

Oct. 4, 1955

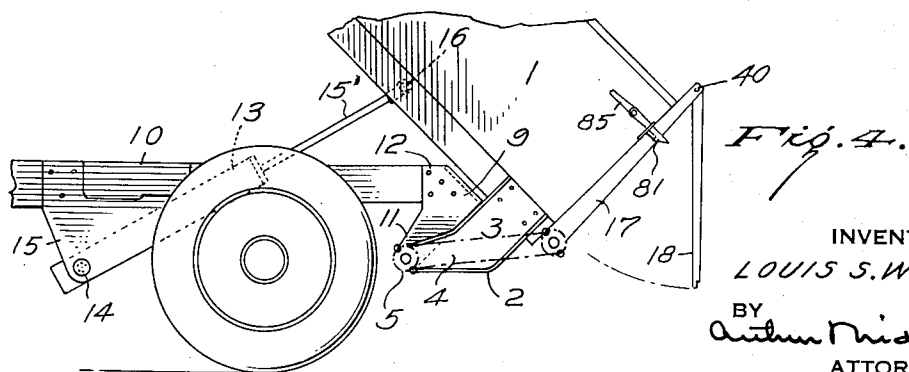
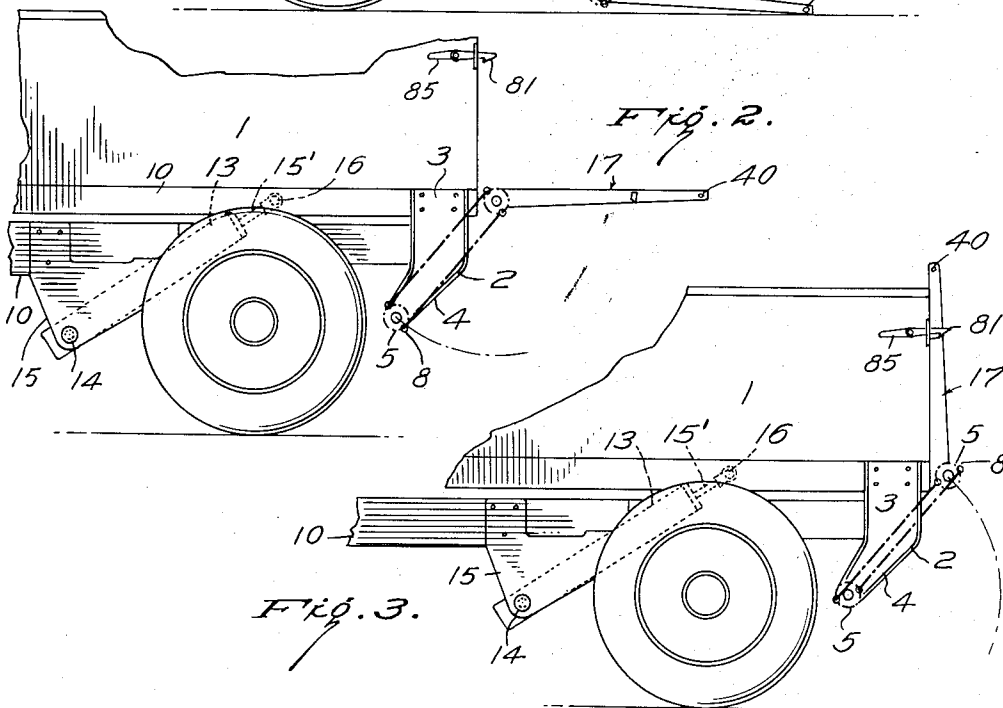
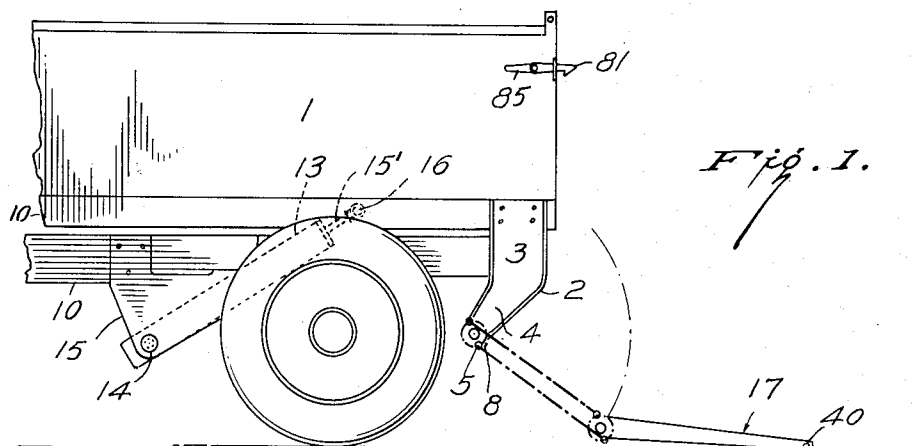
L. S. WOOD

2,719,637

DUMP TRUCK WITH VALVE CONTROL FOR THE TAIL GATE

Original Filed July 25, 1951

7 Sheets-Sheet 1



INVENTOR
LOUIS S. WOOD,
BY
Arthur Missolton
ATTORNEY

Oct. 4, 1955

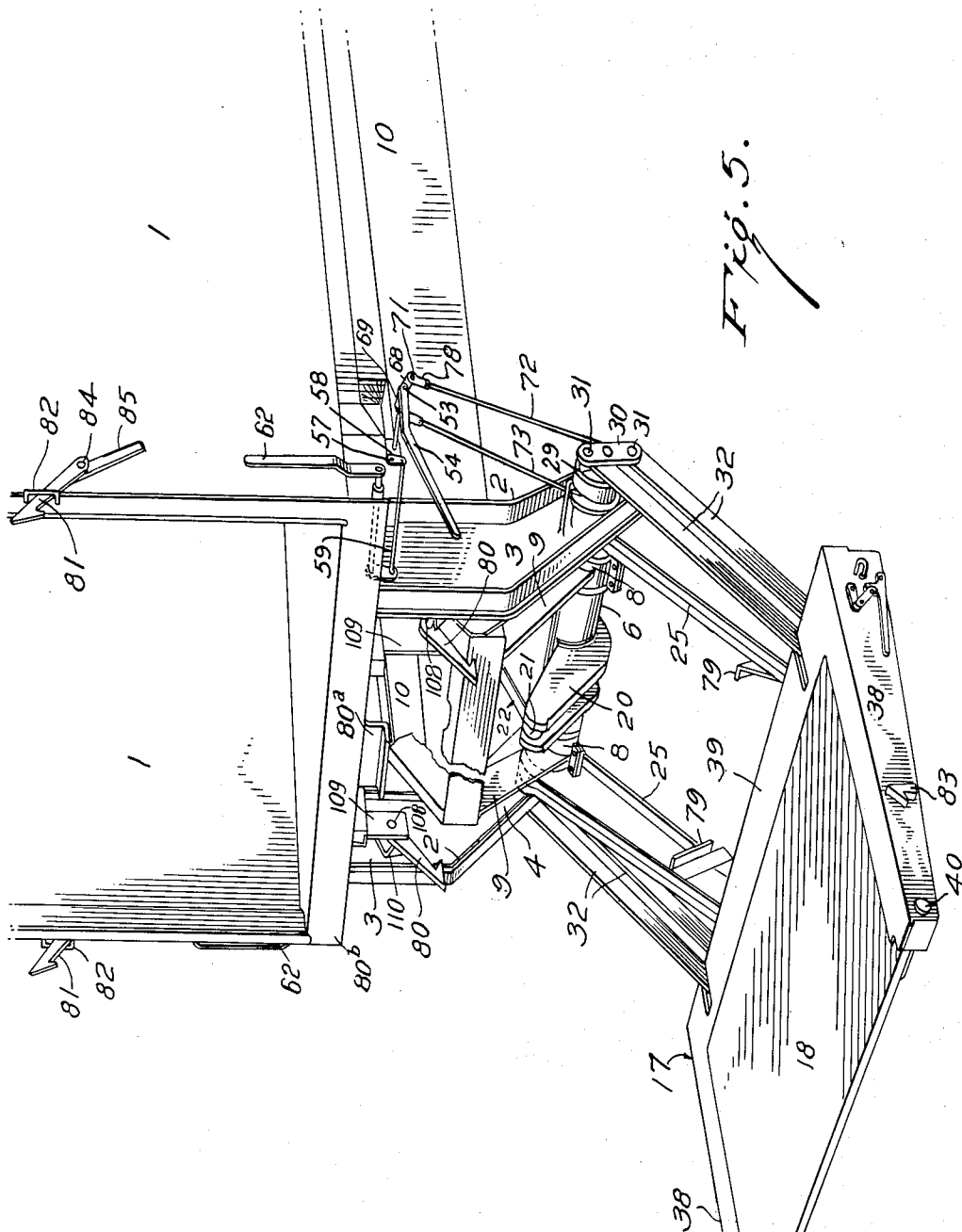
L. S. WOOD

2,719,637

DUMP TRUCK WITH VALVE CONTROL FOR THE TAIL GATE

Original Filed July 25, 1951

7 Sheets-Sheet 2



INVENTOR
LOUIS S. WOOD,
BY
Arthur M. Misdorfer
ATTORNEY

Oct. 4, 1955

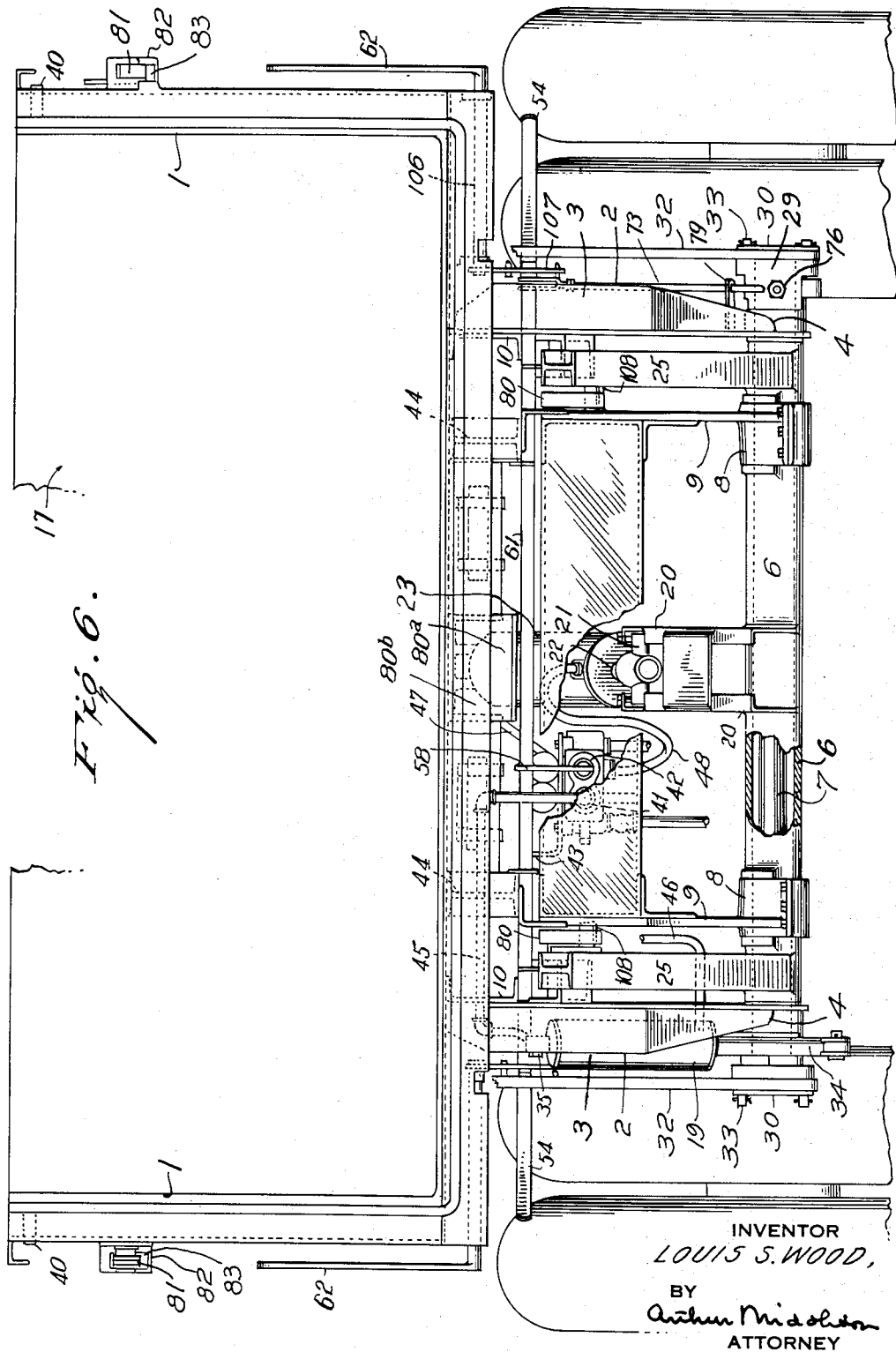
L. S. WOOD

2,719,637

DUMP TRUCK WITH VALVE CONTROL FOR THE TAIL GATE

Original Filed July 25, 1951

7 Sheets-Sheet 3



Oct. 4, 1955

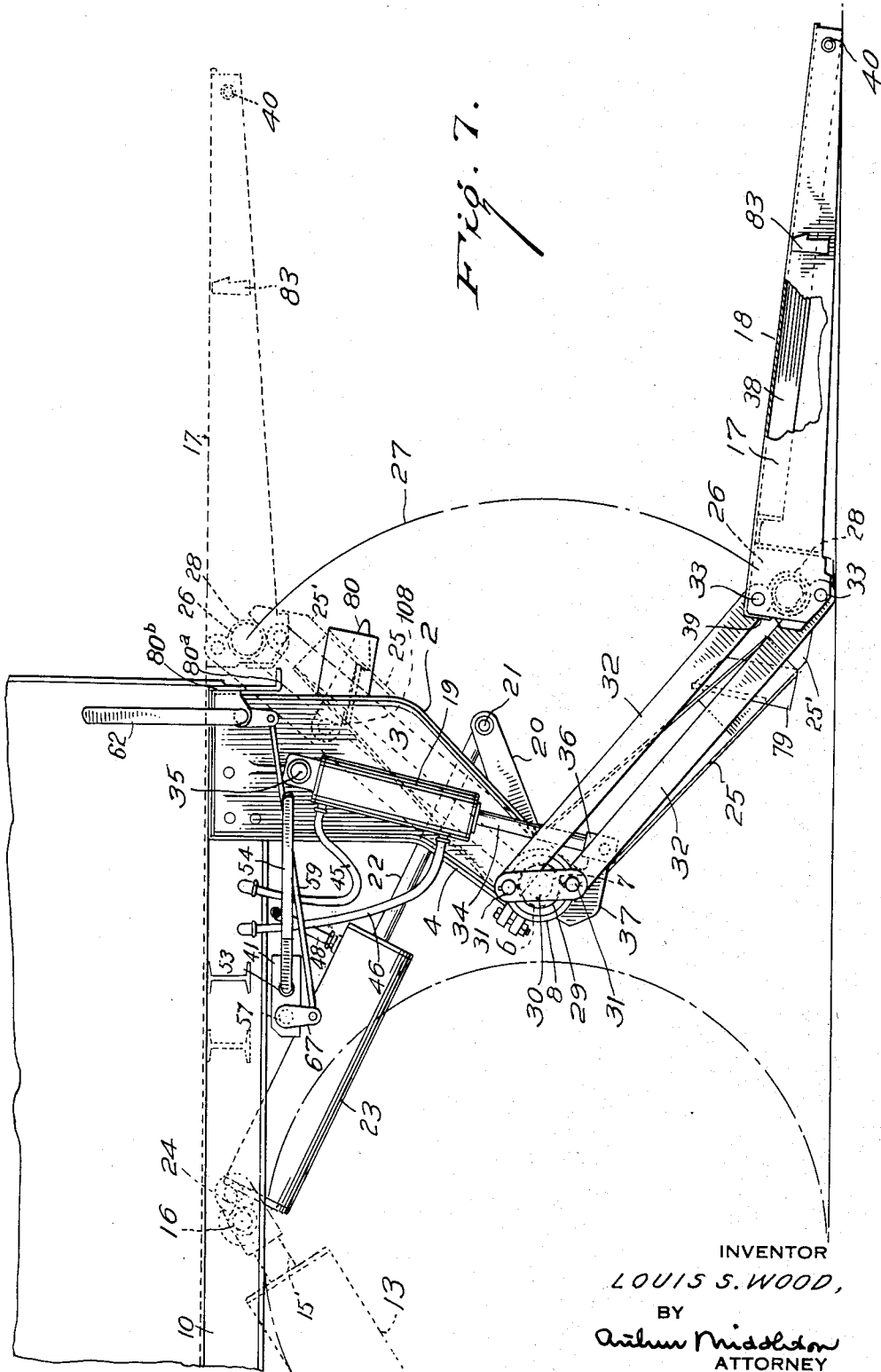
L. S. WOOD

2,719,637

DUMP TRUCK WITH VALVE CONTROL FOR THE TAIL GATE

Original Filed July 25, 1951

7 Sheets-Sheet 4



Oct. 4, 1955

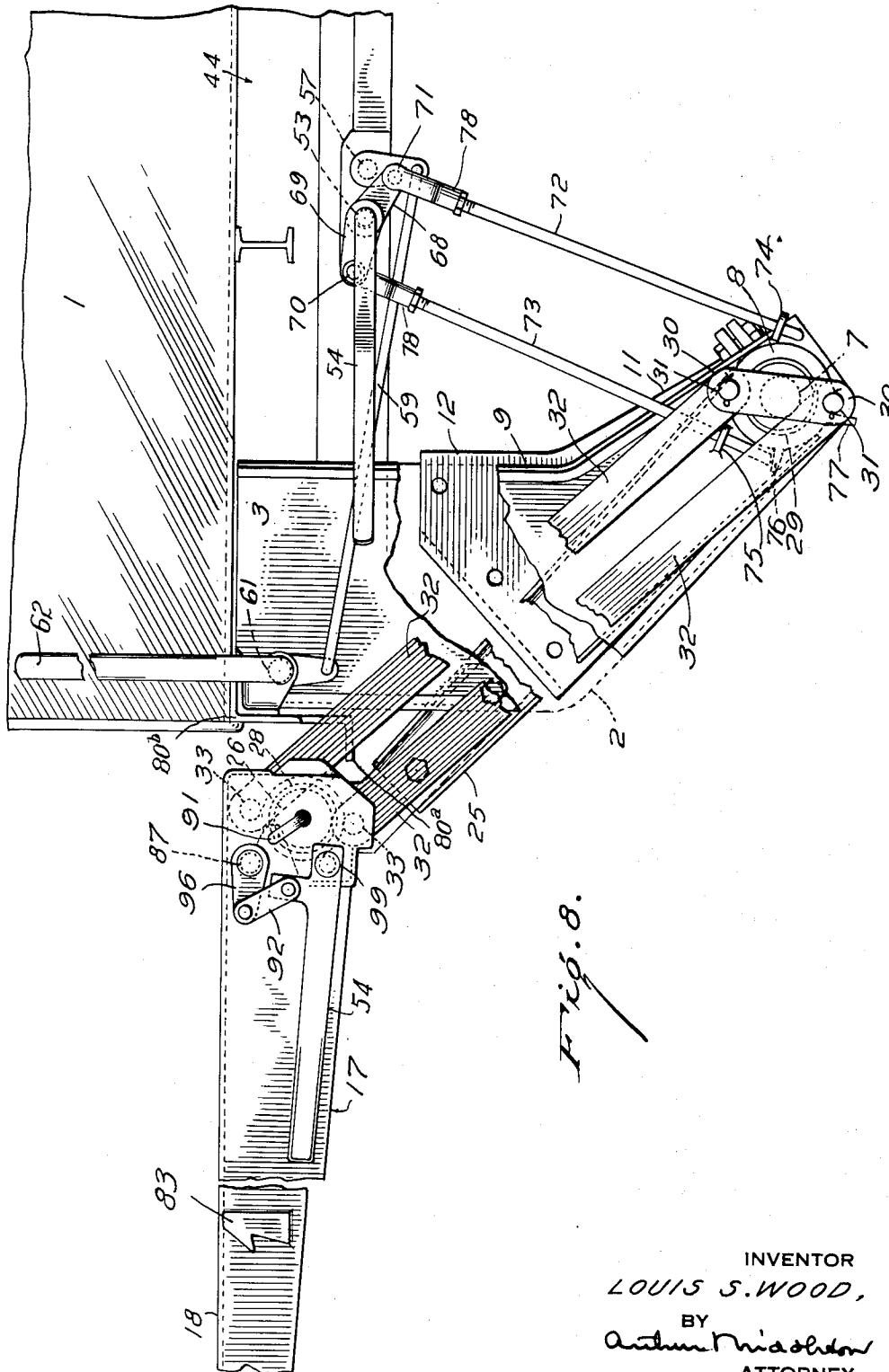
L. S. WOOD

2,719,637

DUMP TRUCK WITH VALVE CONTROL FOR THE TAIL GATE

Original Filed July 25, 1951

7 Sheets-Sheet 5



Oct. 4, 1955

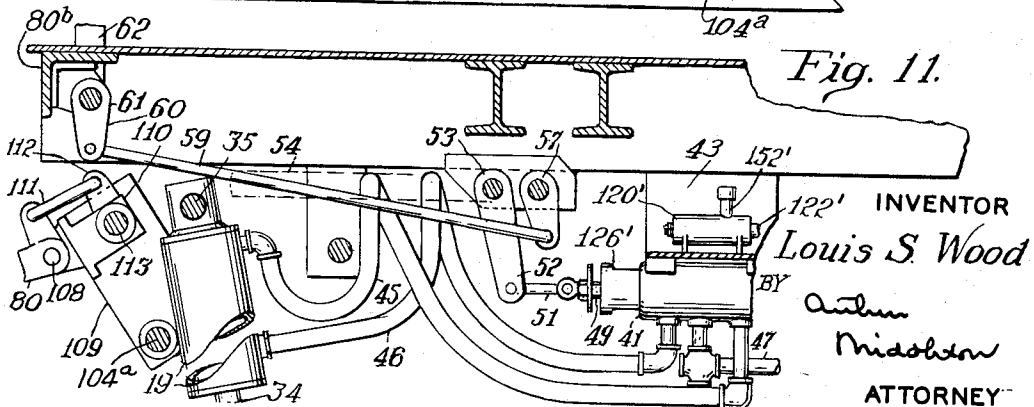
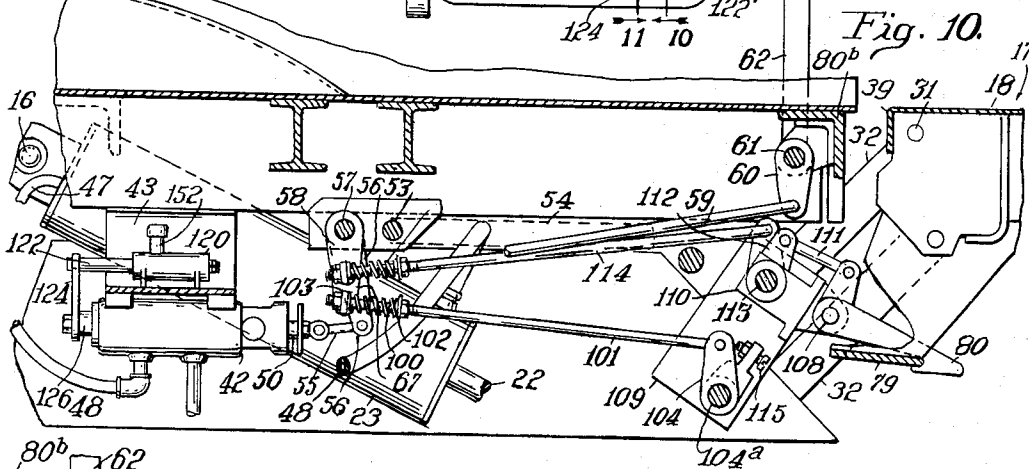
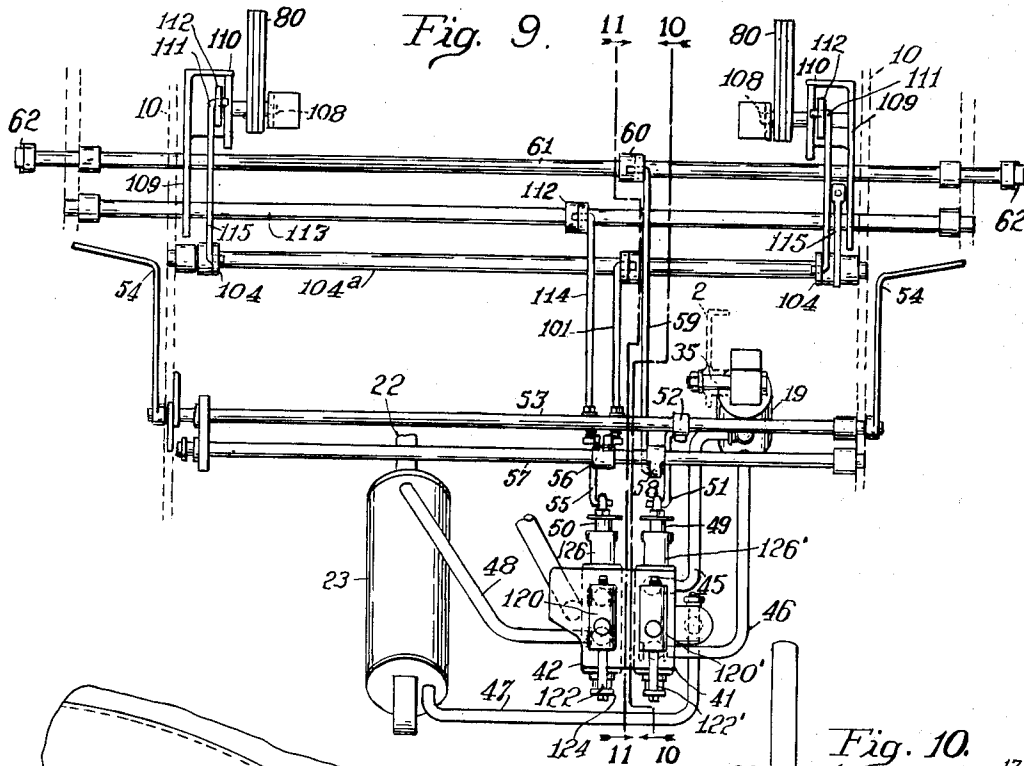
L. S. WOOD

2,719,637

DUMP TRUCK WITH VALVE CONTROL FOR THE TAIL GATE

Original Filed July 25, 1951

7 Sheets-Sheet 6



INVENTOR
Louis S. Wood
BY *Arthur*
Midson
ATTORNEY

Oct. 4, 1955

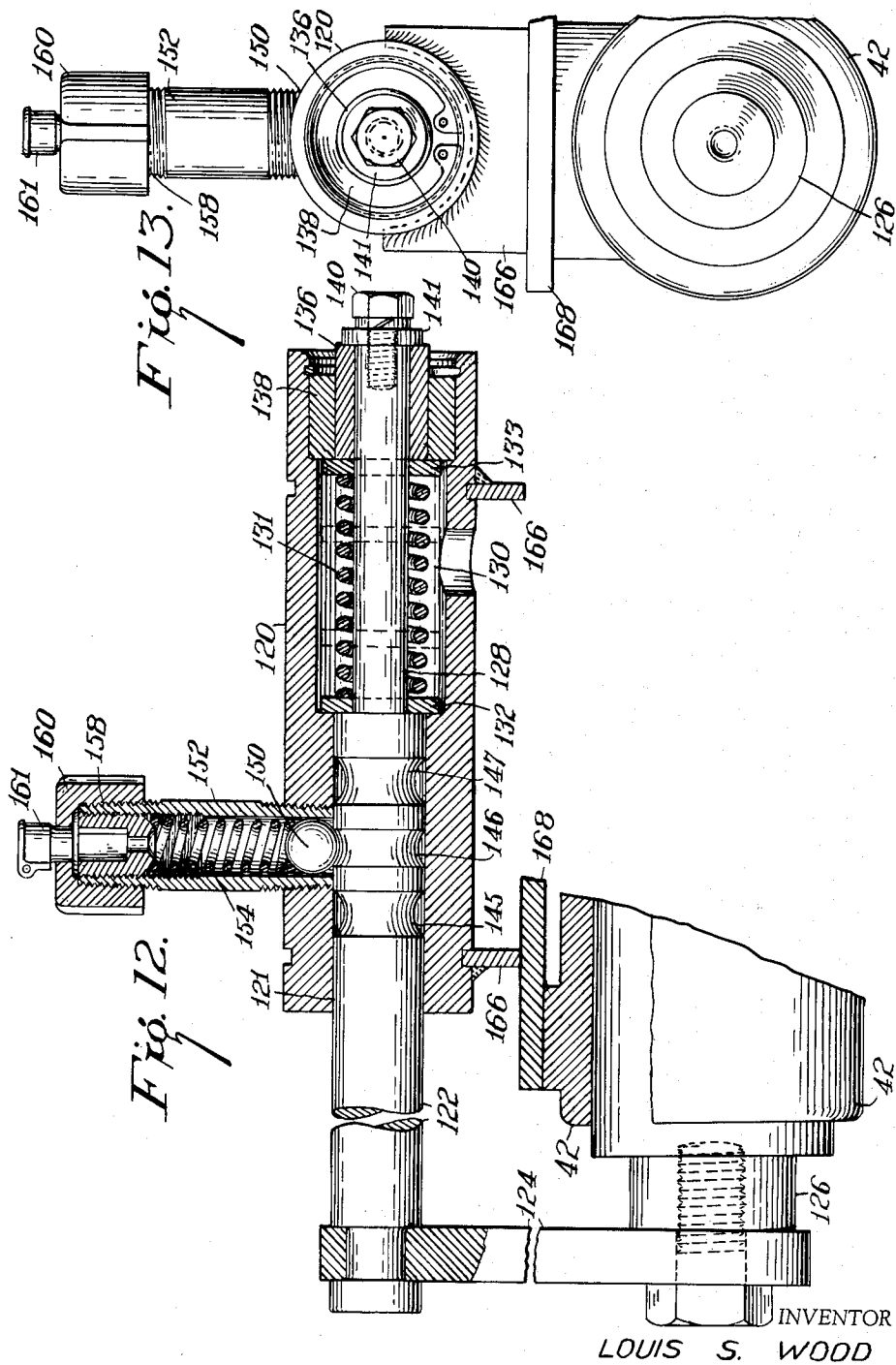
L. S. WOOD

2,719,637

DUMP TRUCK WITH VALVE CONTROL FOR THE TAIL GATE

Original Filed July 25, 1951

7 Sheets-Sheet 7



INVENTOR
LOUIS S. WOOD

BY *Arthur Mission*

ATTORNEY

1

2,719,637

DUMP TRUCK WITH VALVE CONTROL FOR THE TAIL GATE

Louis S. Wood, Findlay, Ohio, assignor, by mesne assignments, to L. A. Young Spring & Wire Corporation, Detroit, Mich., a corporation of Michigan

Original application July 25, 1951, Serial No. 238,443, now Patent No. 2,683,545, dated July 13, 1954. Divided and this application September 21, 1953, Serial No. 381,421

4 Claims. (Cl. 214—77)

This invention relates to tail gate mechanisms for trucks and the like and more particularly to a power-operated mechanism for raising and lowering a tail gate serving as a platform or elevator for lifting and lowering heavy articles which are to be loaded upon or removed from the truck, the gate not only serving as a loading platform but also as a closure for the rear end of the truck body and including in its construction an auxiliary gate or port gate which is mounted for independent opening or closing movement and thus allowed to be swung to an opened position while the main gate is in a raised and closed position.

The present application constitutes a division from my copending application filed July 25, 1951, and having Serial No. 238,443 and now Patent No. 2,683,545 granted July 13, 1954.

One object of the invention is to provide tail-gate operating mechanism which is power operated and has improved means for controlling raising and lowering of the tail-gate and opening and closing of the auxiliary port gate, the operating mechanism being controlled by a lever actuated by the person having charge of the truck.

Another object of the invention is to provide a novel mechanism for automatically holding the control lever and associated mechanism in an operating position as desired until mechanically or manually changed and thus eliminate the necessity of having to hold the control lever when operating the tail gate.

Another object of the invention is to provide improved tail-gate operating mechanism which is simple in construction, easy to operate, and capable of withstanding rough usage without being broken or otherwise damaged.

With these and other objects in view, the invention consists of a novel construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings and set forth in the appended claims, it being understood that the various changes in form, proportions and details of construction within the scope of the claims may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages gained thereby.

In the accompanying drawings:

Fig. 1 is a side elevation showing the rear portion of a truck with the tail-gate in a lowered position;

Fig. 2 is a view similar to Fig. 1 showing the tail-gate flush with the floor of the truck;

Fig. 3 shows the tail-gate closed;

Fig. 4 is a side elevation showing the truck body tilted to a dumping position and the port gate released and swung outwardly to its released position;

Fig. 5 is a perspective view showing the rear portion of the truck with the tail-gate lowered and in the position shown in Fig. 1;

Fig. 6 is a rear view of the truck;

Fig. 7 is a side elevation looking at one side of the truck with the tail-gate in its lower position;

Fig. 8 is a view looking at the other side of the truck with the tail-gate level with the floor of the truck;

2

Fig. 9 is a fragmentary plan view upon an enlarged scale showing the mechanism for operating the tail-gate; Fig. 10 is a sectional view taken vertically along the line 10—10 of Fig. 9;

Fig. 11 is a similar view taken along the line 11—11 of Fig. 9;

Fig. 12 is a view partially in elevation and partially in section showing upon an enlarged scale an adjustable pre-loaded valve centering mechanism for holding a valve in a desired operating position until manually or mechanically released;

Fig. 13 is an end view of Fig. 12.

In the accompanying drawings, in which is illustrated one embodiment of the invention, the dumping truck is provided with a dumping body 1 provided at opposite sides of its rear end with depending bearing brackets 2 constructed of any suitable material such as flanged metal, consisting of a vertical upper oblong portion 3 and a tapered inclined lower portion 4 extending downwardly and forwardly and provided at its lower end with a bearing 5. The bearings of the brackets 2 receive and have journaled in them for rotary movement an outer transverse rockable hollow shaft 6 which has journaled within it for rotary movement an inner transverse rockable shaft 7. The outer transverse shaft 6 is journaled in suitable bearings 8 of bearing brackets 9 located at opposite sides of the truck and secured to the chassis 10 thereof and the lower portions 11 of the bearing brackets 9 extend downwardly and forwardly at an inclination from the upper attached portions 12 of the bearing brackets 9.

The dumping body which pivots on the outer shaft 6 is tilted from the horizontal position illustrated in Figs. 1 to 3, inclusive, to the inclined position shown in Fig. 4 by the usual hydraulically operated means including spaced cylinders 13 located at opposite sides of the chassis of the truck and arranged at an inclination and pivoted at their lower ends at 14 to depending bearing brackets 15 secured to the chassis of the truck, as clearly illustrated in Figs. 1 to 4, inclusive. The piston 15' of each cylinder 13 is pivotally connected at 16 to the dumping body at the bottom thereof below the upper face of the floor of the same. The hydraulic power means for operating the dumping body is of the usual conventional means and is valve controlled within the cab of the truck and further illustration and description of the power means for operating the dumping body are believed to be unnecessary as the dumping body operates in the usual manner and is tilted from its normal horizontal position to an inclined dumping position and automatically returns to its initial horizontal position after the discharge of its contents when the piston 15' is relieved of hydraulic pressure in the usual manner.

The particular means for pivotally mounting the dumping body is important as the dumping body is pivotally supported from the same duplex shaft, consisting of the inner shaft 7 and the outer shaft 6 and from which the tail-gate 17 and port-gate 18 are operated and about which the body 1 is tiltable or dumpable. Also important are the construction and arrangement of the brackets which tiltably support the rear end of the dumping body from said shaft which permit the body when in dumping position to clear the other parts of the truck, whereby the dumping end of the body can closely approach the ground.

Details of tail-gate raising and lowering mechanism

While the invention is directed primarily to a power-operated tail-gate capable of being applied to a dump-body and provided with an independently operable dumping inner or port-gate 18 in the main tail-gate 17, it also includes a number of features that cooperate to make such a combination operable satisfactorily. In my pre-

ferred embodiment of this invention the tail-gate raising and lowering mechanism on the one hand and on the other hand the tail-gate operating mechanism to move it between horizontal and vertical positions, both function from said duplex operating shaft that has one shaft concentrically arranged within the other in a way that rotation of the outer shaft causes the raising and lowering of the power tail-gate while the rotation of the inner shaft causes movement of the tail-gate between the horizontal and vertical. So, in obtaining the object of this invention, this duplex shaft that extends transversely of the truck must be operatively supported from the truck chassis at an elevation below the top of the chassis and sufficiently inboard from the tail-gate so that there is no interference of these mechanisms with the full dumping operation of the truck body and the tail-gate. This is accomplished by the angle or knee-shaped brackets 2 which must be long enough to provide for the support of a cylinder 19 and its mechanism for swinging the tail-gate between horizontal and vertical while at the same time making unnecessary too long a reach between the inner of the concentric shafts and the tail-gate.

The outer shaft 6 is provided at its central portion with a pair of arms 20 extending upwardly and rearwardly at an inclination when the tail-gate is in its lowered position, as illustrated in Fig. 5, and having secured between their outer ends by a pivot 21 the outer end of a piston 22 of a cylinder 23 arranged at an inclination and extending downwardly and rearwardly from the truck body 1 and connected at its upper end to the same by a suitable pivot 24 at a point below the upper face of the bottom of the truck body.

The outer shaft 6 is also provided adjacent its ends with a pair of lifting arms 25 rigidly connected with the outer shaft 6 which preferably comprises I-beams or other suitable material having the required strength. The lifting arms 25 are provided at their outer ends with plates 25' rigidly secured to the lifting arms in any suitable manner and connected at their outer ends with the tail-gate adjacent the lower edge thereof by a pivot 26. When pressurized fluid is introduced into the cylinder 23 for actuating the piston 22, the outer shaft is rotated for oscillating the lifting arms 25 for lowering the tail-gate from a horizontal position level with the floor of the truck body to the ground and for elevating the tail-gate to return it from its ground position to its elevated position flush with the floor of the body 1 of the truck for enabling a load to be lifted from the ground and readily transferred into the truck body. The lifting arms 25 swing through an arc indicated by the dot-and-dash line 27 of Fig. 7 and the tail-gate is carried in a substantially horizontal position from one point to the other and vice versa, and it constitutes a platform on which the operator may stand while the load is being transferred from the ground to the body of the truck or from the truck to the ground.

Tail-gate swinging mechanism and operation

The pivot 26 preferably consists of a transverse shaft journaled in suitable eyes 28 of the tail-gate and it constitutes a pintle on which the tail-gate swings in lowering it from a vertical closed position to the open horizontal position illustrated in Fig. 2 of the drawings and indicated by dotted lines in Fig. 7. The enlarged ends 29 of the inner shaft are extended beyond the ends of the outer shaft and are provided with terminal oppositely extended radially disposed arms 30 which are connected by pivots 31 to the adjacent ends of the pair of spaced parallel links 32 preferably consisting of flat bars connected by pivots 33 to the hinged lower edges of the tail-gate at opposite sides of the pintle or pivot shaft 26. The inner shaft is adapted to be rotated to carry the arms 30 through an arc of approximately 45° and this motion is transmitted by the parallel links 32 to the tail-gate which is adapted to be swung downwardly from the closed

position shown in Fig. 3 to the horizontal position shown in Fig. 2 and also to be swung upwardly from the horizontal position shown in Fig. 2 to its vertical closed position shown in Fig. 3. Any other suitable link connection may, of course, be provided for transmitting motion from the inner shaft to the tail-gate for swinging the same on its horizontal shaft or pintle 26.

This rotary movement of the inner shaft 7 is effected by a piston 34 operating in the cylinder 19 extending longitudinally of one of the angle bearing brackets 2 of the body 1 and arranged at a slight inclination and connected at its upper end by a suitable pivot 35 to the bracket 2 on which it is mounted.

The lower end of the piston 34 is connected by a pivot 36 to an angle arm 37 fixed to the adjacent outer extended end of the inner shaft 7 and extending downwardly and rearwardly therefrom, as clearly illustrated in Fig. 7 of the drawing.

The tail-gate 17 and the dump or port-gate 18 are operable as a unit in swinging the tail-gate from a vertical to a horizontal position to open it, and also when lowering the tail-gate from an elevated horizontal position contiguous to the floor of the body of the truck to the ground and while elevating the tail-gate to said horizontal position and also while swinging the tail-gate from said horizontal position to its vertical closed position. The tail-gate unit comprises a frame composed of spaced parallel side portions 38 and a connecting bottom portion 39 and the dump or port-gate consists of a panel connected at its upper edge to the upper ends of the sides 38 by suitable pivots 40, but the panel may be pivoted within the frame of the tail-gate in any other suitable manner. The inner edges of the sides 38 and the connecting bottom portion 39 of the frame of the tail-gate are arranged flush with the inner faces of the side walls of the body and the bottom of the body when the tail-gate is closed so that when the body is dumped and the port-gate is unlatched, the entire contents of the body of the truck may be discharged through the opening in the tail-gate without any interference of the frame of the tail-gate to the complete discharge of the contents of the truck.

Hydraulic system and valve control mechanism

A hydraulic pump, not shown, adapted to be driven by any suitable means, as by the motor of the truck, is connected to each of a pair of hydraulic valves 41 and 42 supported by a transverse frame member 43 secured to laterally spaced longitudinal frame members 44. The valve 41 communicates by hydraulic lines 45 and 46 with the spaces between the ends of the cylinder 19 and the piston 34 which is connected to the inner shaft 7. The other valve 42 is connected by the hydraulic line 48 with the cylinder 23 and the piston 22 which is connected with the outer shaft 6.

The valves 41 and 42 which may be of any preferred type are preferably constructed substantially the same as shown and described in my prior Patent 2,469,321, and when the valve stems 49 and 50 are moved inwardly to the limit of their inward movement they open the valves to connect the cylinders 19 and 23 to the pump and when the valve stems are carried to the limit of their outward movement communication between the cylinders 19 and 23 through the hydraulic lines 45 and 48 with the pump is cut off and the hydraulic lines are placed in communication with a sump for exhausting pressurized fluid from the cylinders and at the same time admitting pressurized fluid to the other end of the cylinder 19 through the hydraulic line 46 for returning the piston to its initial position. The valves, as explained in said patent, may be moved to a position effective to disconnect the pump from the cylinders 19 and 23 and maintain a fluid lock within the cylinders.

It will be understood, as explained in said Patent 2,469,321, that the operation of the valve 42 prevents any passage of fluid to the valve 41. The stem 49 of the

5

valve 41 may be moved inwardly simultaneously with a similar movement of the stem 50 of the valve 42, but it is only upon outward movement of the latter stem to its outward position that pressurized fluid may flow through the valve to the cylinder 23. Thus the cylinders 19 and 23 may be operated independently of each other but not simultaneously.

The valve stem 49 is connected by a link rod 51 with an arm 52 of a transverse control or operating rock shaft 53 journaled in suitable bearings of the frame of the truck body and extending transversely thereof from one side of the truck body to the other side of the same and provided at each end with an operating handle 54. The operating handles 54, which are approximately L-shaped, extend at each side of the truck body to points within easy reach of a person standing at the side of the truck.

The valve stem 50 of the valve 42 is connected by a link rod 55 with an inner depending arm 56 of a transverse rock shaft 57 journaled in suitable bearings of the truck body frame and provided with an outer depending arm 58. The outer depending arm 58 is connected by a link rod 59 with a depending arm 60 of an operating shaft 61 journaled in suitable bearings of the frame of the truck body and extending across the same and provided at each end with an upwardly extending operating arm or handle 62. The control mechanism for operating the valve stem 50 of the valve 42 is adapted to be operated from either side of the truck.

When the control valve 42 is operated to introduce pressurized fluid into the cylinder 23 for elevating the tail-gate from the ground position shown in full lines in Fig. 6 to its dotted line position illustrated in said figure, wherein the tail-gate is still in its horizontal position but flush with the floor of the body of the truck, the tail gate is automatically stopped in the dotted line position by means operable by the outer shaft 6 to which the lifting arms are connected. The rock shaft 57 is slidably held in the guide member 103 through which the front end of the rod 101 passes, as shown in Fig. 10. The rear end of the rod 101 is connected to a crank or lever arm 104 arranged in an upright position on the shaft 104^a, which is suitably journaled in body hinge. The rod 101 and the arm 104 are movable rearwardly from the position illustrated in Fig. 10 of the drawings. Adjacent the arm 104 and carried by the shaft 104^a is an adjustable abutment screw 115 which is contacted by one of the lifting arms 25 when the gate reaches the raised horizontal position shown indicated by dotted lines in Fig. 7. The shaft 104^a is rotated counterclockwise upon the lifting arm 25 striking the screw 115. This causes forward longitudinal movement of the rod 101 beyond the position illustrated in Fig. 10 for enabling the coil spring 100 to bias the arm 67 and the rock shaft 57 in the position illustrated by dotted lines in Fig. 7. The spring permits rearward movement of the arm 67 and partial rotation of the rock shaft 57 from the dotted line position illustrated in Fig. 7 in the operation of the valve 42. The spring 100 and the rod 101 are adapted to yield to the movement of the arm 67 when the handle lever 62 is operated. Adjustment of the abutment screw 115 is made so that it will be engaged and the rod 101 actuated to shut off the flow of pressure fluid to cylinder 23 whereby the tail-gate is accurately aligned with the floor of the truck when in its dotted line raised position as shown in Fig. 7.

The lifting arms 25 are provided at their outer portions adjacent the tail-gate with lugs 79 arranged to be engaged by a pair of pivotally mounted gravity acting catches 80 arranged in the path of the lugs 79. When the lifting arms are swung upwardly to a vertical position they are automatically locked in such position to prevent the tail-gate from dropping should there be any release or failure of the hydraulic means. When the tail-gate is swung upwardly from its elevated horizontal position flush with the floor of the truck body to its vertical closed position it is automatically locked

6

in such closed position by a pair of catches 81 located at opposite sides of the truck body exteriorly of the sides thereof and extending through guides 82 and arranged to engage shouldered lugs 83 located at the opposite side edges of the tail-gate at the upper portions of the sides 38 of the frame of the tail-gate. This assures positive support for the gate when dumping. Any suitable latch means may be provided for releasably holding the port-gate 18 closed.

Rock shaft 53 is provided with a pair of oppositely extending arms 68 and 69 pivotally connected at 70 and 71 to the upper ends of a pair of operating rods 72 and 73 having their lower end portions slidable in guides 74 and 75 carried by one of the bearing brackets 2 and arranged to be engaged by abutment-forming lugs 76 and 77 projecting radially from the enlarged ends 29 of the inner shaft 7. As the tail-gate approaches its vertical position the lug 76 engages the lower end of the operating rod 73 and shifts the rock shaft 53 so as to operate the valve 41 and cut off pressure fluid to prevent further movement of the tail gate. Also when the valve 41 is operated to open the tail-gate from the dotted line position shown in Fig. 6 to the horizontal position, the lug 77 of the enlarged end 29 of the inner shaft 6 engages the lower end of the operating rod 72 and operates the valve 41 to prevent further rotary movement of the outer shaft. The operating rods 72 and 73 are provided at their upper ends with sections 78 having a threaded connection with the rods for adjusting the same for enabling the valve 41 to be accurately operated.

Details of "kick-out" valve control mechanism and operation

The control mechanism for the valves 41 and 42 includes a so-called "kick-out" lever release means, as illustrated in Figs. 12 and 13. This mechanism is operatively connected at one end of the valve assembly to a rod which controls the setting of the valve ports, and is illustrated in Fig. 12 in connection with the operation of valve 42. It will be understood that valve 41 is equipped with a kick-out control mechanism similar to that used for valve 42 and operates in the same manner. The mechanism as illustrated in Fig. 12, comprises an elongated tubular housing 120 having a central bore 121 extending lengthwise therethrough and arranged to slidably receive a spool-valve shaft 122. The shaft 122 extends outwardly from the housing 120 and is attached at its outer end through an arm 124 to the end of the valve shifting rod 50, as shown at 126. The shaft 122 has a reduced diameter portion 128 which extends through an enlarged diameter spring chamber 130. A coil spring 131 surrounds the reduced diameter shaft portion 128 and is retained under compression between the washers 132 and 133. The washers are slidably fitted in the chamber 130 and are adapted to be moved axially of the shaft to compress the spring 131 upon shifting of the shaft 122.

On the outer end of the reduced diameter portion 128 of the shaft is mounted a sleeve 136 adapted to slide in the bushing 138 which is secured in the end portion of the spring chamber 130. A stub bolt 140 is received on the outer end of the shaft and is threaded down against a washer 141 whereby the sleeve 136 is retained in place on the shaft between the washers 133 and 141.

On the enlarged diameter portion of the shaft 122 there is provided spaced circumferential grooves 145, 146 and 147 which are adapted to receive a spring-pressed ball detent 150. The spaced grooves or indentations for receiving the ball 150 cooperate with the setting of the valve rod 126 so that the valve positions correspond to the spaced groove sections on the shaft 122. The ball detent mechanism comprises a tubular casing 152 which is threaded into the body of the housing 120 and adapted to contain a coil spring 154 for varying the load on the ball 150. The lower end of the spring 154 rests on the ball detent 150, the ball being of a diameter to fit snugly into

the annular grooves 145, 146, 147 on the spool-valve 122. To provide for adjusting the spring load on the ball detent 150, the upper end of the casing 152 is threaded to receive a hollow set screw member 158 which may be threaded downwardly to vary the load on the coil spring 154. The upper end of the casing 152 of the ball detent mechanism is suitably closed by a cap 160 which is threaded on the end of the casing, as illustrated in Fig. 12. A grease cup 161 is suitably mounted on the cap 160 for conveniently applying lubrication to the ball detent 150.

The valve kick-out lever release assembly is suitably supported on the spaced leg members 166 which in turn are welded to the lower portion of the casing 120. The leg supports 166 are adapted to rest on a base plate 168 suitably mounted on the top of the valve assembly 42, as illustrated in Figs. 12 and 13.

The setting of the rod 126, which is operatively connected to the rod 50 and forms an extension thereof, is yieldably maintained in either one of three positions by the adjustable spring loaded ball detent 150. Thus when the valve rod 50 and its counterpart 126 are shifted as by manually moving the lever 62, so as to slide the valve rod, for instance, to the left, as seen in Figs. 11 and 12, the arm 124 attached to the end of the rod 126 carries the shaft 122 to the left so that the ball detent 150 is forced out of its center groove position, representing the neutral or fluid lock position, and upon further movement of the shaft 122, drops into the annular groove 147, where the parts are maintained during the operation of the hydraulic lift. The spring 154 of the ball detent is adjustably loaded, as aforementioned, by turning down the screw member 158 so that the spring load on the ball detent is just sufficient to overcome the force exerted by the compression spring 131 and which tends to return the shaft 122 to its center or fluid lock, safety position. Under this action of the spring loaded ball detent, it is unnecessary for the operator to hold his hand on the control lever for operating the hydraulic valves after the lever is moved either to the right or left, to start the desired power movement of the tail-gate mechanism.

As the end of the particular cycle of operation initiated by movement of the lever 62 or 54, the valve control rod to which the hand lever is operatively connected is manually shifted or mechanically engaged so that the ball detent 150 is forced out of its seat in the groove and the spring 130 is then permitted to return the shaft 122 to its normal center groove which represents the fluid lock, safety position. In this position all movement of the parts is stopped instantly and maintained in their relative positions. This kick-out mechanism thus provides fingertip control so that the tail-gate can be stopped instantly and at any intermediate position desired.

The coil spring 100 mounted on the rod 101 and interposed between a collar 102 on the rod and an arm member 67 of the rock shaft 57 permits lost motion between the parts whereby the manually operated control lever 62 can remain in a set position until manually moved or its connecting control rod mechanism shifted automatically by engagement therewith of a portion of the tail-gate mechanism being moved to thereby cause the shaft 122 to shift and release the ball detent from the operative position whereby the same is shifted by the coil spring 131 to its neutral, fluid lock, safety position and all movement of the parts ceases. The same action takes place upon actuation of the control lever 54 which is also provided with a similar spring actuated ball detent kick-out lever release mechanism and as shown in Fig. 11 by the prime reference characters and corresponding to the reference characters designating the described parts for operating the valve 42.

The catches 80 which are located at opposite sides of the frame of the truck body, are mounted on short shafts 108, journaled in suitable bearings of brackets 109 and provided with arms 110 which are connected by short links 111 to arms 112 of a transverse rock shaft 113 which

is connected by a link rod 114 with the arm 67 of the rock shaft 57 whereby the catches 80 will be lifted out of engagement with the lugs 79 by operation of the lever 62.

While the preferred embodiment of the invention has been shown and described, it is to be understood that this embodiment may be modified as to the details within the spirit and scope of the invention and as covered by the appended claims.

What is claimed is:

1. A truck having a wheeled chassis with a superposed body having a floor provided with a tailgate as well as tailgate lowering and raising means supported from the chassis and including an outer rockable hollow shaft having laterally extending arms fixed thereto for supporting the tailgate, hydraulic means for rocking the shaft to lower and to raise the tailgate having a piston-bearing cylinder in a pump-motivated hydraulic circuit as well as reciprocable spool-valve means for controlling the direction of motion of the piston, manually operable means both for motivating the hydraulic means and for moving the direction-controlling spool-valve to a position whereby the piston through the shaft and its arms either lowers or raises the tailgate, automatic means having an interposed spring-biasing connection and operated by at least one of the arms on the shaft when it approaches full raised position for moving the spool-valve toward piston-stopping position, and spring-tensioned detent means operable on the spool-valve as the biased spring moves the spool-valve past the detent to detain the spool-valve in neutral position to stop further movement of the piston and consequently to stop the raising movement of the tailgate at the level of the truck body's floor.

2. A truck having a wheeled chassis with a superposed body having a floor provided with a tailgate as well as tailgate lowering and raising means together with means not only for pivotally opening the tailgate to horizontal position but for pivotally closing it to vertical position with both said means supported from the chassis, the lowering and raising means including an outer rockable hollow shaft having laterally extending arms fixed thereto for supporting the tailgate, hydraulic means for rocking the shaft to lower and to raise the tailgate, manually operable means for motivating the hydraulic means, and automatic means for stopping the rising tailgate at the level of the truck body's floor; while the tailgate opening and closing means include an inner rockable shaft projecting through the outer rockable shaft while carrying enlarged ends provided with lug means and a pivoted line connection between the inner shaft and the body-abutting side of the tailgate, hydraulic means for rocking the inner shaft having a piston-bearing cylinder in a pump-motivated hydraulic circuit as well as spool-valve means for controlling the direction of motion of the piston, manually-operable means both for motivating the hydraulic means and for moving the spool-valve toward piston-stopping position, automatic means including lever means engageable by the lugs on the enlarged ends of the rockable inner shaft when that shaft approaches the limits of its rocking path, and spring-tension detent means operable on the spool-valve during engagement by the lugs with the lever means to detain the spool-valve in neutral position to stop further movement of the piston and consequently to stop the pivotal movement of the tailgate either at its vertical or at its horizontal position as the case may be.

3. A truck having a wheeled chassis with a superposed body having a floor provided with a tailgate as well as tailgate lowering and raising means together with means not only for opening the tailgate to horizontal position but for closing the tailgate to vertical position with both said means supported from the chassis; the lowering and raising means including an outer rockable hollow shaft having laterally extending arms fixed thereto for supporting the tailgate, a first hydraulic means for rocking the shaft to lower and to raise the tailgate having a first

piston-bearing cylinder in a first pump-motivated hydraulic circuit as well as a first reciprocable spool-valve means for controlling the direction of motion of the first piston, manually operable means both for motivating the first hydraulic means and for moving the first spool-valve to a position whereby the first piston through the outer shaft and its arms either lowers or raises the tailgate, first automatic means having an interposed spring-biasing connection and operated by at least one of the arms on the shaft when it approaches full raised position for moving the first spool-valve toward piston-stopping position, and spring-tensioned detent means operable on the first spool-valve as the biased spring moves that spool-valve past the detent to detain that spool-valve in neutral position to stop further movement of the piston and consequently to stop the raising movement of the tailgate at the level of the truck body's floor; the tailgate opening and closing means including an inner rockable shaft projecting through the outer rockable shaft while carrying enlarged ends each provided with lug means and a pivoted link connection between the inner shaft and the body-abutting side of the tailgate, second hydraulic means for rocking the inner shaft having a second piston-bearing cylinder in a second pump-motivated hydraulic circuit as well as a second spool-valve means for controlling the direction of the second piston, a second manually-operated means both for motivating the second hydraulic means and for moving the second spool-valve toward piston-stopping position, a second automatic means including a lever engageable by the lugs on the enlarged ends of the rockable inner shaft when that shaft approaches the limits of its rocking path, and a second spring-tensioned detent means operable on the second spool-valve during engagement by the lugs with the lever means for detaining that spool-valve in neutral position to stop further movement of the second piston and consequently to stop the pivotal movement of the tailgate either at its vertical or its horizontal position as the case may be.

4. A truck having a wheeled chassis with a superposed body having a floor provided with a tailgate as well as tailgate lowering and raising means supported from the chassis and including a rockable shaft having laterally extending arms fixed thereto for supporting tailgate, hydraulic means for rocking the shaft to lower and to raise the tailgate having a piston-bearing cylinder in a pump-motivated hydraulic circuit as well as reciprocable spool-valve means for controlling the direction of motion of the piston, said spool-valve means being spring biased to neutral position wherein the motion of the piston is stopped, means for motivating the hydraulic means, and manually operable means for moving the direction-controlling spool-valve to a position whereby the piston through the shaft and its arms either lowers or raises the tailgate, means forming an abutment fixed on said shaft, automatic means operated by said abutment when the arms on said shaft approach full raised position for moving the spool-valve toward neutral position, and spring tensioned detent means operable on the spool-valve as the automatic means and the valve biasing spring move the spool-valve past the detent to detain the spool-valve in said neutral position to stop further movement of the piston and consequently to stop the raising movement of the tailgate at the level of the truck body's floor.

References Cited in the file of this patent

UNITED STATES PATENTS

2,265,260	Argo	Dec. 9, 1941
2,362,671	Schwan	Nov. 14, 1944
2,471,285	Rice	May 24, 1949
2,570,896	Winchester	Oct. 9, 1951
2,572,705	Edman	Oct. 23, 1951

FOREIGN PATENTS

426,333	Great Britain	Apr. 2, 1935
---------	---------------	--------------