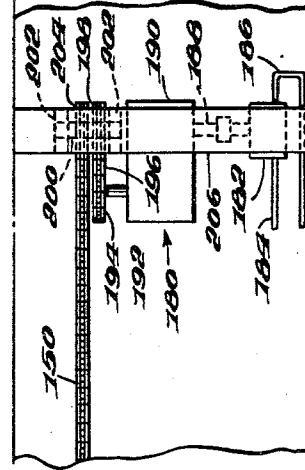


Fig. 10

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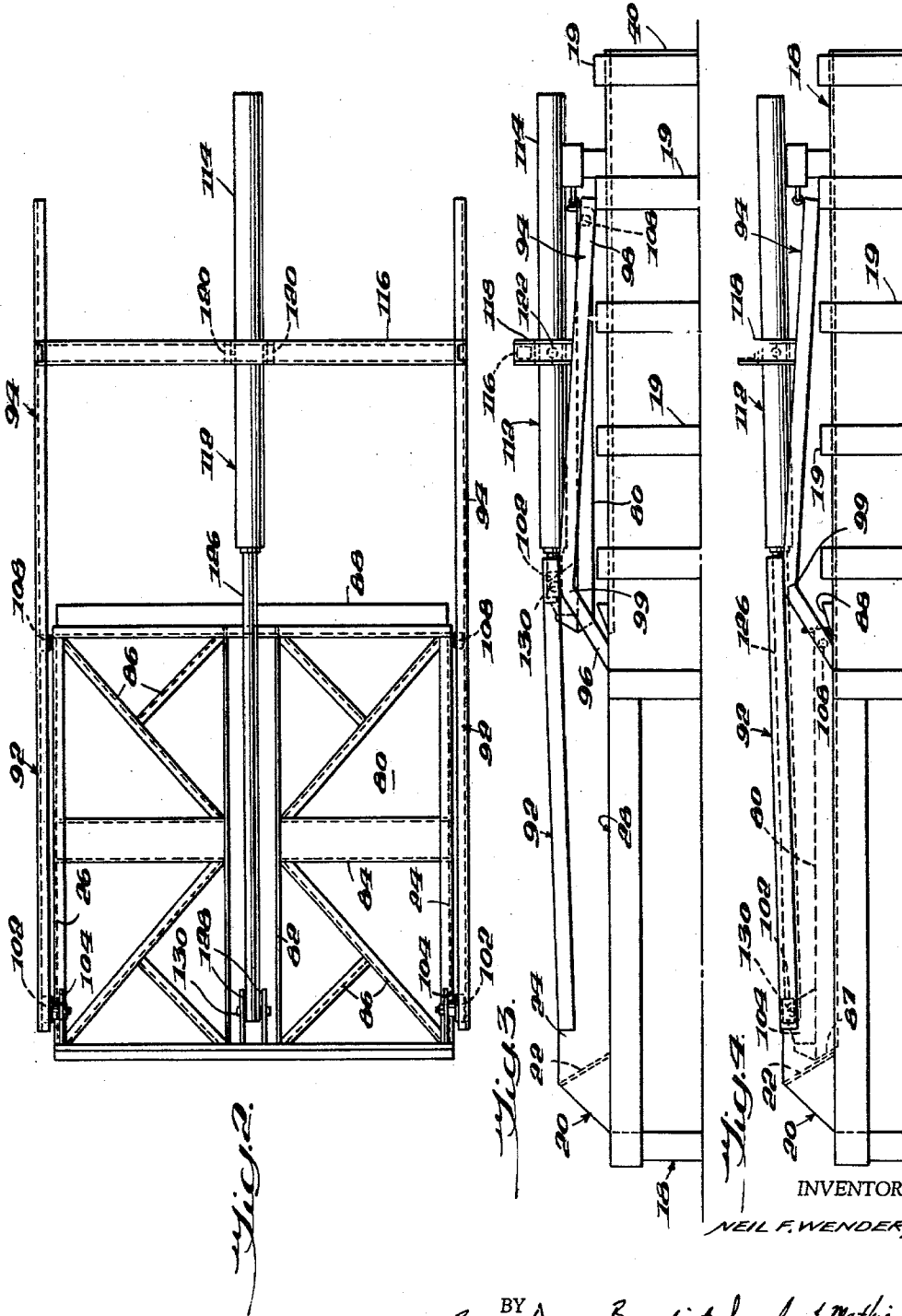
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4 Sheets-Sheet 2



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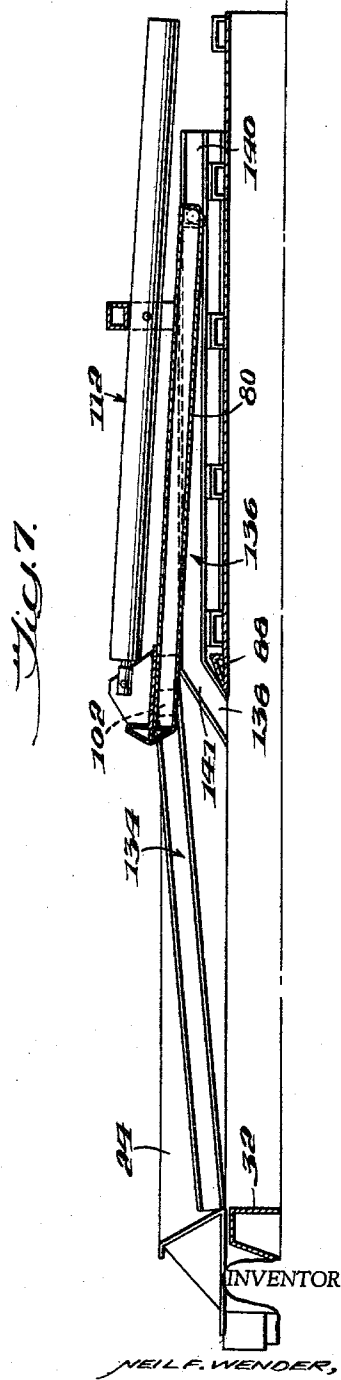
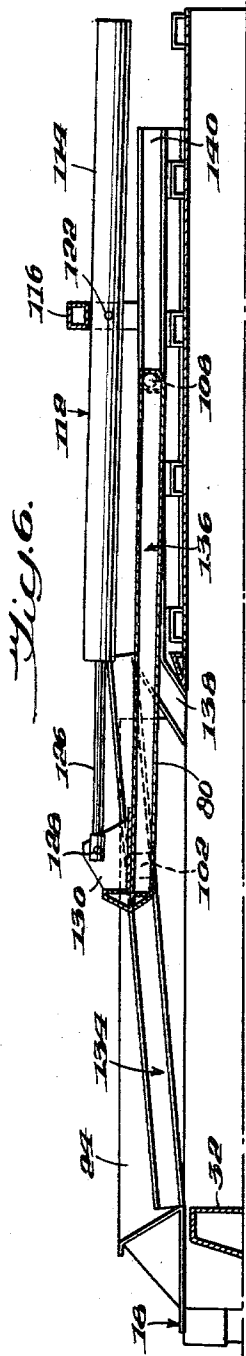
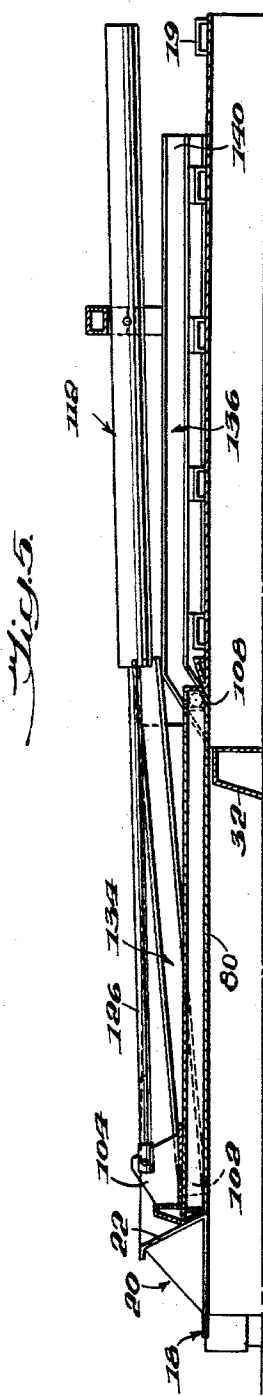
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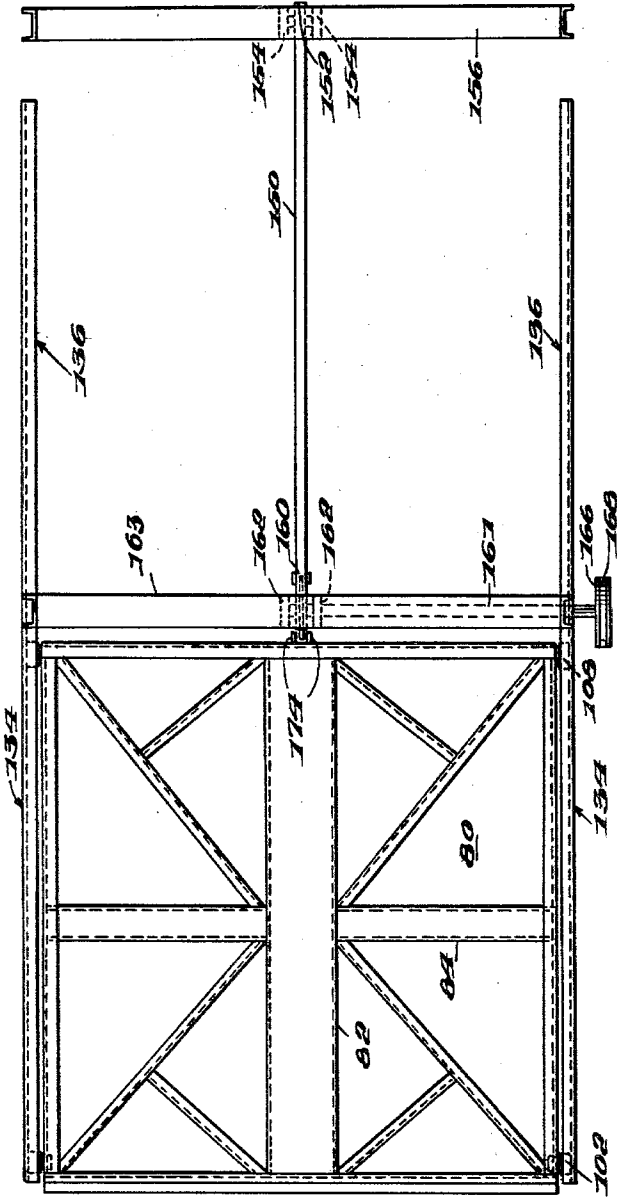


Fig. 8.

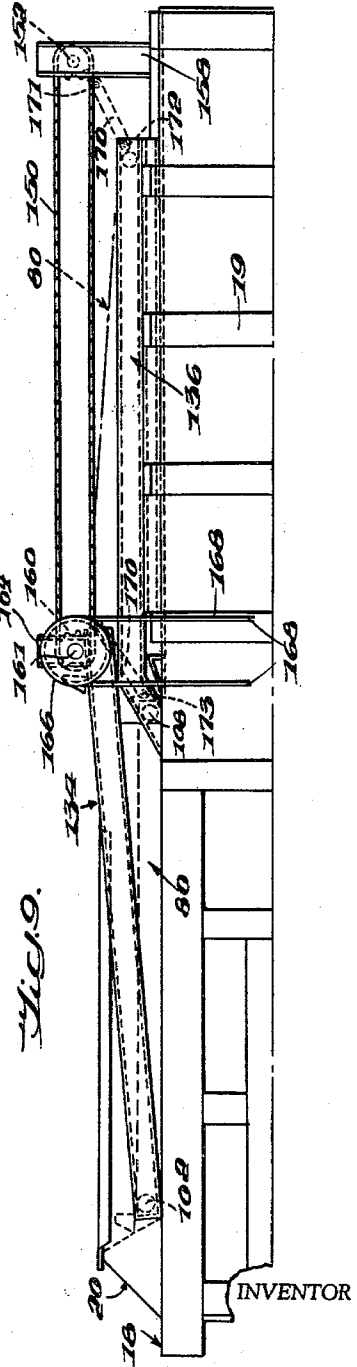


Fig. 9.

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7 Claims. (Cl. 214—82)

This invention relates to improvements in vehicle bodies, and more particularly, to a cover for a hopper opening in a vehicle body.

In the past, a satisfactory way for handling loose material has been to place the material in large-size containers and then from time to time, as the containers become full, empty the containers into the body of a transporting vehicle. The vehicle is normally provided with hoisting apparatus for lifting the containers above the body of the vehicle so that the contents of the containers can be dumped into the body. After the body of the vehicle is full, the vehicle is driven to a location where the contents are emptied from the body.

In providing a suitable vehicle body for receiving material from containers in this manner, it is customary that a hopper be provided at the top of the body. The hopper aids in directing the material through an opening in the top of the body as the material falls from the containers. It is desirable that the opening at the top of the body be equipped with a suitable door or cover.

In the past, many problems and difficulties have been encountered in providing a suitable cover for the opening in the vehicle body of this type. The openings provided in such bodies must necessarily be large so as to receive the material as it falls from large-size containers. Consequently, the covers for such openings are large-size and often extremely heavy. It is necessary to employ suitably powerful mechanism for opening and closing the cover, and this mechanism must in no way obstruct the opening. Furthermore, the mechanism must be capable of ensuring that the cover is properly aligned with cooperating structure on the vehicle body when the cover is in its closed position.

In this type of vehicle body, it is customary to use compaction apparatus inside the body for compressing the material within the body. Such compaction apparatus normally employs a compaction head which moves back and forth to compress the material at one end of the body. The compaction head ordinarily moves past the opening in the top of the body in pushing the material toward one end of the body. It is customary, for efficient operation, to make the compaction head the same dimensions as the cross-sectional dimensions of the inside of the vehicle body.

Accordingly, it is desirable that the cover for the opening be flush with the inside of the top of the vehicle body so that, as the head pushes the material toward one end of the body for compaction, the material will not spill over the head. If the cover did not fit flush with the inside of the top of the vehicle body, a space would be left for material to fall over the compaction head and lodge behind the head rather than being pushed toward the end of the body for compaction.

It is often necessary that covers for openings in the top of the vehicle bodies have a low clearance. These vehicle bodies are generally relatively high and it is not always possible that a cover for the opening be able to swing upwardly for a distance above the top of the vehicle body. The problem of providing a suitable cover for the opening in a vehicle body wherein material is dumped from containers above the vehicle body is further made difficult by the fact that the material often piles up and hinders the complete closing of the cover, or clogs the

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mechanism which actuates the cover. It is necessary, therefore, to employ an arrangement which is not affected by an accumulation of the material around the opening.

Accordingly, it is one object of this invention to provide a suitable cover for an opening in the top of a vehicle body of the type adapted to receive loose material dumped from a container.

Another object of this invention is to provide a cover for an opening in a vehicle body, which cover fits tightly within the opening and which is easily aligned with the cooperating structure on the vehicle body.

Another object of this invention is to provide mechanism for moving the cover to open and closed positions, which mechanism does not obstruct the opening and which is not impeded by the accumulation of material around the opening.

Another object of this invention is to provide a cover for an opening in a vehicle body which cover has relatively low clearance and which does not protrude a substantial distance above the top of the body.

Another object of this invention is to provide a cover for an opening in the top of a vehicle body which cover fits flush with the inside of the top of the vehicle body and which can be moved out of said opening in a relatively easy manner.

These objects may be accomplished according to one embodiment of this invention by providing a cover which is slidable generally in a horizontal direction into and out of an opening in the top of a vehicle body. In the embodiment illustrated and described, the opening is located at the front of the body, although the opening could be at the rear. Normally, the opening is rectangular in shape and the cover is of the same configuration. Movement of the cover to open and closed positions is guided by a track arrangement located along the sides of the opening and extending as far as necessary along the top of the vehicle body. Movement of the cover is controlled by a suitable actuating mechanism which may be hydraulically powered or hand manipulated.

The track arrangement includes two separate pairs of tracks in the form of channels which are specially shaped to control the movement of the cover into and out of the opening. A first pair of support members, blocks for example, are fixed on the front of the cover and fit into the front pair of tracks. A second pair of support members, rollers for example, are fixed on the rear of the cover and fit into the rear pair of tracks.

The mechanism for moving the cover may be in the form of a conventional cylinder and piston arrangement or may be in the form of an endless chain. The mechanism is located at the top and in the center of the vehicle body and can be actuated to pull or push the cover toward the front of the vehicle or toward the rear of the vehicle. The pairs of tracks are arranged and shaped so as to lift the cover in guided movement out of the opening as the mechanism is actuated to move the cover to its open position. Similarly, the pairs of tracks are arranged to move the cover in guided movement downwardly into the opening as the mechanism is actuated to move the cover to its closed position. The cover moves toward and away from the opening in a sliding or gliding fashion.

The embodiments of the invention are illustrated in the accompanying drawings, in which:

FIG. 1 is a side elevation view of a vehicle equipped with a container hoisting apparatus and having a body thereon for receiving material from the container;

FIG. 2 is a plan view of a cover for an opening in a vehicle body showing the cover in connection with the guiding tracks and a power device;

FIGS. 3 and 4 are side elevation views of the top por-

tion of a vehicle body showing the cover of FIG. 2 in open and closed positions, respectively;

FIGS. 5, 6 and 7 are side elevation views showing a modified cover arrangement for an opening in a vehicle body;

FIG. 8 is a plan view showing a hand-operated endless chain mechanism for actuating a cover;

FIG. 9 is a side elevation view corresponding with FIG. 8;

FIG. 10 is fragmentary plan view showing a power arrangement for actuating an endless chain which moves a cover; and

FIG. 11 is a side elevation view corresponding with FIG. 10.

In FIG. 1 there is illustrated a front end loader type or hoisting apparatus which may be employed for servicing a container 10. The container 10 may be of any suitable size and shape necessary for receiving the material to be handled. Normally, the container 10 is of closed, box-type construction having suitable openings at the top and sides thereof through which the material may be placed in the container. The top of the container 10 is provided with an opening for dumping the material out of the container. The hoisting apparatus is designated by reference numeral 11 and may be mounted on a vehicle 12 having a chassis frame 14. The vehicle is self-propelled under the control of an operator located within a cab 16.

A body 18 is mounted on the chassis frame 14 behind the cab 16 and may be of any suitable type for receiving the particular material to be handled. Generally, the body 18 will be built up of plate sections and reinforced as necessary with a series of ribs 19 which extend along the sides and across the top of the body 18. The body 18 is provided with a hopper 20 at the front and top thereof for receiving and guiding material from the container 10 when the container is inverted to dump the contents thereof into the body 18. The hopper 20 includes a slanted forward wall 22 and upright side walls 24 around the front and sides of a suitably large opening 28 formed in the top forward portion of the body 18.

A vehicle body of this general type is often provided with a packer or compaction apparatus 30 for compressing material within the body 18 as it is dumped from the container 10. The compaction apparatus 30 includes a packer or compaction head 32 generally of the same dimensions as the cross-sectional dimensions of the inside of the body 18. The compaction head is guided for movement back and forth toward the front and toward the rear of the vehicle by guides along the inside of the body. The compaction head 32 is moved in reciprocating fashion by a telescoping cylinder device 34 actuated by hydraulic pressure.

When a container 10 is in position above the opening 28 for dumping material into the body 18, the compaction head 32 is moved to its extreme forward position at the front of the body 18, shown in FIGS. 6 and 7, so that material falls into the body between the head 32 and the rear of the body. Thereafter, the cylinder 34 may be actuated as necessary to push the material from the front of the body 18 behind the head 32 toward the rear of the body. Continuous dumping of material into the body 18 and continuous actuating of the head 32 toward the rear of the body compresses the material and thereby increases the capacity of the body.

The body 18 may be provided with a rear door 40, hinged to the body 18 at the top thereof. Normally, the door 40 is latched closed. When it is desired to empty the contents from the body 18, the door 40 may be unlatched and the contents emptied from the body under the assistance of the compaction apparatus 30 by actuating the head 32 towards the rear of the vehicle to push the contents from the body.

The hoisting apparatus 11 includes a pair of lifting arms 44 spaced apart a distance corresponding substantially with the width of the cab 16. The lifting arms 44 may

be of gooseneck shape, or inverted U-shape, for example, so as to extend over the top and downwardly in front and back of the cab 16 as illustrated in full lines in FIG. 1.

At the back of the cab 16 the lower end of the lifting arms 44 are fixed on a horizontal rear torque tube or rod 46 which extends substantially from one side of the vehicle 12 to the other. The torque tube 46 is journaled in bearing boxes which are fixed on the vehicle chassis 14. The lifting arms 44 in this manner are pivotally mounted to the vehicle 12 through the rear torque tube 46 and the bearing boxes.

A pair of lever arms 48 are attached to opposite ends of the torque tube 46 and extend downwardly therefrom. Suitable power devices 50, for example conventional hydraulically actuated cylinder and piston assemblies, are pivotally mounted on the vehicle chassis at 52 and have the piston rods thereof pivotally connected at 54 to the free end of corresponding lever arms 48.

At the front of the vehicle 12 the lifting arms 44 are connected by a horizontal front torque tube or rod 56 which is journaled in bearing boxes 58 secured to the forward ends of the lifting arms 44. On each outside end of the torque tube 56 there is fixed a lever arm 60. A power device 62, for example a conventional hydraulically actuated cylinder and piston assembly, is mounted on each of the lifting arms 44 and pivotally connected thereto at 64. Each power device 62 extends along its corresponding lifting arm 44 and the piston rod thereof is pivotally connected at 66 with an adjacent lever arm 60. A pair of fork arms 70 are rigidly mounted on the torque tube 56 adjacent each lifting arm 44. The fork arms 70 extend forwardly of the vehicle 12 when the lifting apparatus 11 is in the position illustrated in full lines in FIG. 1.

A sleeve assembly 72 is mounted on each end wall of the container 10 and forms a longitudinally extending channel through which a fork arm 70 of the hoisting apparatus 11 may be inserted. A detachable connection between the hoisting apparatus 11 and the container 10 may be established by sliding the fork arms 70 along the end walls of the container 10 and through corresponding sleeve assemblies 72.

In the operation of the hoisting apparatus 11 when emptying the contents of the container 10 into the body 18, the vehicle 12 is driven into position adjacent the container 10, and the fork arms 70 are inserted through the sleeve assemblies 72. Entrance of the fork arms 70 through the sleeve assemblies 72 is effected by proper actuation of the power devices 50 and 62. Continued operation of the power devices 50 causes the lifting arms 44 to swing upwardly. This in turn causes the fork arms 70 to move upwardly, swinging the container 10 over the cab 16 and into dumping position above the hopper 20, illustrated in broken lines in FIG. 1.

After the container 10 has started its upward movement under control of the power devices 50, the power devices 62 can be actuated simultaneously to move the fork arms 70 in a counterclockwise direction with reference to FIG. 1, to keep the container 10 in a substantially upright position during its upward swinging movement. Once the container 10 is above the hopper 20, the power devices 62 can be actuated to swing the fork arms 70 in a clockwise direction to invert the container 10 to dump the contents into the hopper 20 and through the opening 28 into the body 18.

After the contents of the container 10 have been emptied through the opening 28 and into the body 18, the power devices 62 may be actuated to swing the fork arms 70 in a counterclockwise direction to return the container 10 to a generally upright position. Then, the power devices 50 may be actuated to swing the lifting arms 44 downwardly to return the container 10 to a position on the ground in front of the vehicle 12. After the container is on the ground, the vehicle 12 is backed away from the container as necessary to extract the fork arms

70 from the sleeve assemblies 72. As material is dumped into the body 18, the compaction apparatus 30 may be actuated as necessary to compress the material within the body.

The opening 28 is provided with a generally flat cover 80 (FIGS. 2-4) having a longitudinally extending center reinforcing rib 82, a laterally extending reinforcing rib 84 and suitable cross braces 86. The front edge 87 of the cover 80 is tapered to fit with the sloping front wall 22 of the hopper 20 when the cover 80 is in its closed position over the opening 28 (FIG. 4). Also, the side portions of the cover 80 fit snugly with the side walls 24 of the hopper 20. Extending laterally of the vehicle, adjacent the rear edge of the opening 28, there is a ramp-shaped member 88. The bottom of the rear edge of the cover 80 is shaped to fit with the ramp portion 88 when the cover 80 is in its closed position over the opening 28, as shown in FIG. 4.

A pair of front tracks 92 extend longitudinally of the vehicle along the sides of the hopper 20 from the front of the opening 28 for a short distance rearwardly of the opening. The front tracks 92 are supported at the top of the hopper 20 by the side walls 24. The tracks 92 are angled slightly with respect to the top of the body 18 so that the front of the tracks 92 are slightly lower than the rear of the tracks.

A pair of rear tracks 94 extend longitudinally of the vehicle from the rear of the opening 28 towards the rear of the body 18. Each of the tracks 94 includes a relatively short forward portion 96 and a relatively long rear portion 98 which are joined together at an elbow 99 so that the portions 96 and 98 form an angle with respect to each other. The portion 96 is adjacent the rear of the opening 28 and extends upwardly toward the elbow 99 at a comparatively sharp angle. The portion 98 extends rearwardly from the elbow 99 at a relatively gradual angle with respect to the top of the body 18. The front tracks 92 and the rear tracks 94 may be of channel shape opening towards the center of the body 18.

A pair of rectangular-shaped supporting members or blocks 102 at the front and opposite sides of the cover 80 fit into the front tracks 92 and are slidable therein longitudinally of the vehicle. The blocks 102 are fixed to the cover 80 by means of vertically extending plates 104 which may be welded or otherwise fixed to the cover 80. The blocks 102 are fastened to the plates 104 by nut and bolt assemblies or other suitable means. The front of the cover 80 is supported by the front tracks 92 through the blocks 102 and the plates 104. Rollers could be used instead of blocks 102, however, the use of rectangular-shaped blocks serves to keep the inner part of the front tracks 92 cleaned of material or debris which may find its way therein. The extreme forward portion of the front tracks 92 are open and as the blocks 102 move toward the front of the vehicle, the debris is pushed out of the channels.

A pair of rollers 108 fit into and are guided for movement therealong within the rear tracks 94. The rollers 108 are mounted for rotational movement on opposite sides of the rear of the cover 80. It is desirable to use rollers at the rear of the cover 80 because of the sharp incline of the front portion 96 of the rear track 94. The rear of the cover 80 is supported by the rear track 94 through the rollers 108.

A power device 112, for example a conventional hydraulically actuated cylinder and piston assembly, is provided for moving the cover 80 to its open and closed positions. The cylinder 114 of the power device 112 is mounted longitudinally of the body 18 by a bracket 116 which extends laterally of the body 18 from side to side and which is supported above the top surface of the body by vertically extending posts 118 located at the sides of the body. A pair of plates 120 extend downwardly from the bracket 116 and receive therebetween the cylinder 114. The cylinder is mounted on the plates

120 for pivotal movement by means of transversely extending trunnions 122.

The piston or piston rod 126 of the power device 112 extends forwardly from the cylinder 114, and the free end thereof is connected to the forward portion of the cover 80 by means of a pair of plates 128 which are fixed on and extend upwardly from the rib 82 of the cover 80. A pin 130 pivotally connects the free end of the piston rod 126 with the plates 128.

The length of the power device 112 should be proportioned so that one stroke of the piston rod 126 may move the cover 80 from its extreme forward position (FIGS. 2 and 4) to its extreme rearward position (FIG. 3). In the type of apparatus described, the opening 28 is located at the front of the body 18. It is possible, of course, that the opening 28, in other types of apparatus, might be located at the rear of the body 18. In the example illustrated and described, the forward position of the cover 80 is its closed position and the rear position of the cover 80 is its open position.

The cover 80, when in its closed position, fits tightly with the structures surrounding the opening 28. The lower surface of the cover 80 is flush with the top inside surface of the body 18. This presents a continuous flat surface inside the top of the body. The purpose of this is to prevent material from falling over the compaction head 32 as the head is moved toward the rear of the body 18 to compress the material therein. Normally, during the actuation of the compaction apparatus 30, the cover 80 will be in its closed position.

The power device 112 is actuated to move the cover 80 from its closed position to its open position by pulling the cover generally in a horizontal direction rearwardly and immediately above the top surface of the body 18. The cover 80 moves in a sliding or gliding fashion. As soon as the power device 112 begins to pull the cover 80 rearwardly, the rollers 108 begin to move upwardly in the front portions 96 of the rear tracks 94. This moves the rear of the cover 80 rapidly upwardly and out of the opening 28. At the same time, the blocks 102 begin to slide upwardly at a gradual angle in the front tracks 92.

The rollers 108 rolling in the front part 96 of the rear tracks 94 and the blocks 102 sliding in the tracks 92 cooperate to lift the cover 80 over the ramp 88, out of the opening 28 and towards the rear of the body 18. As soon as the rollers 108 reach the elbow 99 in the rear tracks 94, they begin to move downwardly at a gradual angle. This in turn moves the rear portion of the cover 80 downwardly. This downward movement of the rear of the cover 80 after the rollers reach the elbow 99, limits the vertical distance above the top portion of the body 18 in which the cover 80 moves. At the same time, however, the rear portion of the cover 80 is moved suitably high enough above the top of the body 18 to clear the ramp 88 and the ribs 19 along the top of the body 18.

As the rear of the cover 80 moves downwardly, because of the slope of the track portion 98, the front of the cover 80 continues to move upwardly at a gradual angle. This keeps the front of the cover 80 clear of the ramp 88 and the ribs 19, and as the rear of the cover 80 moves downwardly, the piston rod 126 is free of obstruction with the rear of the cover 80 and there will be no binding or contact between the cover 80 and the piston rod 126. The cylinder 114 is free to pivot about the trunnions 122 in order to accommodate the sliding and tilting movements of the cover 80. The area beneath the power device 112 is free of obstruction because of the suspended support for the cylinder 114 provided by the bracket 116 and posts 118. Accordingly, the cover 80 is free to move beneath the power device 112.

The power device 112 can be actuated to move the cover 80 from its open position to its closed position in a reverse manner. As the piston rod 126 pushes the

cover 80 forwardly, the front part of the cover gradually descends toward the front of the opening 28. The rear of the cover gradually ascends as the rollers 108 roll upwardly in the track portion 98 toward the elbow 99. After the rollers 108 reach the elbow, the rear of the cover 80 suddenly drops into the opening 28 and the front of the cover 80 falls into snug contact with the front plate 22 of the hopper 20.

In FIGS. 5-7 there is illustrated a modified form of track arrangement. Except for the tracks, the remaining structure illustrated therein is identical to the structure described previously.

A pair of front tracks 134 extend longitudinally of the vehicle along opposite sides of the opening 28 inside the side hopper walls 24. The front ends of the tracks 134 are adjacent the lower edge of the front wall 22 of the hopper 20 and generally at the same level as the opening 28. The tracks 134 extend rearwardly and upwardly beyond the hopper side walls 24.

A pair of rear tracks 136 include an inclined front portion 138 and a generally horizontally extending longer rear portion 140. The inclined front portions 138 are immediately adjacent the rear of the opening 28 and extend upwardly and are joined at an elbow 141 with the rear portions 140 which extend for a considerable distance toward the rear of the body 18.

Blocks 102 fit into and slide along the front tracks 134 and support the front of the cover 80 on the tracks 134. Rollers 108 fit into the rear tracks 136 and roll therealong and support the rear of the cover 80 on the tracks 136.

When the power device 112 is actuated to pull the cover 80 rearwardly to its open position, the front of the cover 80 begins to slide upwardly out of the opening 28. The rear portion of the cover 80 immediately begins an abrupt upward movement out of the opening 28 as the rollers 108 follow the shape of the front track portion 138. As the power device 112 continues to pull the cover rearwardly, the rollers 108 reach the elbow 141 in the rear track 136 and then begin to move generally horizontally along the rear track portion 140. At the same time, the front portion of the cover 80 continues to move upwardly at a gradual angle. The abrupt upward movement of the rear part of the cover 80 lifts the cover above the ramp 88 and above the ribs 19 in the top of the body 18. Once the cover is above these obstructions, the movement of the rear part of the cover is generally horizontal.

The cover 80 is kept in a generally inclined position, with the front part of the cover slightly higher than the rear part. This prevents a binding or entanglement between the piston rod 126 and the cover. The trunnions 122 which pivotally connect the cylinder 114 to the plates 120 allow freedom of movement of the power device 112 in a vertical plane as does the pin 128 at the free end of the piston rod 126. Only a minimum amount of clearance is required above the top of the body 18 because of the generally horizontal movement of the cover 80 between open and closed positions.

The manner in which the cover 80 fits flush with the inside top surface of the body 18 is shown in FIG. 5. The packer head 32 moves back and forth within the body 18 and the top portion thereof is adjacent the cover 80 when the cover is closed and when the packer head pushes the material past the opening 28 toward the rear of the body 18. In conventional equipment there would normally be a large gap between the lower surface of the cover and the top of the packer head.

Mechanism other than the cylinder device 112 may be employed for moving the cover 80 to its open and closed positions. For example, an endless chain 150 may be extended longitudinally of the vehicle rearwardly of the hopper 20 as shown in FIGS. 8 and 9. The rear part of the chain 150 extends over and is supported by a sprocket 152 pivotally supported between a pair of plates

154 which extend downwardly from a generally horizontally extending brace 156 which extends transversely of the body 18. A pair of posts 158 support the brace 156 a short distance above the top surface of the body 18.

The front part of the chain 150 extends around and is supported by a sprocket 160 fixed on a shaft 161. A pair of plates 162 depend from a horizontally extending brace 163 which is supported a short distance above the top of the body 18 by posts 164 at the sides of the body. The posts 164 may extend upwardly from and be supported by the rear end portions of the tracks 134. The shaft 161 extends to one side of the body 18 and is mounted on and supported for rotation by the plates 162 and one of the posts 164. A sheave 166 is fixed on the outside end of the shaft 161 and an endless hand chain 168 extends over the sheave and hangs downwardly along the side of the body 18 where it may be grasped and pulled to rotate the sheave 166 and the shaft 162 in either rotational direction.

A rigid link 170 has one end thereof fastened at 171 to the chain 150 and extends downwardly and is connected to the rearward edge of the cover 80 by means of a pin 173 extending between a pair of small plates 174 fixed on the rear edge of the cover 80.

When the hand chain 168 is pulled to rotate the sprocket 160, and in turn, the chain 150 in one rotational direction, the cover 80 is moved rearwardly from its closed position to its open position. The chain 150 pulls the link 170 which in turn pulls the cover 80. Similarly, the sprocket 160 and the chain 150 may be rotated by the hand chain 168 in the opposite rotational direction to push the link 170 forwardly and in turn push the cover 80 to its closed position. The blocks 102 slide in the front tracks 134 to support and guide the front portion of the cover 80, and the rollers 108 roll in the rear tracks 136 to support and guide the rear of the cover 80 in the manner described above. In FIG. 9, the cover 80 is shown in both its open and closed positions.

A hydraulically actuated power device 180 for propelling the chain 150 is illustrated in FIGS. 10 and 11. The power device 180 may replace the hand chain 168, or may be used on the same body 18 along with the hand chain. The power device 180 includes a hydraulic motor 182 which may be supplied with fluid under pressure through either a line 184 or a line 186 to cause the hydraulic motor 182 to rotate in either rotational direction. The flow of fluid through the lines 184 and 186 may be controlled by the operator while he is located within the cab 16.

A shaft 188 connects the hydraulic motor 182 to a speed reducer 190, and an output shaft 192 of the speed reducer 190 is equipped with a suitable sprocket 194. An endless type chain 196 extends around the sprocket 194 on the output shaft 192 and around a sprocket 198 fixed on a shaft 200 supported for rotation by a pair of plates 202. A sprocket 204 similar to the sprocket 152 is mounted on the shaft 200 and supports the chain 150. The plates 202 are suspended from a horizontal brace 206 which extends transversely of the body 18. A pair of vertical posts 207 support the brace 206 a short distance above the top of the body.

Rotation of the hydraulic motor 182 under control of the operator will cause the sprocket 204 to rotate in either rotational direction to pull or push the chain 150 and the link 170 in either direction longitudinally of the vehicle. The link 170 in turn pulls the cover 80 from its open position to its closed position or pushes the cover 80 from its open to its closed position.

When either one of the hydraulically actuated power devices 112 or 180 is employed for moving the cover 80, the opening and closing of the cover may be controlled automatically without the attention of the operator. It is necessary, of course, that the cover 80 be open when the container 10 is moved into position above the hopper 20 for dumping the material through the opening 28 into

the body 18. At all other times, it is desirable generally that the cover 80 be closed. Opening and closing of the cover 80 may be effected in response to movement of the lifting arms 44.

In this connection, the flow of hydraulic fluid to the cylinder 114 of the power device 112 may be controlled automatically by suitable valve devices, and similarly, the control of the fluid through the lines 184 and 186 to the hydraulic motor 182 may be controlled automatically. For this purpose, a valve 210 (FIG. 1) located adjacent the rear torque tube 46 may be employed together with a valve 212 (FIG. 3) located on the top and rear part of the body 18. Reference may be made to companion application of William A. Herpich, Neil F. Wender, and Glenmore G. Garrett, Serial No. 115,177, filed June 6, 1961, for an explanation of a system which may be used to control the opening and closing of the cover 80 automatically.

The cover 80 has the advantage of being suitably large for covering a necessary large opening 28 at the top of the body 18. Yet, the cover 80 has considerably low clearance. At the same time, the cover 80 fits flush with the inside top surface of the body and is received snugly by the cooperating structure on the body 18.

Even though the cover 80 fits within the opening 28, movement of the cover to its open and closed positions is accomplished in a simple manner by apparatus which does not obstruct the opening and which is not ordinarily affected by an accumulation of material gathering on the top of the body 18 around the opening 28. The special tracks cooperate to raise the cover out of its flush engagement with the body 18 without hindering the operation of the mechanism which propels the cover 80.

While the invention has been illustrated and described in various embodiments, it is recognized that other variations and changes may be made therein without departing from the invention as set forth in the claims.

I claim:

1. In combination, a body provided with an elongated packing chamber having an inner ceiling surface and having a packer device operating lengthwise of the chamber along said inner ceiling surface, said body having an opening in the top thereof; a cover for said opening; means for moving said cover; first track means extending along opposite sides of the opening for guiding one end of the cover into and away from the opening, one end of said first track means being closer to said opening than the other end; and second track means aligned with said first track means and extending away from the opening for guiding the opposite end of the cover into and away from the opening, said second track means having a portion adjacent said other end of said first track means which extends at a sharp angle away from said body and joins at an elbow with another portion which extends at a gradual angle toward the body.

2. In combination, a body provided with an elongated packing chamber having an inner ceiling surface and having a packer device operating lengthwise of the chamber along said inner ceiling surface, said body having an opening in the top thereof; a cover for said opening; means for moving said cover; first track means extending along opposite sides of the opening for guiding one end of the cover into and away from the opening, one end of said first track means being closer to said opening than the other end; and second track means aligned with said first track means and extending away from the opening for guiding the opposite end of the cover into and away from the opening, said second track means having a portion adjacent said other end of said first track means which extends at a sharp angle away from said body and joins

at an elbow with another portion which extends generally parallel with the top of the body.

3. In a motor vehicle having a body provided with an opening in the ceiling surface thereof to receive material, said body having a packer head operating in the body along said inner ceiling surface, the combination of a cover for the opening, tracks extending along opposite sides of the opening, guide means mounted on the tracks and connected with one end of the cover for supporting said end of the cover, separate tracks extending away from the opening adjacent the opposite end of the cover, guide means mounted on the separate tracks and connected with the opposite end of the cover for supporting the last mentioned end of the cover, said last-mentioned tracks having short oblique sections at the ends thereof toward the opening extending downwardly toward the opening for guiding the edge portions of the cover supported thereon into the opening and with the inner surface of the cover substantially flush with the ceiling surface of the body.

4. In a vehicle having a refuse body provided with an elongated packing chamber having an inner ceiling surface and having a packer device operating lengthwise of the chamber along said inner ceiling surface, said body having an opening in the top thereof through said inner ceiling surface, the combination therewith, of a cover for the opening, means mounting the cover for movement lengthwise of the body and externally thereof to a position over the opening, said mounting means including first tracks extending along opposite sides of the opening from a point adjacent the opening to a point further from the opening for guiding one end portion of the cover substantially to and away from the opening, second tracks extending lengthwise of the first tracks and extending rearwardly and upwardly away from the opening for guiding the opposite end of the cover substantially to and away from the opening, said tracks moving the cover into the opening when in registry therewith with the inner surface of the cover forming a continuation of the ceiling surface of the chamber for uniform movement of the packer device therealong when the cover is in place.

5. The combination of claim 4, including power means for moving the cover to open and closed positions relative to the opening.

6. The combination of claim 4, including a fluid power cylinder device mounted on the body and operatively connected with the cover for moving the cover to open and closed positions relative to the opening.

7. The combination of claim 4, including an endless chain assembly mounted on the body and operatively connected with the cover for moving the cover to open and closed positions relative to the opening.

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