

April 2, 1963

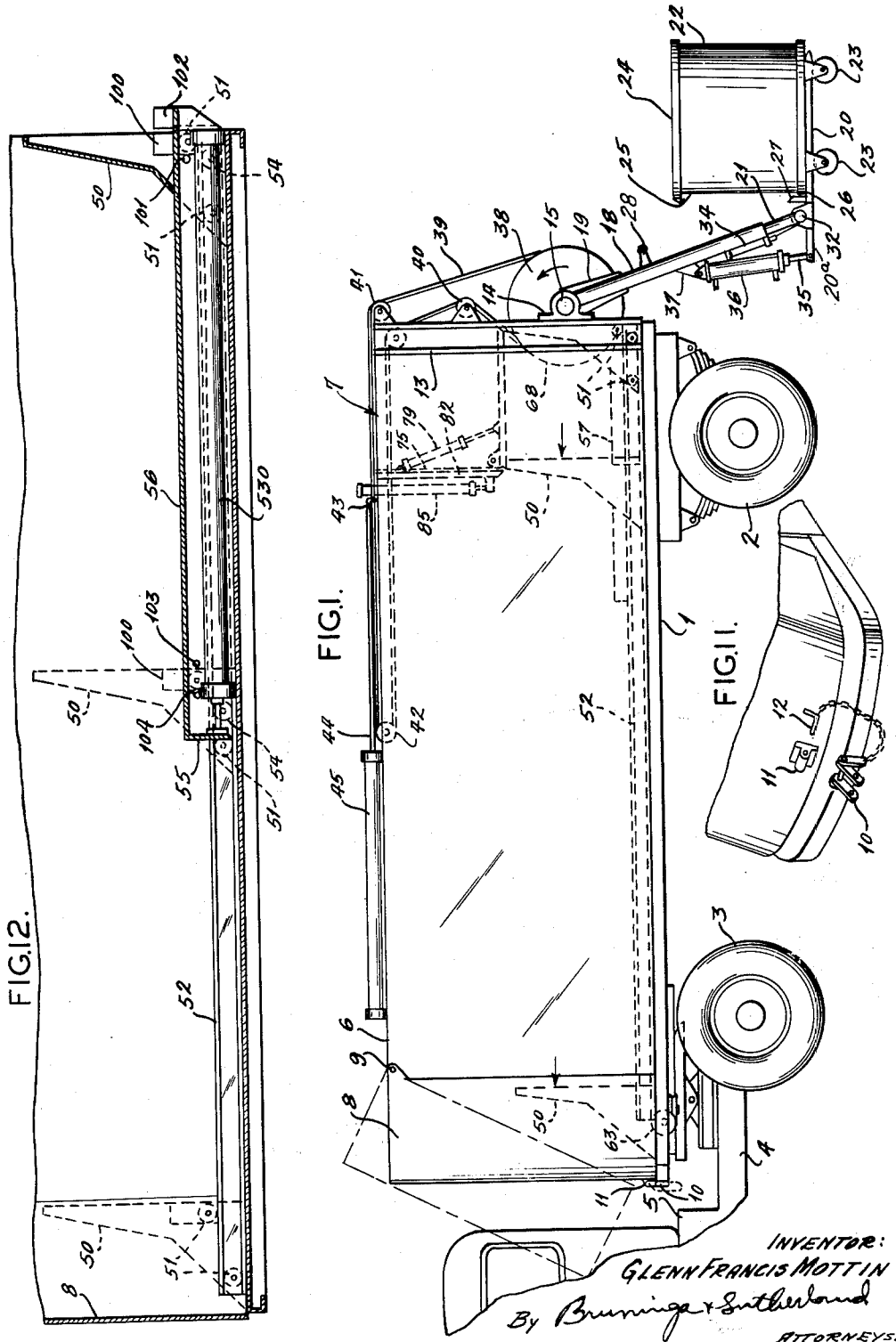
G. F. MOTTIN

3,083,849

APPARATUS FOR COLLECTING MATERIALS

Filed March 4, 1957

5 Sheets-Sheet 1



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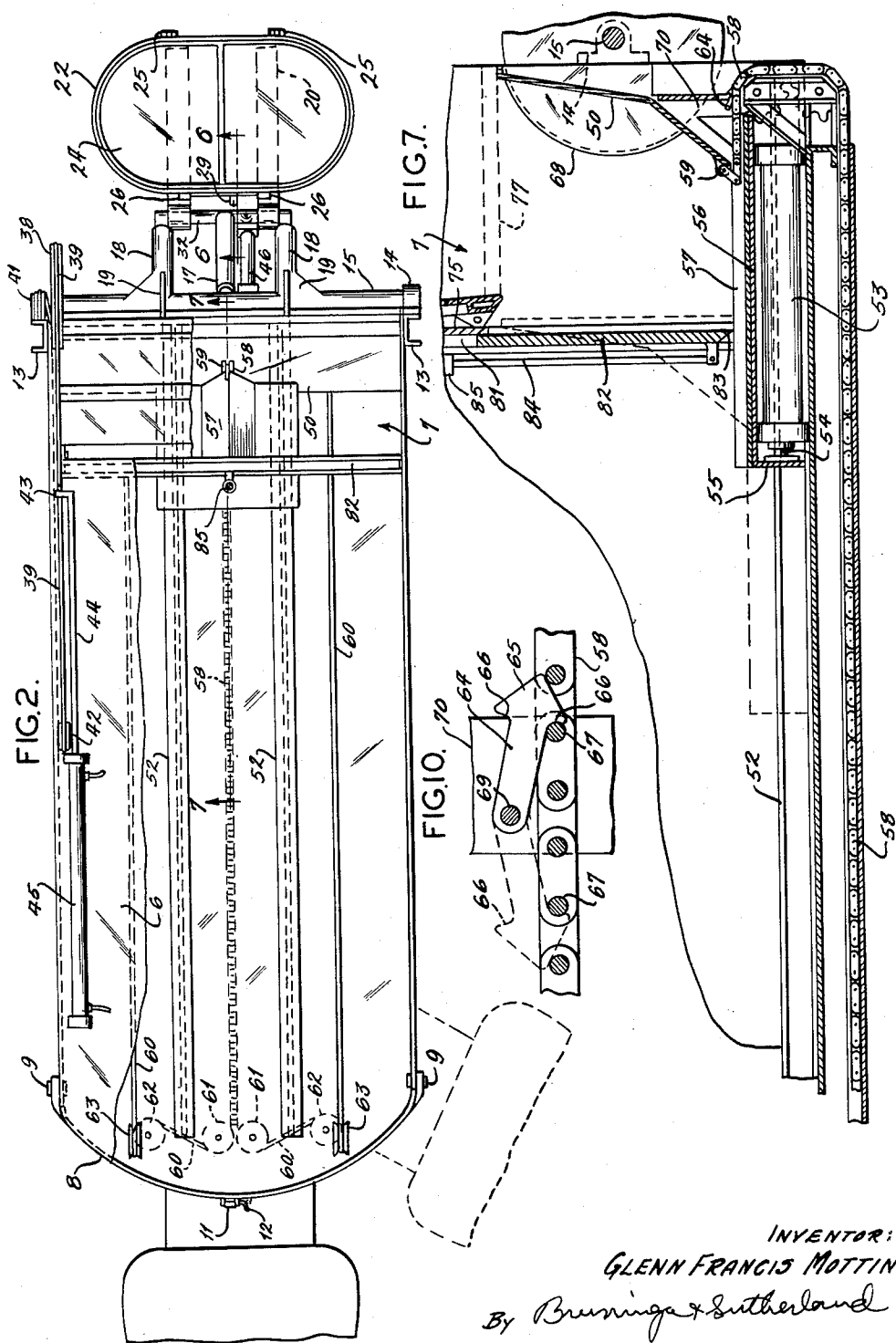
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APPARATUS FOR COLLECTING MATERIALS

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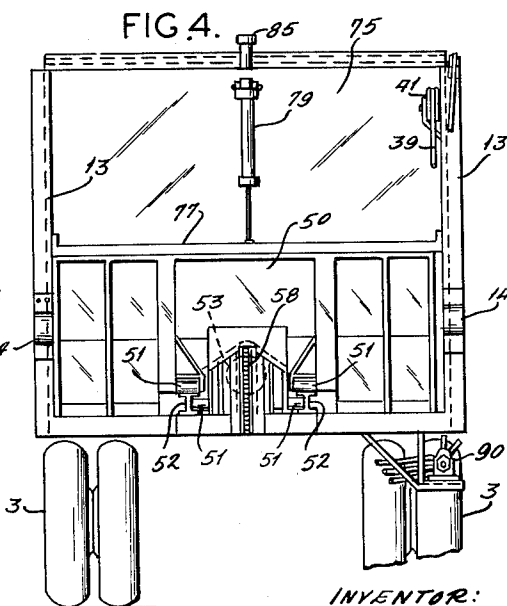
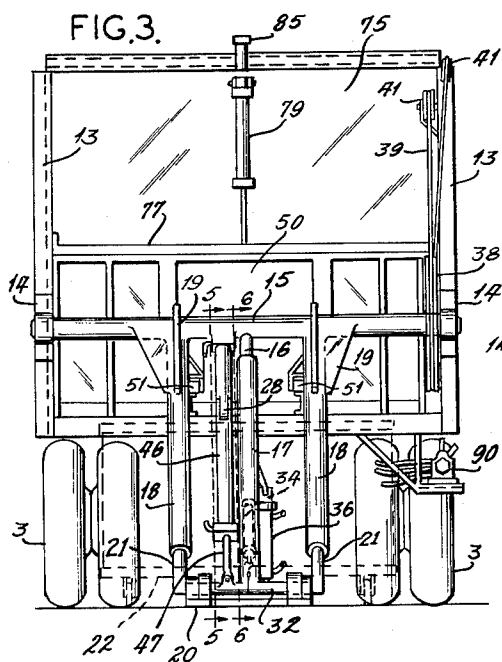
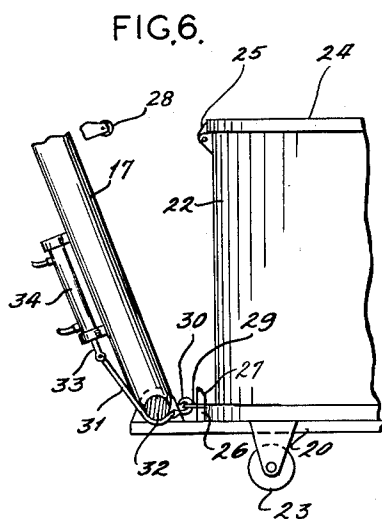
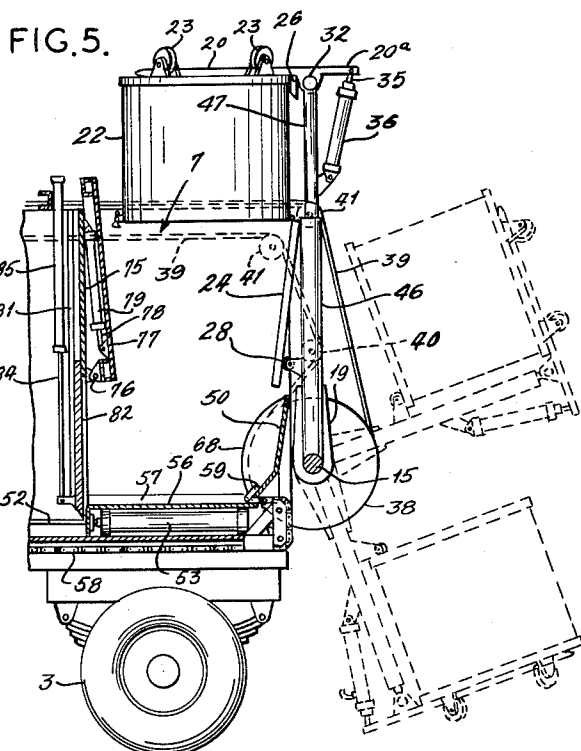


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APPARATUS FOR COLLECTING MATERIALS

5 Sheets-Sheet 3



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FIG. 8.

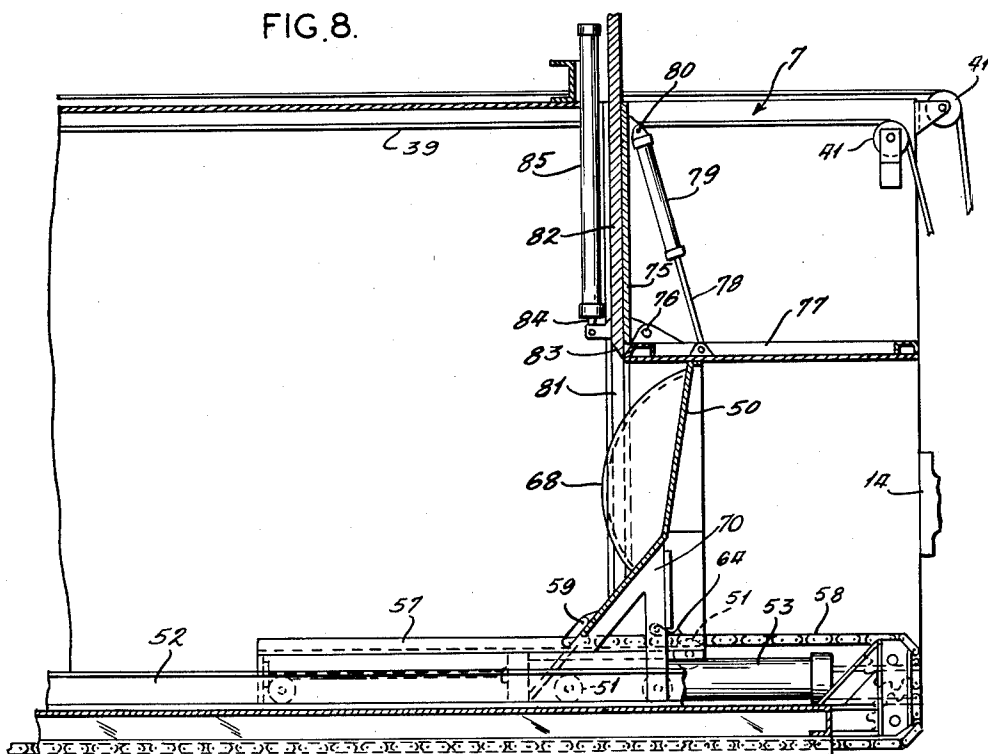
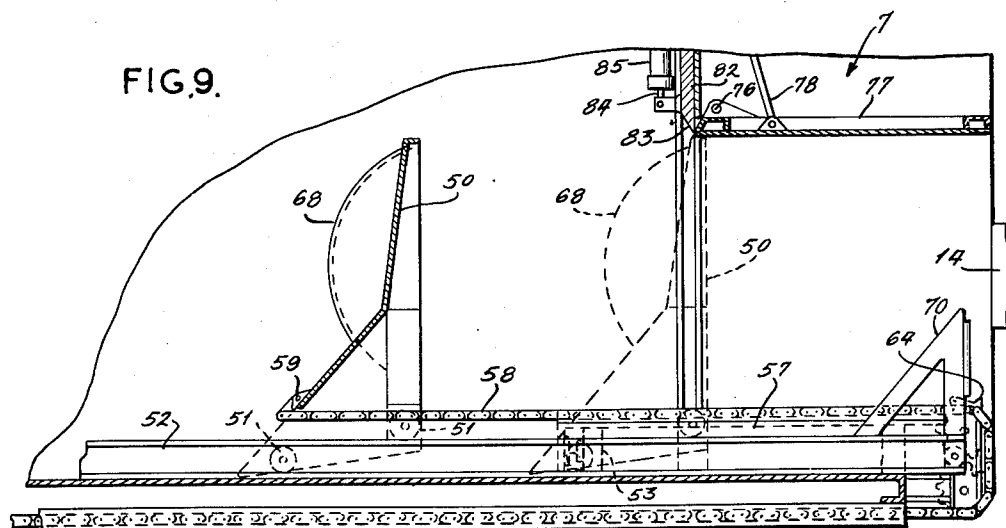


FIG.9.



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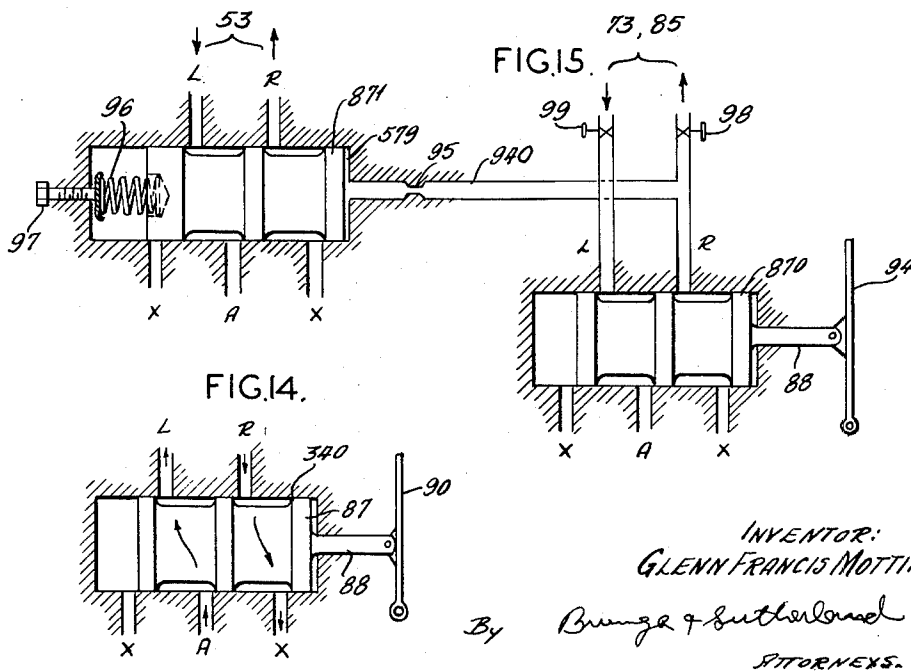
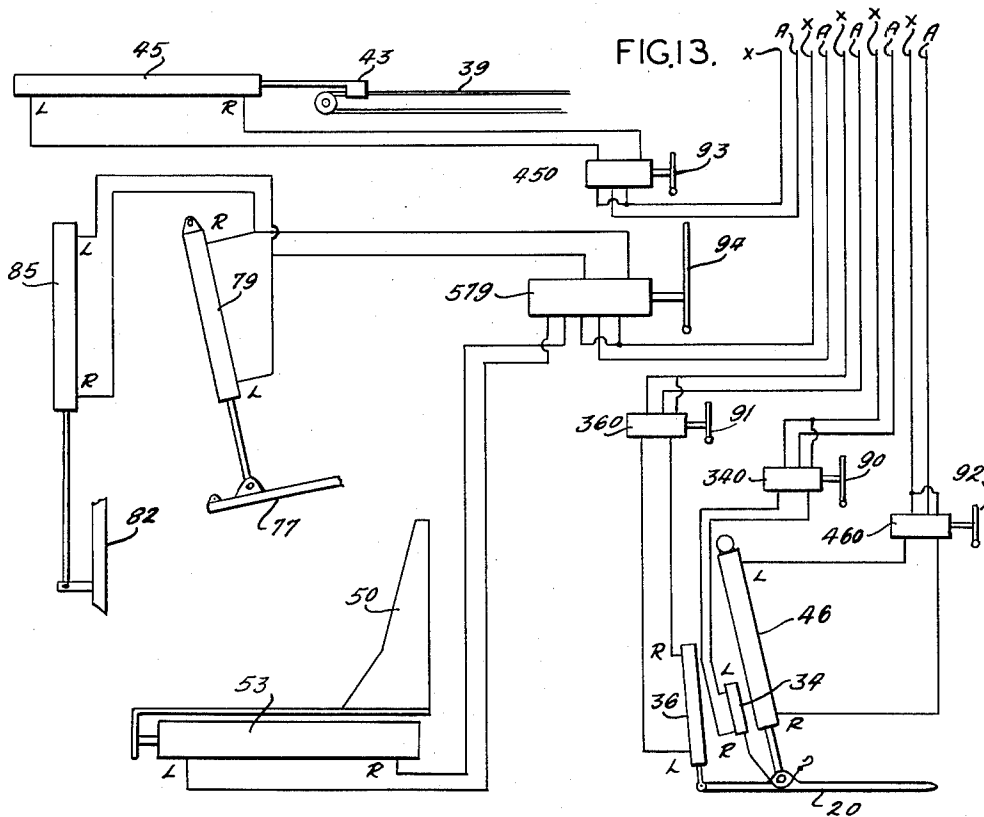
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APPARATUS FOR COLLECTING MATERIALS

5 Sheets-Sheet 5



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3,083,849

APPARATUS FOR COLLECTING MATERIALS
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 Filed Mar. 4, 1957, Ser. No. 643,594
 10 Claims. (Cl. 214-302)

This invention relates to an apparatus for collecting materials. In the embodiment disclosed, the apparatus is one for collecting waste materials which accumulate in factories, homes, etc., examples being paper, cartons, boxes, etc.

One of the objects of this invention is to provide an apparatus of the character described by which the collection of the materials is facilitated.

Another object is to provide an apparatus in which such materials can be expeditiously collected, but can be temporarily stored in a body such as a trailer or truck body and compacted therein, and which body can then be moved to a suitable location and the materials discharged.

Further objects will appear from the detailed description illustrating a number of embodiments of this invention; it is to be understood, however, that this invention is susceptible of various embodiments within the scope of the appended claims.

In the drawings: FIG. 1, Sheet 1, is a side elevation of an apparatus embodying this invention;

FIG. 2, Sheet 2, is a plan partly cut away;

FIG. 3, Sheet 3, is an end elevation of the loading end of the machine;

FIG. 4, Sheet 3, is a view similar to FIG. 3, but with the elevating mechanism omitted;

FIG. 5, Sheet 3, is a side elevation similar to FIG. 1, but partly in section on the line 5-5, FIG. 3, and showing the elevating mechanism in different positions;

FIG. 6, Sheet 3, is a detailed side elevation partly in section on lines 6-6, FIGS. 2 and 3, parts 20a and 36 being omitted but showing the position of part 23, and showing the container and its attachment to the elevating mechanism;

FIG. 7, Sheet 2, is a detailed section on the line 7-7, FIG. 2, showing the packer, the stripper and the valve with the packer in loading position;

FIG. 8, Sheet 4, is a view similar to FIG. 7, but showing the stripper 82 elevated, the valve 77 down and showing the packer in partially extended forward position;

FIG. 9, Sheet 4, is a view similar to FIG. 8, but showing the packer in further extended forward position;

FIG. 10, Sheet 2, is a detail showing the connection of the packer to the operating mechanism;

FIG. 11, Sheet 1, is a detail showing a lock for the front of the body;

FIG. 12, Sheet 1, is a sectional view showing another embodiment of this invention;

FIG. 13, Sheet 5, is a diagram showing various hydraulic or pneumatic means for operating the various parts;

FIG. 14 is a detail of a spool valve; and

FIG. 15 is a detail of another spool valve.

An apparatus as disclosed in the illustrative embodiment comprises generally, although not specifically, the following: A material-receiving body is in the form of a trailer body pulled by a tractor, although it may be the truck body itself. This body has an upper entrance for the material at the loading end of the body and has an outlet at the other end provided with a closure. A material-receiving container has a closure, together with means for mounting the container for movement from a lowered receiving position to an elevated discharging position over the entrance, and means is provided for so moving the container, adapted to automatically open the clo-

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sure and discharge the material from the container when the container reaches such elevated position. A packer is mounted at the bottom of the body and is movable from below the entrance, forwardly to the other end of the body. A stripper in the form of a wall extends downwardly from the top of the body, forwardly of the entrance and to nearly the top of the travel of the packer, and this stripper is arranged to strip the material from the packer as it recedes rearwardly beyond the stripper. A valve is positioned above the packer and this valve is movable alternately clear of the entrance to permit the material to be discharged in front of the packer and across the entrance to nearly the top of the packer. The stripper, valve and packer are operated in cooperative relation. The packer is moved forward and back, being movable forward to the wall or stripper, and back for another charge. After the body has been loaded to capacity, the packer is moved forward after the front cover has been opened, and is then returned to the loading end of the body. During this movement to discharge the material, the packer is moved forward in successive stages. Suitable mechanism, which may be either hydraulic or pneumatic, is provided for moving the various parts and these are subject to control by the operator.

Referring now to FIGS. 1, 2 and 11, a body 1, which in this case is in the form of a trailer body, is mounted on wheels 2 and 3, the front axle is connected by a drawbar 4 to a suitable tractor generally shown at 5. The top of the body is closed as shown at 6 to the rear loading end where an opening is left to provide an entrance at 7 for the material. The front of the body is provided with a closure 8 which is pivoted at 9 and which is secured by a hasp 10 on the body taking over a perforated lug 11 on the closure, the hasp and lug being perforated to receive a pin 12.

Referring now to FIGS. 1, 2 and 3-6, mounted on up-rights 13 of channel section are bearing brackets 14 in which are mounted a shaft 15 carrying tubular extensions 18 additionally braced by brackets 19 to which the extensions 18 are fixed, the whole being fixed to the shaft 15 to move therewith. The shaft 15 has a plunger 16 moving in a tubular extension 17 mounted on a cross shaft 32 to which is attached the bottoms of the plungers 21 sliding in the tubular extensions 18, 18.

A support 20 is pivoted to the shaft 32. The support 20 is arranged to receive a container 22 having wheels 23, so that it may be moved to the right away from and towards the body 1, and the support takes between the wheels so as to support the bottom of the container as shown in FIGS. 1 and 6. This container has a closure 24 pivoted at 25. The support 20 has lugs 26 spaced crosswise thereof and beveled at the top as shown at 27. A cylinder 46 is fixed to shaft 15 and has fluid connections, FIG. 13. The cylinder has a plunger 47 attached to the shaft 32, FIG. 3. The cylinder 46 has a lug 28 arranged to be engaged by the top of the closure 24 of the container 22 so as to hold the top closure 24 closed.

The container has a bail 29, FIG. 6, which is arranged to receive an open hook 30 connected to a cable 31 passing underneath the shaft 32 between the support 20 and the plungers 21. This cable is connected to the rod 33 of a piston (not shown) working in a cylinder 34 mounted on the middle tubular extension 17 shown dotted, FIG. 3, full FIG. 1, and provided with inlet and outlet fluid connections as shown in FIG. 13. A lug 20a on the left end of the support 20, FIG. 1, is pivotally connected with a rod 35 not shown in FIG. 6, and having a piston (not shown) working in the cylinder 36, provided with inlet and outlet fluid connections, FIG. 13, and pivoted to a lug 37, FIG. 1, also on the middle tubular extension 17, FIG. 3.

Referring particularly to FIGS. 1, 3 and 5, the shaft

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15 has fixed thereon a sheave 38 provided with a V-groove of the type usually employed in rope gearing and around which passes an endless cable 39 passing over idlers 40, 41 and 42, FIG. 1. The cable has a clamp 43, FIG. 1, connected with the rod 44 of a piston (not shown) traveling in a cylinder 45 on the top of the body and having fluid connections as shown. Referring to FIG. 3, a cylinder 46 mounted on the shaft 15 and provided with inlet and outlet fluid connections FIG. 13, has a piston (not shown) connected to a rod 47, in turn connected with the shaft 32.

The operation of the parts thus shown is briefly as follows, a more complete résumé of operations being given after a description of the controls illustrated in FIG. 13: With the support 20 in lowered receiving position as shown in FIGS. 1 and 6, and which may be a few inches above the ground, this support is arranged to receive the container 22. This container can be taken off of the support and moved around to receive the material, the top closure 24 being, of course, at this time opened. With the container filled, the top is closed and the container is moved over onto the support 20 which, as previously described, passes between the rolls or wheels 23. The hook 30 is now attached to the bail 29 and the cylinder 34 is energized, pulling the container 22 to the left, FIG. 6, against the lugs 26. The cylinder 36, FIG. 1, is now energized to swing the container counterclockwise on shaft 32 against the carrier, i.e. extensions 17, 18 and cylinder 46, with the top 24 of the container under the lug 28 on the cylinder 46 so as to hold the top closure down on the container 22, see dotted portions, FIG. 5. The cylinder 45, FIG. 1, is now energized operating through piston rod 44 and cable 39 connected to sheave 38 on the shaft 15, causing the support 20 and its container to move from lower position to its upper position over the top entrance 7 opening in the body, in the manner shown from FIGS. 1 to 5. During the latter part of that movement the cylinder 46, FIG. 3, will be energized to move the plunger rod 47 upwardly, the rods 21 rising in the tubular extensions 18 and the extension 17 rising on the plunger 16, so as to raise the support 20 and the container thereon, which latter at this time is inverted, FIG. 5. The lug 28 which is on the cylinder 46 will not rise with the container, so that the closure 24 will move vertically away from the lug and will now drop against the lug as shown in full lines, FIG. 5, while the container is in inverted position, so as to discharge its contents through the top opening 7 of the body. At that time, however, the container is held against downward movement on the support 20 at the right FIG. 5, by the bail 29 attached to the hook 30 on the cable 31 passing underneath the shaft 32 and holding the container against the lug 26, see FIG. 6, while the container 22 is still held against tipping on the support 20 because the upper end of the closure, FIG. 5, bears against the top of 46 while the end of the closure bears against the lug 28 on 46. During the upward movement of the inverted container 22 by the plunger 47 in the cylinder 46, the upward movement of the plunger 47 in the cylinder 46 will impart rapid upward movement of the inverted container 22 so as to effect rapid downward discharge of the material in the container.

Referring now to FIGS. 1, 2 and 7-11, sliding on the bottom of the body is a packer 50, this packer having rolls 51 moving in guides 52 along the bottom of the body. Mounted at the loading end of the body is a cylinder 53 provided with inlet and outlet fluid connections FIG. 13, and having a piston (not shown) whose rod 54 is connected to the front 55 of a slide 56 to which is connected a bunter 70 behind the packer 50. Above the slide 56 is a stationary channel 57 in which slides a link chain 58 connected at its right end to the packer as shown at 59. The chain 58 is connected with a pair of cables 60 passing over idlers 61, 62 and 63 FIG. 2, and also connected with the packer. A pawl 64 pivoted at 69 on the bunter 70 has a head 65 shaped as shown in FIG. 10 to form

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hooks 66 taking over pins 67 between the links of the chain 58, and movable to full and dotted positions shown. The pawl 64 in dotted position holds the packer against the bunter 70 in the position shown in FIG. 7. The packer has a side wing 68 which, in the full position FIG. 7, forms a guard for the pulley or wheel 38. Upon energizing of the cylinder 53, and with the pawl 64 in dotted position, FIG. 10, and as shown in FIG. 7, the packer 50 will be moved from the solid to dotted positions FIG. 7, but this operation will be more fully described later.

Referring to FIGS. 1, 5, 7, 8 and 9, mounted at the forward end of the top entrance 7 is a stationary wall 75 which has pivoted thereon at 76 a valve 77 connected by a rod 78 to a piston (not shown) in a cylinder 79, provided with inlet and outlet fluid connections FIG. 13, and pivoted at 80 on the wall. Upon energizing of the cylinder 79, the valve 77 is moved to the positions shown in FIGS. 1, 5, 7, 8 and 9.

Referring again to FIGS. 1, 5, 7, 8 and 9, the stationary wall 75 terminates above the travel of the top of the packer 50 and guides 81 on the sides of the body are provided for a movable wall or stripper 82 which moves up and down in the guides and which, when down, forms a continuation of the stationary wall 75. The lower end of this stripper is beveled as shown at 83 and is connected by a rod 84 to a piston (not shown) in a cylinder 85 provided with inlet and outlet connections FIG. 13. Upon energizing of the cylinder 85, the piston is moved up and down to move the stripper up and down as shown.

As shown in FIGS. 5 and 7, material is discharged into the space between the packer 50 and the movable wall or stripper 82, while the valve 77 is positioned vertically against the guides 81. Thereafter the valve 77 moves down to horizontal position, as shown in dotted position FIG. 7, so as to compact the material downwardly. Thereafter the stripper 82 is raised as shown in FIGS. 8 and 9, while the valve 77 is still in horizontal position, and the packer 50 moves to the left to move the compacted material into the body. The cycle is then repeated.

The mechanism as above described may be operated in any suitable manner; however, FIG. 13 is a diagram showing means for controlling the various cylinders hydraulically or pneumatically. For this purpose a suitable pump, which may be a rotary or gear pump (not shown), is mounted upon the tractor and is operated from the tractor motor or engine. Suitable controls are mounted on the end of the body, one of such controls being diagrammatically shown in FIGS. 3 and 4 at 90. Pressure and return fluid connections from the fluid pressure pump on the engine extend to the various controls and from these controls in turn extend connections to the various cylinders hereinafter described.

FIG. 13 shows in diagrammatical form a series of controls to the various cylinders, also diagrammatically shown, and these cylinders are indicated by the same reference numerals as in the other figures; and, for convenience, the control valve for any given cylinder is indicated by the same reference numeral with "0" added, except that for the joint control of cylinders 53, 79 and 85, the control valve is indicated at 579, and the control levers are shown at 90, 91, 92, 93 and 94. Furthermore, for convenience the ends of the cylinders are given the reference numerals L and R which are also applied to the connections to the controls at L and R. The supply of fluid under pressure to the control valves is indicated at A and the returns are indicated at X, in FIGS. 13, 14 and 15. The control valves may be of any suitable construction, but for illustrative purposes these control valves are in the form of casings provided with spool valves of well-known construction.

In the illustrated embodiment, all of the cylinders, except 53, 79 and 85, are each provided with a control valve as illustrated in FIG. 14 which, for illustrative purposes, is applied to the cylinder 34. A casing 340 has movable therein a spool valve 87 provided with annular recesses as shown and provided as usual with packing rings

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(not shown) between the recesses. This spool valve is connected by a stem 88 with an operating handle 90 whereby the valve may be shifted. The ports to this casing are indicated at L, R, A, X and X. In the normal position of the spool valve as shown in FIG. 14, the L and R ports are connected to the L and R ends of the cylinder 34, with L connected to the pressure side A of the fluid and with the R port connected to the return X of the fluid, so that the piston in 34 will be in down position. Upon shifting of the valve 87 to the left, FIG. 14, the port R will be connected to the pressure side A of the fluid and the port L to the return side X of the fluid, so that the piston in the cylinder 34 will be moved up to pull the container 24 onto the support 20 as previously described.

Spool valves like those shown in FIG. 14 and provided with operating handles designated 91, 92 and 93, are connected to supply the other cylinders 36, 46 and 45 respectively so as to energize those cylinders in the same manner as described in connection with the cylinder 34.

The cylinders 53, 79 and 85 are controlled by a sequence valve 579, FIG. 13, with an operating handle 94, and 579 may be in one piece, but, for convenience, is shown diagrammatically as separated in FIG. 15. The right part of the valve is like that shown in FIG. 14, so that the parts are similarly designated, the spool valve being indicated at 870. In this case the L and R ports extend to the cylinders 85 and 79, so that upon operation of the spool valve in a like manner as described for FIG. 14, both of those cylinders will be energized to shift the parts 82 and 77. It will be noted that the R and L connections to 85 and 79 are in reverse relation so that when fluid is supplied thereto the stripper 82 will be down while valve 77 will be up and vice versa, as will be seen from FIGS. 1, 5, 7 and 8. The R port, however, has an extension 940 which is throttled at 95 and extends to the right of a casing 579, FIG. 15, which is provided with a spool valve 871 like that of valve 87. This spool valve, however, is normally held in right position by a spring 96 which may be set at any suitable tension by a screw 97. The ports L and R extend to the L and R ports of the cylinder 53 for the packer 50. The purpose of this construction is to secure a delayed movement of the piston in the cylinder 53.

With the controls in the position shown in FIGS. 13 and 15, the packer 50, the valve 77, and the stripper 82 will be in the position shown in FIGS. 5 and 7, that is, with the packer 50 retracted to the right at the loading end, the valve 77 up, and with the stripper 82 down. At this time the material will be loaded from the container by operation of handles 90, 91 and 92 and will fall between 50 and 82, FIG. 5. As soon as the container has been moved from elevating to lowered position, by shifting lever 92 the control 94 can be operated to shift the right spool valve 870, FIG. 14, to the left. That will immediately apply the full force of the fluid to cylinders 79 and 85 so as to move the valve 77 down to preliminarily pack the material in front of the packer. Thereafter the stripper 82 will be raised out of the path of the packer as shown in FIGS. 1, 8 and 9. The fluid pressure will not be applied to the left valve 871, FIG. 15, supplying cylinder 53 for the packer 50, until the pressure has risen sufficiently in the connection 940 to overcome the tension of the spring 96, which fluid pressure is throttled by the reduced opening 95. This will give a delayed period for the operation of the packer, sufficient to permit the valve 77 to drop and to raise the stripper 82 out of the path of the packer 50, FIGS. 1, 8 and 9. The left valve 871, FIG. 15, is then shifted automatically so as to cause pressure to be applied to the cylinder 53 so as to move the packer to the left, FIGS. 1 and 8, underneath and to the left of the wall 75 and the raised stripper 82. Upon now reversing the movement of the spool valve 870 by the handle 94 so as to move it to the right, FIG. 15, so as to operate the packer 50, the stripper 82 and the valve 77 in the reverse way than before. In order to

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ensure that the packer 50 will return to its right loading position FIG. 1 while the stripper 82 is still up, a hand valve 98 may be opened, thereby relieving the pressure on the right end of valve 871, FIG. 15, so as to cause its spring to shift the valve to the right and supply fluid to the left end L of cylinder 53, FIGS. 1 and 14, and return the packer, and valve 99 may then be closed. Handle 94, FIG. 15, may now be operated to shift the valve 870 to supply fluid to the L ends of cylinders 85 and 79, FIG. 14, in order to move stripper 82 down and valve 77 up as in full lines FIGS. 5 and 7 to again receive the material. Hand valve 99 may also be provided to control the operation of valve 870 FIG. 15.

A résumé of the operation is as follows, referring particularly to FIGS. 13, 14 and 15 in connection with FIGS. 1, 5, 7, 8 and 9. The container 22 is taken to a place where it can be loaded, and when loaded, the top closure 24 is closed and the container rolled over the support 20. The hook 30 is then attached to the bail 29. The operator then actuates the controls in the following order: Operation of control 90 pulls the container onto the support 20 and against the stop 26. Control 91 is then operated to bring the container against extensions 17 and 18, with the top closure against the lug 28 so as to hold the top closure 24 closed. Control 93 is then operated to swing the container upwardly about the shaft 15 and then in inverted condition over the opening 7. Control 92 is then operated to further rapidly raise the inverted container and to cause the top closure 24 to be released from the lug 28 and to drop so as to rapidly discharge the material in front of the packer 50 and in back of the stripper 82 which is now down. Control 92 is then moved back so as to drop the container and then control 93 is operated to swing the tubular extensions 17 and 18 and with them the container back to the position as shown in the lowest dotted position, FIG. 5. During such movements of the part, FIG. 5 full lines, through the dotted positions, the lug 28 will again engage the top closure 24 to hold it on the container. Control 91, FIG. 13, is now operated to swing the support 20 and its container 22 about the pivot 32 from the lower dotted position, FIG. 5, to full positions, FIGS. 1 and 6, causing the top of the container to move free of the lug 28 and to release the top closure 24. Control 90 is now operated to permit release of the bail 29 from the hook 30 thereby allowing the container to be moved free of the support 20 for refilling. The operator will now, or while controls 92, 93, 91 and 90 are operated, actuate control 94 so as to first move the valve 77 down to preliminarily pack the loose material in front of the packer while the stripper 82 is raised. After a delayed action due to the restriction 95, the packer 50 moves forwardly to push the material through the opening below the wall 75 and into the body. The valve 98 is then moved back so as to cause the packer 50 to move back to loading position, after which the handle 94, FIG. 14, is moved to move the stripper down while the valve 77 moves up, as shown in FIGS. 5 and 7. This operation is successively repeated so as to successively load material in front of the packer and to successively load the material into the body until the body has been filled. By the operation of control 94 the packer 50 and the valve 77 and the stripper 82 are moved in synchronism but without interference. There is no liability of the material falling back into the space below the stripper because the stripper is moved down in back of the material.

After the body has been filled, the contents of the body are ejected in the following manner: The cover or closure 8 is unlatched and moved up. The packer is then moved forwardly in successive steps. In order to accomplish this and render the operation of the valve and stripper inactive, manually operated valves 98 and 99 are provided as shown in FIG. 15, so that upon operation of the control 94, and after the stripper 82 is raised, there will be no supply of fluid to the cylinders 79 and 85, but only

to the valve 871 and the cylinder 53 of the packer. The packer is now moved forward by operation of the control 94 at which time, as just noted, the valve and stripper remain inactive. With the packer in forward position, the pawl 64 is moved from dotted position, FIG. 10, to full position. Upon return movement of the control 94 and as the slide 56 returns, carrying the bunter 70 with it, the pawl will slide over the pins 67 of the chain 58, leaving the packer in the position shown in dotted lines, FIG. 7. Upon again operating the control 94, the packer 50 is moved forward an additional step; this step is repeated until the packer moves to the extreme forward end of the body as shown in dotted lines at the left, FIG. 1, so as to push the compacted material out of the body. This material will have been compacted sufficiently from top to bottom so that none of the material will slough over the top of the packer.

In order to now return the packer to its loading position, the pawl 64 is moved from full to dotted position, FIG. 10. Upon operation of the control 94, at which time the valve 99 is closed so as to keep the stripper 82 up and the valve 77 down, the packer is shifted back to loading position in successive stages until it finally arrives at the position at the loading end of the body and with the packer against the bunter 70.

FIG. 12 shows another embodiment of this invention. Here the parts have been given the same reference numerals as in the other figures, except that the cylinder numbered 530 is longer. The slide 56 is in this case provided with a bunter 102 which is arranged to take against a lug 100 on the packer 50 and a removable pin 101 passing through the sides of the slide engages the left end of the lug 100. When the parts are as shown at the right, and with the valves 98 and 99 closed, energizing of the cylinder 530 will move the packer forward from full to intermediate dotted position. The pin 101 is then removed so that upon reversal of the piston in the cylinder 530, the packer 50 will be left in the intermediate position. The pins 103 and 104 are now placed on opposite sides of the lug 100 as shown in the middle of the figure. Upon again energizing of the cylinder 530, the packer will now be moved to another position shown at the extreme left of FIG. 12. There may be a number of successive stages of movement of the packer, depending upon the length of the cylinder 530. In the final position, when the packer is at the right end of the body and the cover 8 having been opened, the packed material will be pushed out. In order to return the packer, the movement from the left to the middle position by reversal of the piston in the cylinder is accomplished without taking out the pins 103 and 104; thereupon the pins 103 and 104 are removed upon then again moving the piston to the left until the bunter 102 engages the lug 100; then the pin 101 is replaced so that upon moving the piston to the right the packer will be brought back to the position at the right.

It will therefore be seen that this invention accomplishes its objects. An apparatus is provided by which the collection of materials is facilitated, in which the material can be temporarily stored in a body such as a trailer or truck body and compacted therein, and which can then be moved to a suitable location and the materials discharged.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. An apparatus of the character described, comprising, a material-receiving body whose front end is connected for traction and whose rear end is closed, said body having an upper entrance at the rear end thereof for receiving the material, a packer mounted at the bottom of said body and movable from below said entrance forwardly against the material below said upper entrance towards the front end of said body, a valve positioned above said packer, and means for moving said valve to a vertical position above and to clear said entrance.

2. An apparatus of the character described, comprising, a material-receiving body whose front end is connected for traction and whose rear end is closed, said body having an upper entrance at the rear end thereof for receiving the material, a packer mounted at the bottom of said body and movable from below said entrance forwardly against the material below said upper entrance towards the front end of said body, a valve positioned below said entrance and above said packer, and means for moving said valve to a vertical position above and to clear said entrance and to a horizontal position across said entrance.

3. An apparatus of the character described, comprising, a material-receiving body whose front end is connected for traction and whose rear end is closed, said body having an upper entrance at the rear end thereof, a packer mounted at the bottom of said body and movable from below said entrance forwardly towards the front end of said body and back, a movable wall positioned forwardly of said entrance and movable into and out of the path of said packer, a valve positioned above said packer and movable across and clear of said entrance, and means operatively connected with said wall and said valve operating automatically to move said valve clear of said entrance to permit entrance of the material in front of said packer when back and to thereafter move said valve across said entrance and operating automatically to move said wall out of the path of said packer as it moves forwardly and in front of said packer as it returns and reaches said entrance.

4. An apparatus of the character described, comprising, a material-receiving body having at the top thereof a material-receiving entrance, a carrier pivoted on said body to swing from a lower downwardly directed position to an elevated upwardly directed position, a container support mounted for sliding movement along said carrier, a material container mounted on said support with its outlet up when said carrier and said support are in lower position, means for swinging said carrier from such lower position to such elevated position so as to place said container in inverted position and with its outlet down and over said entrance, and means on said carrier additional to said means for swinging said carrier and operating at the termination of the upward swinging of said carrier adapted to impart to said support and its inverted container a rapid movement vertically upwardly along said carrier to effect rapid downward discharge of the material in said container.

5. An apparatus of the character described, comprising, a material-receiving body having at the rear thereof a top entrance for receiving the material, a packer mounted at the bottom of said body below said top entrance and movable from the rear end of said body forwardly and thereafter rearwardly, a valve supported below said entrance but above said packer and mounted for movement alternately to a vertical position laterally of said entrance and thereafter downwardly to a horizontal position across said entrance, means operating while said packer is positioned rearwardly adapted to move said valve downwardly to pack the material forwardly of said packer, and means operating thereafter to move said packer forwardly to move the packed material into said body.

6. An apparatus of the character described, comprising, a material-receiving body having at the rear thereof a top entrance for receiving the material, a packer mounted at the bottom of said body below said top entrance and movable from the rear end of said body forwardly and thereafter rearwardly, a valve supported below said entrance but above said packer and mounted for movement alternately to a vertical position laterally of said entrance and thereafter downwardly to a horizontal position across said entrance, means operating while said packer is positioned rearwardly adapted to move said valve to a vertical position to clear said entrance and

operating thereafter to move said valve downwardly to pack the material forwardly of said packer, and means operating thereafter to move said packer forwardly to move the packed material into said body.

7. An apparatus of the character described, comprising, a material-receiving body having at the rear thereof a top entrance for receiving the material, a packer mounted at the bottom of said body below said top entrance and movable from the rear end of said body forwardly and thereafter rearwardly, a wall positioned forwardly of said entrance and movable vertically into and out of the path of said packer, a valve supported below said entrance but above said packer and mounted for movement alternately to a vertical position laterally of said entrance and thereafter downwardly to a horizontal position across said entrance, means for moving said wall down and for moving said valve to a vertical position to clear said entrance, all while said packer is positioned rearwardly, said valve operating means thereafter moving said valve downwardly to pack the material between said wall and said packer, and means operating thereafter to move said packer forwardly after said wall operating means has moved said wall upwardly out of the path of said packer in order to permit said packer to move the packed material into said body.

8. An apparatus of the character described, comprising, a material-receiving body having at the rear thereof a top entrance for receiving the material, a material-receiving container having a movable top closure, a carrier movable from a lower receiving position to an elevated discharging position, means for mounting said container on said carrier to move therewith from an upright lower material receiving position to an inverted elevated material discharging position over said entrance and vice versa, means for so moving said carrier and said container, holding means on said carrier, means for moving said container along said carrier towards and away from said holding means, adapted on the elevating movement of said carrier to cause said holding means to engage the edge of and hold said closure down on said container until said container is in its discharging position, said holding means being adapted upon movement of said container away from said holding means to release said closure to permit it to open and discharge the material from said container when said container reaches said elevated inverted position, said holding means being adapted upon movement of said container towards said holding means to reengage said closure with said holding means while the carrier moves back to lower receiving position, said holding means being again released from said closure upon movement of said container away from said holding means when said carrier reaches lowered material receiving position.

9. An apparatus of the character described, comprising, a material-receiving body having at the rear thereof a top material-receiving entrance, a carrier pivoted on

said body to swing from a lower downwardly directed position to an elevated upwardly directed position, a container support mounted for sliding movement along said carrier, a material container mounted on said support in upright position with its outlet up at the lower position of said carrier and at an inverted position with its outlet down at the upper position of said carrier, a movable top closure on said container, means for swinging said carrier from such lower position to such elevated position, a lug on said carrier adapted to engage said closure when said carrier is moved to elevated position, and means operating upon the termination of such swinging of such carrier adapted to slide said support upwardly along said carrier and with its container inverted over said entrance, adapted to cause said lug to release said closure.

10. An apparatus of the character described, comprising, a material-receiving body having at the top thereof a material-receiving entrance, a material container having a top closure, a carrier pivoted on said body to swing from a lower downwardly directed position to an elevated upwardly directed position, a container support on said carrier, a first power operated means adapted to so swing said carrier, a second power operated means on said carrier and connected to said container adapted to pull and secure the same onto said support, a lug on said carrier, a third power operated means on said carrier adapted to swing said support and said container thereon against said carrier with said container closure under said lug, said first power operated means operating to swing said carrier back to its lower position, said third power operated means operating to swing said container with said container closure away from said lug.

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