

June 2, 1942.

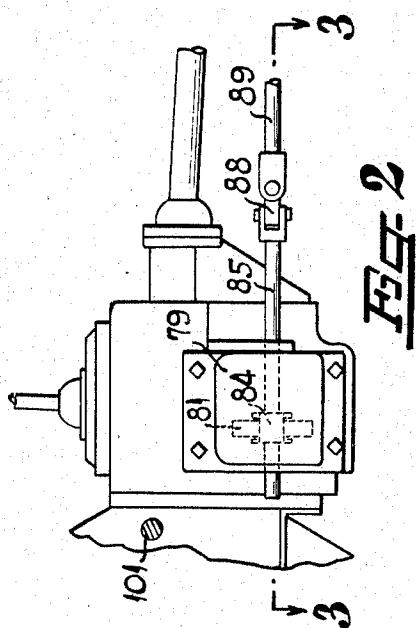
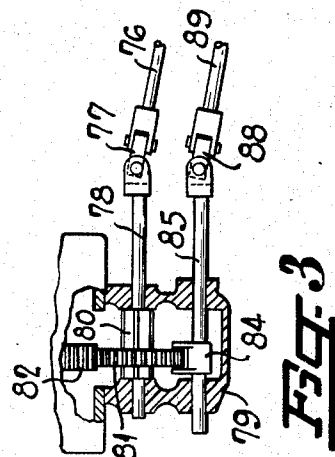
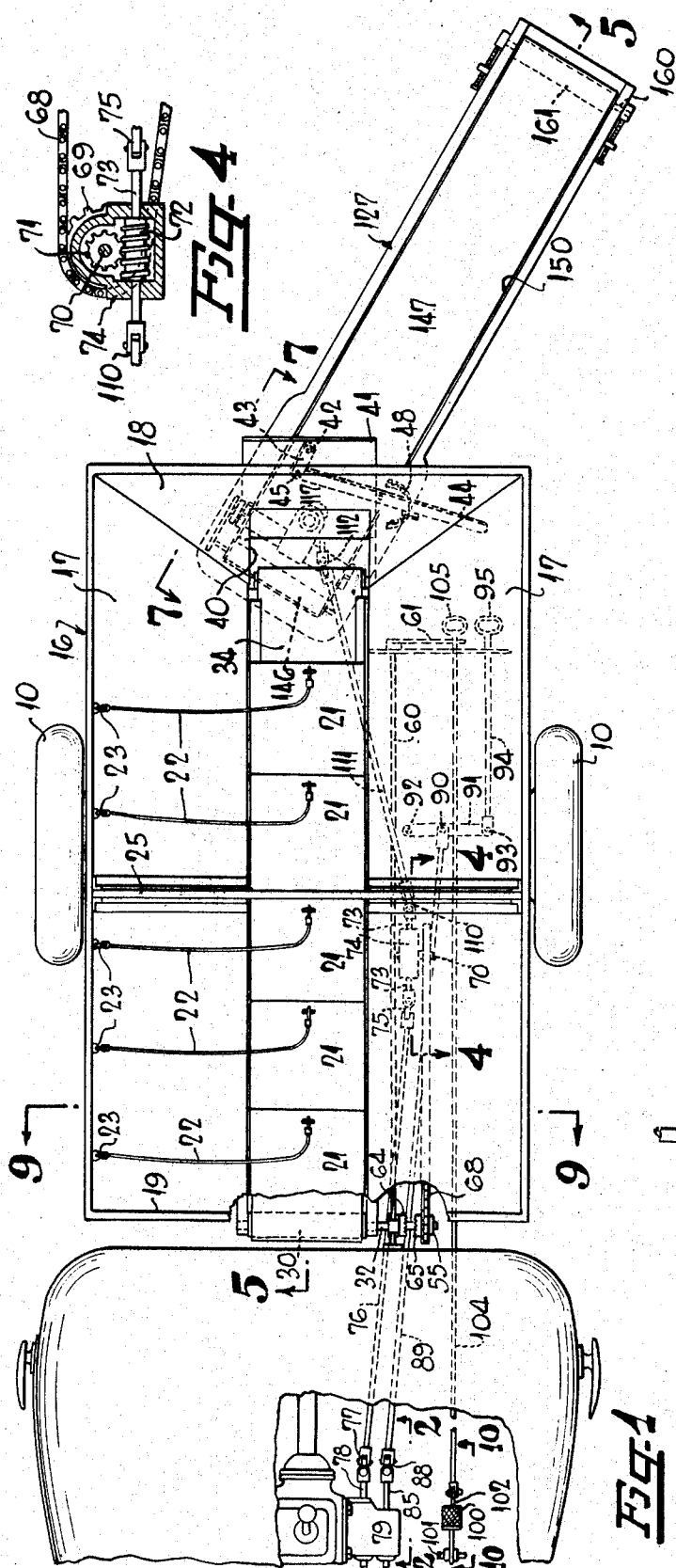
R. E. WALL

2,284,853

UNLOADING MECHANISM FOR TRUCKS

Filed Nov. 1, 1940

3 Sheets-Sheet 1



Inventor:
REUBEN E. WALL
By *Eaton & Brown*
Attorney

June 2, 1942.

R. E. WALL

2,284,853

UNLOADING MECHANISM FOR TRUCKS

Filed Nov. 1, 1940

3 Sheets-Sheet 2

Attorney's

June 2, 1942.

R. E. WALL

2,284,853

UNLOADING MECHANISM FOR TRUCKS

Filed Nov. 1, 1940

3 Sheets-Sheet 3

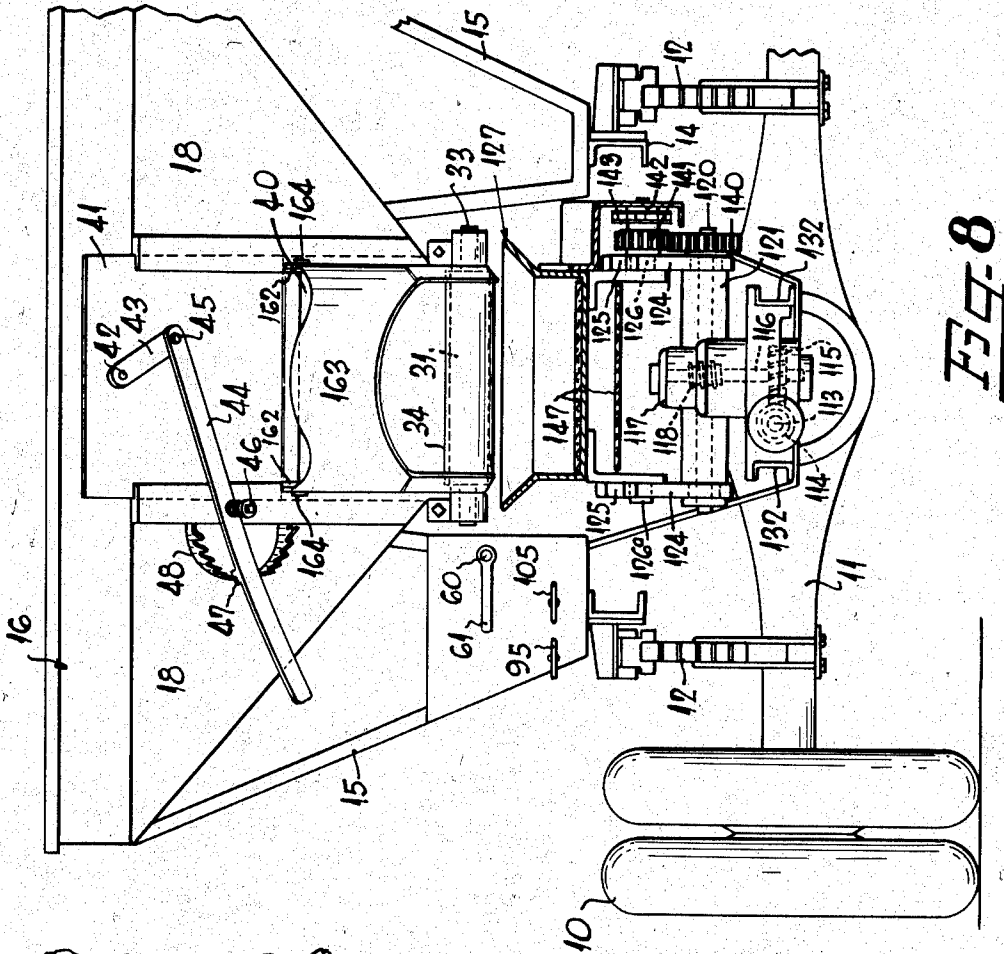


Fig. 8

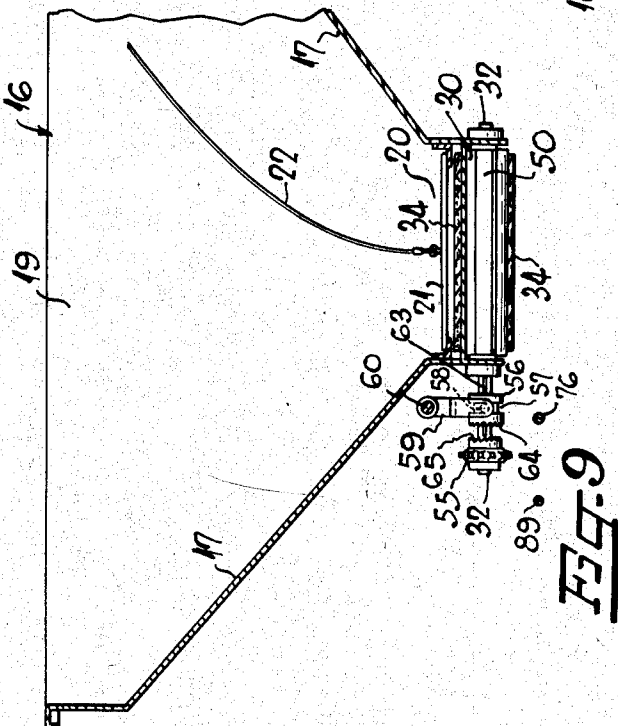


Fig. 9

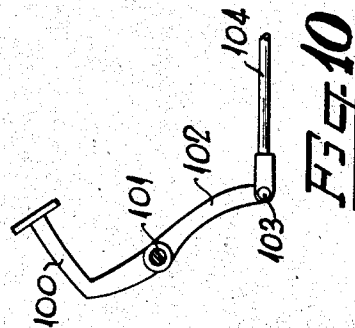


Fig. 10

REUBEN E. WALL
Inventor

By *Eaton & Brown*
Attorney s

UNITED STATES PATENT OFFICE

2,284,853

UNLOADING MECHANISM FOR TRUCKS

Reuben E. Wall, Winston-Salem, N. C.

Application November 1, 1940, Serial No. 363,879

8 Claims. (Cl. 214-83)

This invention relates to a vehicular unloading truck for materials such as coal, crushed stone and the like, and more especially to an improvement over my former patent, No. 2,107,682, of February 8, 1938.

It is an object of this invention to provide a motor truck, the body of which has an inclined rear wall with a gateway therein, said body also having an unloading conveyor belt mounted in its bottom and terminating adjacent the lower edge of the gateway. A second universally mounted conveyor having one end thereof disposed beneath the end of the first conveyor belt and the gateway comprises one of the elements of this invention. Such a construction permits a large percentage of the material in the back of the truck body to be unloaded upon the second conveyor by manipulating the gateway and without placing the first conveyor belt in operation. Means are also provided whereby the second conveyor belt can be operated independently of the first one; therefore, when the material from the rear portion of the truck is falling through the gateway by gravity, the second conveyor can be operated to remove the material to the desired location.

It is another object of this invention to provide an unloading truck of the class described which is adapted to be operated by the power of the take-off unit of the motor and which has the motor controls for operating the conveyor belts located at the rear of the truck body in proximity to the gateway. By having the controls so located, the operator can selectively operate the conveyor belts while watching the flow of material through the gateway; therefore, the delivery of the material to the second conveyor can be controlled so that overloading will not occur.

It is another object of this invention to provide an unloading motor truck of the class described, in which the second universally mounted conveyor has one end thereof cantilevered beneath the delivery end of the first conveyor. The second conveyor is mounted at a point which is about even with the end of the first conveyor; however, one end of the second conveyor extends forwardly of the truck from this point thereby making it possible to cantilever a portion of the second conveyor beneath the first conveyor. In the conventional unloading devices of this type, it is the usual practice to place the universal mounting for the second conveyor substantially at one end thereof, thereby placing the entire second conveyor on one side of the

mounting. By mounting the conveyor intermediate its ends, one end of the conveyor belt can be more completely centered relative to the end of the first conveyor and also relative to the opening in the truck thereabove, so that regardless of the position to which the second conveyor might be turned, the material will fall squarely upon the end of the second conveyor.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings in which—

Figure 1 is a plan view of an unloading truck embodying my invention;

Figure 2 is an elevation taken along the line 2-2 in Figure 1, showing the power take-off mechanism associated with the transmission of the truck motor;

Figure 3 is a sectional view taken along the line 3-3 in Figure 2;

Figure 4 is a sectional view taken along the line 4-4 in Figure 1, showing a gear reduction unit which is employed in the line of drive for the delivery conveyor in the bottom of the truck body;

Figure 5 is an enlarged longitudinal sectional view taken along the line 5-5 in Figure 1;

Figure 6 is a plan view similar to the right-hand central portion of Figure 1, and being taken along the line 6-6 in Figure 5;

Figure 7 is an elevation looking at the reverse side of the right-hand central portion of Figure 5, said view being taken along the line 7-7 in Figure 1;

Figure 8 is a vertical sectional view looking at the rear portion of the truck body, and being taken along the line 8-8 in Figure 5;

Figure 9 is a cross-sectional view taken along the line 9-9 in Figure 1;

Figure 10 is a vertical sectional detail view taken along the line 10-10 in Figure 1, showing the clutch pedal of the automobile and the connecting link thereto which extends to the rear of the truck body.

Referring more particularly to the drawings, the numeral 10 denotes the wheels of a suitable motor truck which are mounted at each end of axles which are disposed in an axle housing 11. The axle housing 11 has mounted thereon conventional springs 12 for supporting the framework 14 (Figure 8) and extending upwardly from the framework are inclined struts 15, the upper ends of which support a hopper 16. This hopper has inclined side walls 17 and an inclined end wall 18; whereas, the front wall 19 is vertically disposed.

The lower portions of the sidewalls converge inwardly into a suitable trough 20, said trough having a bottom comprising a plurality of removable plates 21. Each of the plates has a cable or wire 22 connected thereto and the upper ends of the cables are secured as at 23 to the sidewall 17. In order to form a plurality of compartments within the truck body, a suitable partition 25 is removably inserted between the sidewalls 17. The purpose of this partition is to separate measured quantities of materials so that one portion in one compartment can be delivered at one location and the material in the other compartment can be delivered to another location.

The trough 20 has rollers 30 and 31 disposed in the end thereof, said rollers being mounted upon shafts 32 and 33 respectively. Upon the rollers 30 and 31 a suitable endless conveyor belt 34 is mounted. It will be seen that the material which is adapted to be placed in the compartment thereabove is supported by the removable members 21 to thereby relieve excessive weight and friction upon the top layer of the belt 34.

By observing Figures 5 and 7, it is seen that the rear inclined wall 18 of the truck body has an opening 40 therein disposed directly above the right hand end of the conveyor belt 34. This opening is adapted to be closed by a gate 41 which gate is mounted for sliding movement upon the rear inclined wall 18 of the truck. Pivotaly secured to the plate 41 as at 42 is a link 43 said link having a lever 44 pivoted thereto as at 45. The lever 44 is pivoted intermediate its ends as at 46 to the end wall. This lever has a lateral projection 47 at a point slightly removed from the pivot point 46 which projection engages an arcuate rack 48, also secured to the rear wall 18. When it is desired to vary the size of the opening 40, it is only necessary to rotate the lever 44 to the desired position at which time the projection 47 and the rack 48 will hold the same in position.

In order to insure that material such as coal, dust, dirt and the like will not accumulate upon rollers 30 and 31 suitable scrapers 50 have been located in close proximity thereto. These scrapers serve to remove the material as it collects upon the periphery of the rollers.

The roller shaft 32 (Figures 1 and 9) has rotatably mounted on one end thereof, a sprocket wheel 55. Also mounted upon this shaft is a hub 56 having a peripheral groove 57 therein which is penetrated by pins 58, said pins being disposed in the lower free end of a forked member 59. The forked member has its upper end fixedly secured upon a shaft 60, said shaft 60 extending rearwardly of the truck to a location close to the opening 40. On the end of this shaft (Figure 8) a suitable operating handle 60 is mounted. The member 56 is keyed for longitudinal sliding movement on the shaft 32 by means of a suitable keyway 63. It will be noted that member 56 has a toothed clutch face 64 which is adapted to engage clutch face 65 on the hub of sprocket 55. When it is desired to place the conveyor belt 34 in operation, the lever 61 is rotated in a clockwise manner in Figure 8, thereby causing the clutch faces 64 and 65 to engage each other at which time, the shaft 32 and the roller 30 will be rotated by the pulleys 55.

Mounted upon the sprockets 55 is a chain 68, said chain also being mounted upon a second sprocket 69 (see Figure 4). Sprocket 69 is fixedly secured on a shaft 70 which shaft has a worm gear 71 thereon meshing with a worm 72. The worm 72 is fixed upon a shaft 73 which in turn is

rotatably mounted in housing 74. Connected to the shaft 73 as at 75 is a link 76, the other end of which is connected as at 77 to shaft 78 (see Figures 1 and 3). The shaft 78 extends into power take-off housing 79 and has integral therewith a longitudinally grooved portion 80 within the housing upon which a gear 81 is slidably mounted. This gear is adapted to mesh with the driving gear 82 in the transmission of the truck.

In Figure 3, the gear 81 is shown in mesh with drive gear 82, but it is necessary to provide means for shifting the gear 81 on the grooved portion 80 so that the conveyor belt can be operated or discontinued. A suitable forked member 84 is adapted to straddle the gear 81 which forked member is fixed on a shaft 85. This shaft is likewise slidably mounted in the power take-off housing 79 in parallel relation to the shaft 78 previously described. Connected to the right hand end of the shaft 85 as at 88 is a link 89 which link has its other end pivoted as at 90 to a lever 91, said lever having one end thereof pivoted as at 92 to the framework of the truck. The free end of the lever 91 has pivoted thereto as at 93, a link 94 said link 94 extending to the rear of the truck to a point near the opening 40. A suitable handle portion 95 is formed on the end of link 94 so that the operator can manipulate the gear shifting mechanism.

Before the gear 81 is shifted to engaged or disengaged position, it is necessary to actuate the conventional clutch pedal of the automobile. This mechanism is likewise operable at the rear end of the truck near the opening 40. The clutch pedal 100 (Figures 1 to 10) is pivoted as at 101 in a conventional manner. An extension 102 is provided on the lower portion of the clutch pedal to which is pivoted as at 103, the link 104, said link 104 extending to the rear of the truck and having an oval-shaped portion 105 formed thereon for engagement by the operator's hand.

When the link 104 is pulled to the right in Figure 1, the clutch pedal 100 will be rotated in a counterclockwise manner in Figure 10, after which the members 84, 85, 89, 91, 94 and 95 can be actuated to shift the gear 81 to disengaged or engaged position relative to driving gear 82.

By referring to Figures 1 and 4, it is seen that the shaft 73 also has connected thereto as at 110 a link 111, said link 111 having its other end connected as at 112 (see Figure 6) to a shaft 114. Shaft 113 has a worm 114 mounted thereon meshing with a worm gear 115. This gear 115 is fixedly mounted on vertically disposed shaft 116 in housing 117. Also mounted on vertically disposed shaft 116 is a worm 118, which meshes with a worm gear 119 on horizontally disposed shaft 120. The shaft 120 is rotatably mounted in housing 121 which forms an integral part of housing 117 previously described.

On each end of the housing 121 are suitable supports 124, each of which has an open-ended slot 125 in the upper portion thereof (see Figures 5, 6 and 8) for the reception of hubs 126 and 126a. These hubs support the left-hand end of the second conveyor which is broadly designated by the reference character 127. It should be noted that the housings 117 and 121 can rotate about the vertical shaft 116 as an axis. The pivot hubs 126 and 126a permit rotation of the conveyor 127 about a horizontal axis. Therefore, it is seen that the conveyor is mounted for universal movement upon the housings 117 and 120 using shaft 116 and hubs 126 and 126a as pivots. The housing 117 is supported by a suitable cross

beam or bracket 130 which, in turn, is supported by framework 132.

One end of the shaft 120 has a suitable gear 140 fixedly mounted thereon. This gear is adapted to mesh with another gear 141 (see Figure 8) which gear is rotatably mounted upon the supporting hub 126 previously described, said gear 141 having integral therewith a sprocket 142 upon which a chain 143 is mounted. The chain 143 is also mounted upon another sprocket 144 on shaft 145. This shaft has fixedly mounted thereon a roller 146 upon which a conveyor belt 147 is mounted. The roller 146 and the shaft 145 are rotatably mounted at the left hand end of trough 150.

It is therefore seen that the roller 146 (Figure 5) is disposed a substantial distance to the left of the supporting shaft 126 and to the left of vertical shaft 116. In other words, the conveyor 127 is mounted for universal movement at a point substantially removed from the left hand end thereof which point is disposed beneath the end of the first conveyor 34 and the opening 40, thereby permitting the end of the trough member 150 to be centrally located beneath the opening 40 and beneath the end of the first conveyor 34. If the left-hand end of the trough 150 were not cantilevered a certain amount to the left of the point of mounting (Figure 5), then the end of the trough would not remain centered beneath the opening 140 should the conveyor 127 be turned at a very pronounced horizontal angle to the first conveyor belt 34. Also mounted in the trough 150 at the end remote from the end in which roller 146 is mounted is a second shaft 160, said shaft having fixedly secured thereon a roller 161 upon which the belt 147 is also mounted.

In order to insure that the material which passes through opening 40 will be directed upon the trough 150, a pair of plate members 162 have been provided on opposed sides of the opening. To these plates is pivoted an inverted U-shaped shield or chute 163 as at 164. When the right hand end of the delivery conveyor 127 is raised to a very high elevation, the U-shaped member 163 can be raised to correspond to this position.

The second conveyor 127 is equipped with a roller 166 which serves to tighten the belt 147 (see Figure 6). Also the rollers 146 and 161 are equipped with suitable scraper members 50, previously described, which serve to prevent the accumulation of dirt, coal dust and the like upon these rollers.

It is therefore seen that I have provided an improved truck in which the coal or other material may be delivered to a universally mounted delivery conveyor without a likelihood of spilling or without overloading the delivery conveyor. The overloading of the delivery conveyor is prevented by virtue of having the means for independently driving the same and also by having the controls for the conveyors located in close proximity to the opening through which the coal or material falls from the truck body.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. In combination, a motor driven truck having a bed provided with downwardly converging sidewalls and a downwardly and forwardly converg-

ing rear wall, a trough extending longitudinally of the bed and being disposed below the lower edges of said converging side walls, said rear wall having an opening therein communicating with one end of said trough, a closure member for said opening, a conveyor disposed in said trough, the end of said conveyor terminating approximately at the lower forward end of said opening, a second conveyor having one end thereof universally mounted beneath the rear end of the first conveyor and beneath said opening, and means for driving said conveyors.

2. In combination, a motor driven truck having a bed provided with downwardly converging sidewalls and a downwardly and forwardly converging rear wall, a trough extending longitudinally of the bed and being disposed below the lower edges of said converging sidewalls, said rear wall having an opening therein communicating with one end of said trough, a closure member for said opening, a conveyor disposed in said trough, the end of said conveyor terminating approximately at the lower forward end of said opening, a universal fitting located substantially below the rear wall of the conveyor and beneath said opening, a second conveyor mounted at a point intermediate its ends on the fitting, one end of said second conveyor being cantilevered beneath the rear end of the first conveyor, and means for driving said conveyors.

3. In combination, a motor driven truck having a bed provided with downwardly converging sidewalls and a downwardly and forwardly converging rear wall, a trough extending longitudinally of the bed and being disposed below the lower edges of said converging sidewalls, said rear wall having an opening therein communicating with one end of said trough, a closure member for said opening, a conveyor disposed in said trough, the end of said conveyor terminating approximately at the lower forward end of said opening, a second conveyor universally mounted intermediate its ends at a point immediately beneath the rear end of the first conveyor and beneath said opening, a driving connection between said motor and the second conveyor, a second driving connection branching from the first driving connection for operating the first conveyor, and a manually operable clutch in the second driving connection whereby the first conveyor can be rendered inactive while the second conveyor operates.

4. In combination, a motor driven truck having a bed provided with downwardly converging sidewalls and a downwardly and forwardly converging rear wall, a trough extending longitudinally of the bed and being disposed below the lower edges of said converging sidewalls, said rear wall having an opening therein communicating with one end of said trough, a closure member for said opening, a conveyor disposed in said trough, the end of said conveyor terminating approximately at the lower forward end of said opening, a universal fitting located below the rear end of the conveyor and beneath said opening, a second conveyor mounted at a point intermediate its ends on the fitting, one end of said second conveyor being cantilevered beneath the rear end of the first conveyor, a driving connection between said motor and the second conveyor, a second driving connection branching from the first driving connection for operating the first conveyor, and a manually operable clutch in the second driving connection

whereby the first conveyor can be rendered inactive while the second conveyor operates.

5. In combination, a motor driven truck having a bed provided with downwardly converging sidewalls and a downwardly and forwardly converging rear wall, a trough extending longitudinally of the bed and being disposed below the lower edges of said converging sidewalls, said rear wall having an opening therein communicating with one end of said trough, a closure member for said opening, a conveyor disposed in said trough, the end of said conveyor terminating approximately at the lower forward end of said opening, a second conveyor having a fitting universally mounted beneath the rear end of the first conveyor and beneath said opening, means for driving both of said conveyors in unison, and means for rendering the first conveyor inactive while the second conveyor continues to operate.

6. In combination, a motor driven truck having a bed provided with downwardly converging sidewalls and a downwardly and forwardly converging rear wall, a trough extending longitudinally of the bed and being disposed below the lower edges of said converging sidewalls, said rear wall having an opening therein communicating with one end of said trough, a closure member for said opening, a conveyor disposed in said trough, the end of said conveyor terminating approximately at the lower forward end of said opening, a universal fitting located substantially below the rear end of the conveyor and beneath said opening, a second conveyor mounted at a point intermediate its ends on the fitting, one end of said second conveyor being cantilevered beneath the rear end of the first conveyor, means for driving both of said conveyors in unison, and means for rendering the first conveyor inactive while the second conveyor continues to operate.

7. In combination, a motor driven truck having a bed provided with downwardly converging sidewalls and a downwardly and forwardly converging rear wall, a trough extending longitudinally of the bed and being disposed below the lower edges of said converging sidewalls, said

rear wall having an opening therein communicating with one end of said trough, a closure member for said opening, a conveyor disposed in said trough, the end of said conveyor terminating approximately at the lower forward end of said opening, a second conveyor having one end thereof universally mounted beneath the rear end of the first conveyor, and beneath said opening, said motor having a clutch pedal and a transmission gear, a second gear engageable with said transmission gear, a driving connection between said second gear and said conveyors, means operable from the rear of the truck body at a point near said opening for operating a motor clutch pedal, and means operable from the rear of the truck at a point near said opening for shifting said second gear into and out of engagement with the transmission gear.

8. In combination, a motor driven truck having a bed provided with downwardly converging sidewalls and a downwardly and forwardly converging rear wall, a trough extending longitudinally of the bed and being disposed below the lower edges of said converging sidewalls, said rear wall having an opening therein communicating with one end of said trough, a closure member for said opening, a conveyor disposed in said trough, the end of said conveyor terminating approximately at the lower forward end of said opening, a universal fitting located substantially below the rear wall of the conveyor and beneath said opening, a second conveyor mounted at a point intermediate its ends on the fitting, one end of said second conveyor being cantilevered beneath the rear end of the first conveyor, said motor having a clutch pedal and a transmission gear, a second gear engageable with said transmission gear, a driving connection between said second gear and said conveyors, means operable from the rear of the truck body at a point near said opening for operating the motor clutch pedal, and means operable from the rear of the truck at a point near said opening for shifting said second gear into and out of engagement with the transmission gear.

REUBEN E. WALL.