

Aug. 12, 1952

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2,606,676

TRANSPORTING EQUIPMENT FOR VEHICLES

Filed Jan. 3, 1947

5 Sheets-Sheet 1

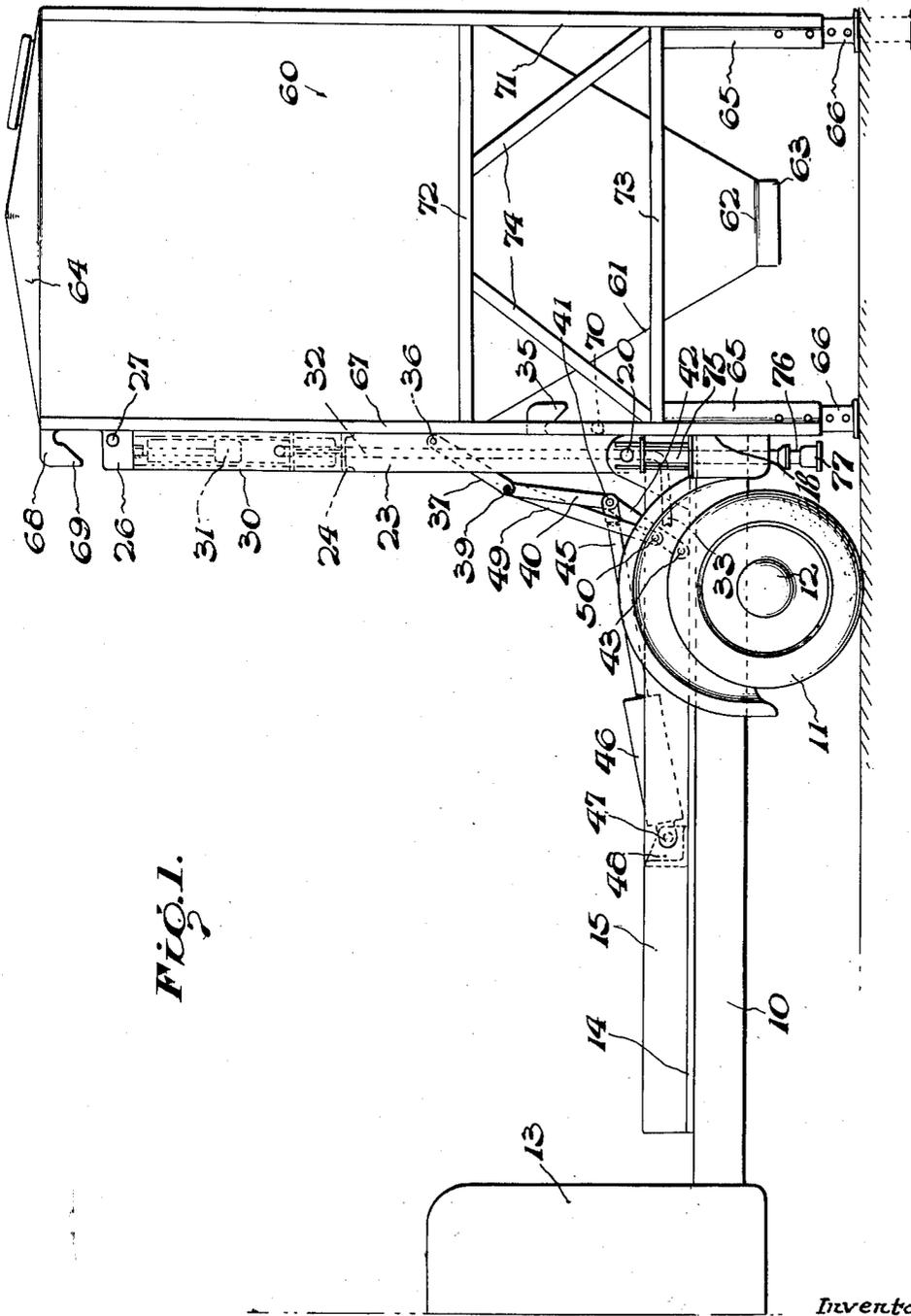


FIG. 1.

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5 Sheets-Sheet 2

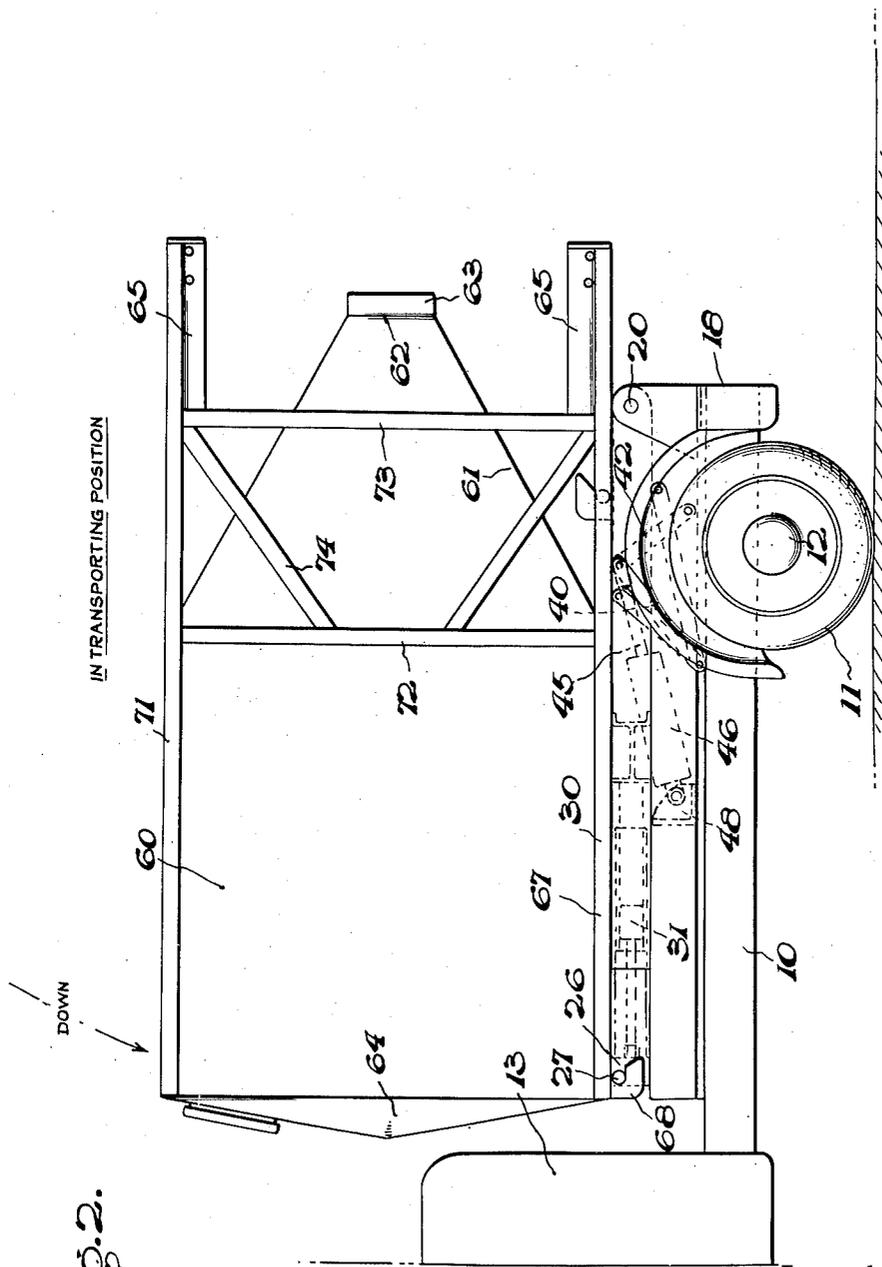


FIG. 2.

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5 Sheets-Sheet 3

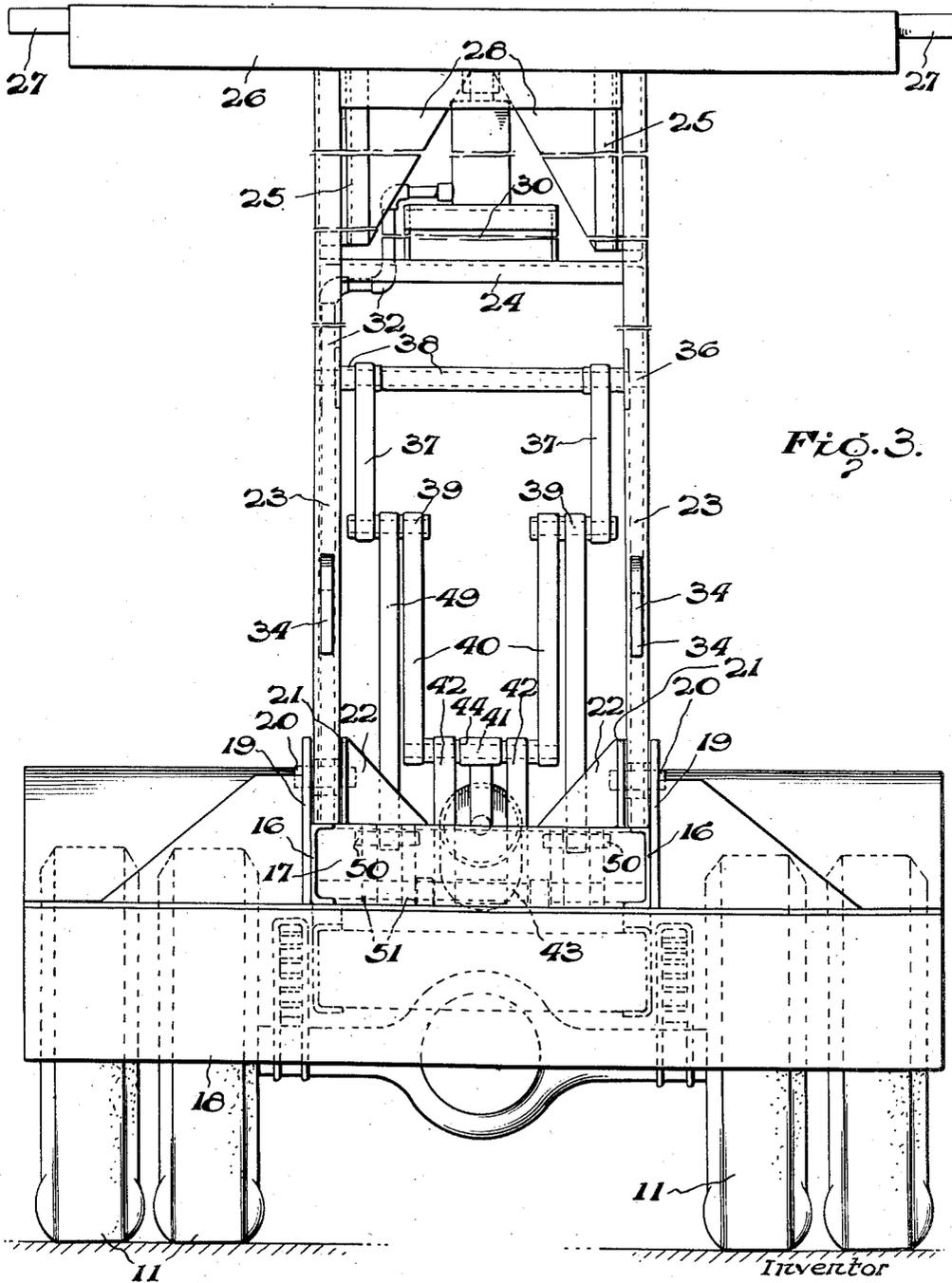


FIG. 3.

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5 Sheets-Sheet 4

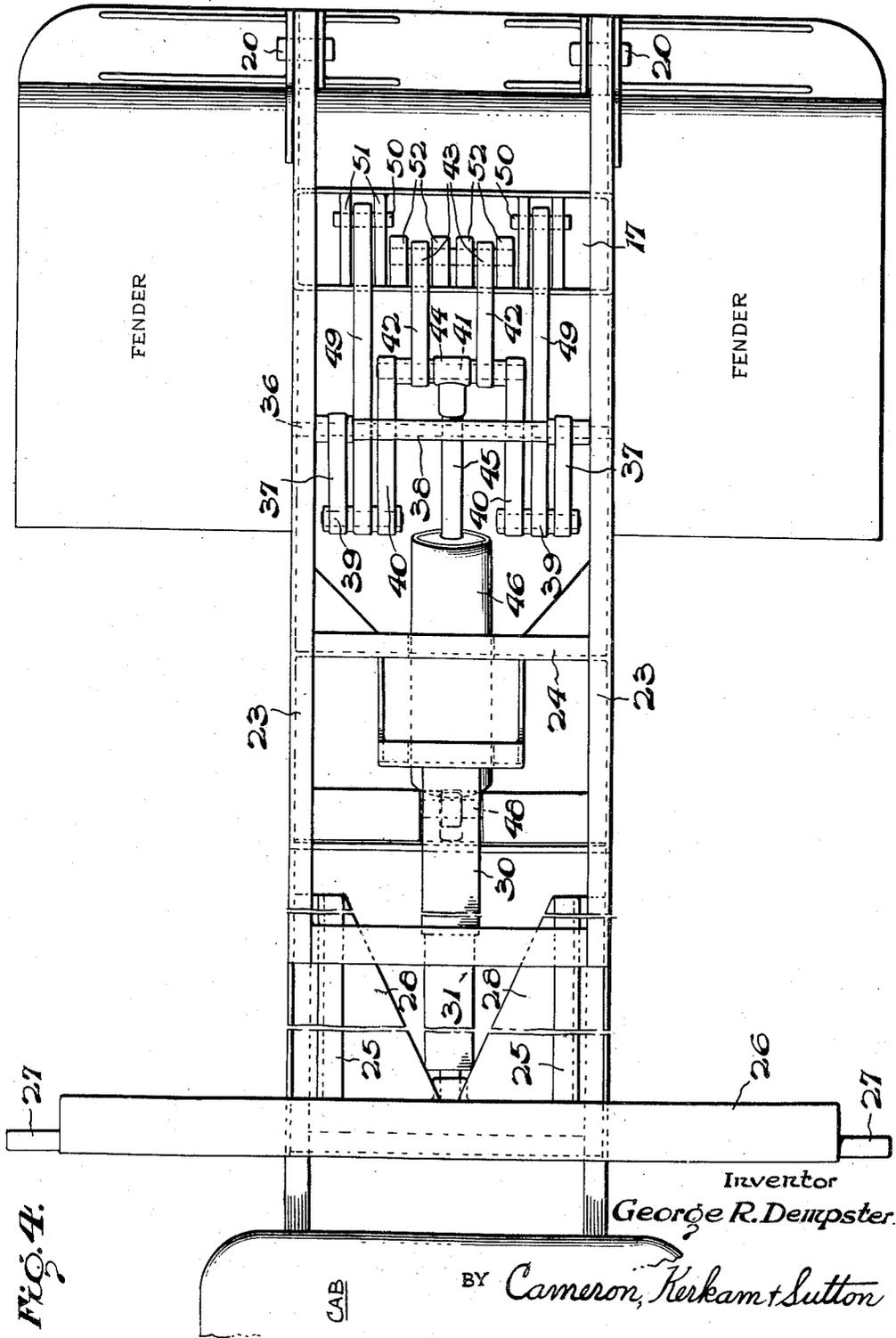


FIG. 4.

CAB

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5 Sheets-Sheet 5

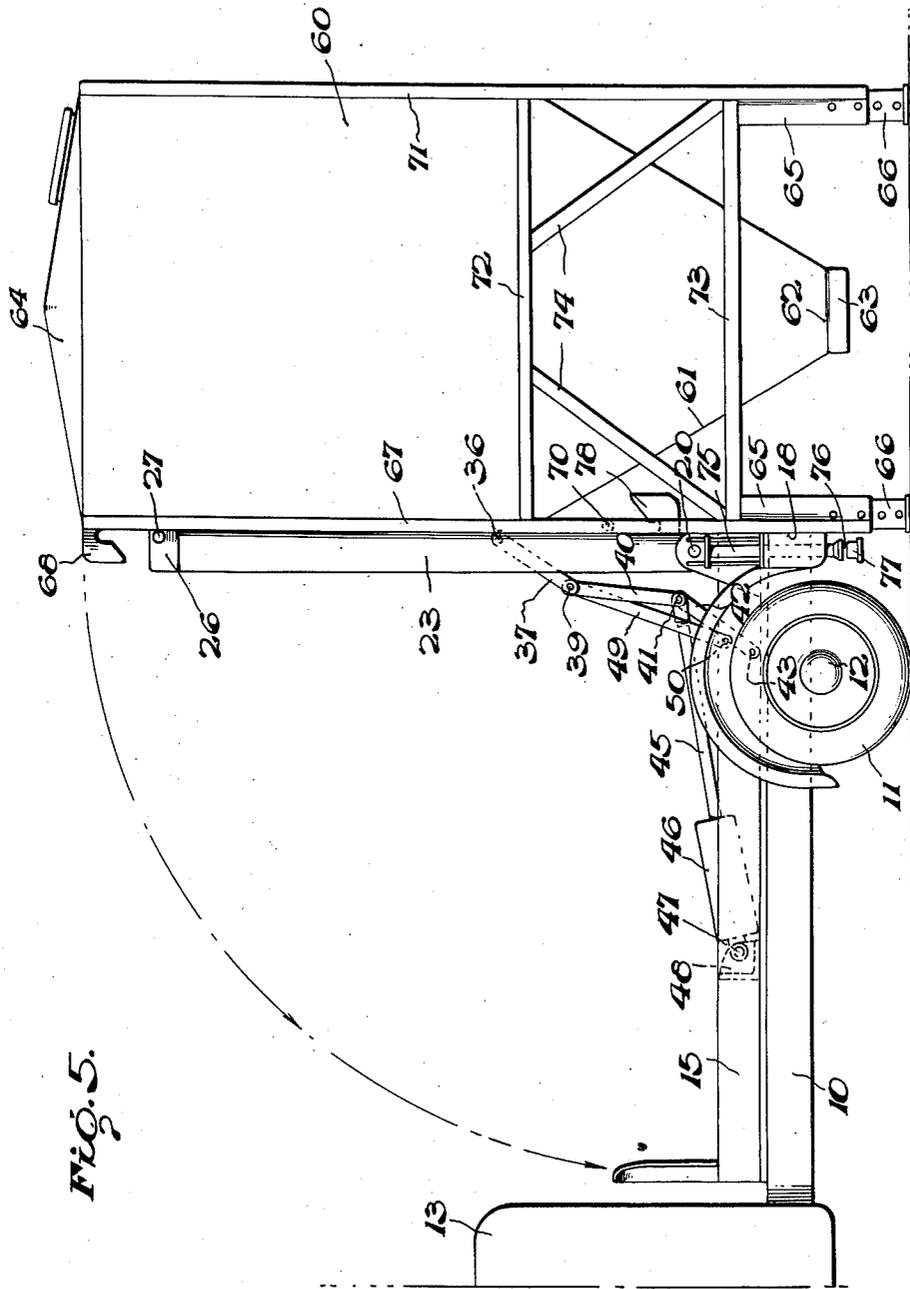


FIG. 5.

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TRANSPORTING EQUIPMENT FOR VEHICLES

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Application January 3, 1947, Serial No. 719,961

14 Claims. (Cl. 214-77)

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This invention relates to transporting equipment of the type wherein a truck or other suitable vehicle is provided with a rig whereby separate containers of suitable character may be picked up, transported and deposited or unloaded so that a single vehicle may be used for handling a plurality of containers which, when not in course of transportation, can be used independently of the truck for receiving, storing or delivering loads of any suitable material. While, as will be apparent to those skilled in the art, the invention is applicable to the handling of a wide variety of materials, and such is contemplated and intended within the broader aspects of the present invention, this invention has particular utility when applied to the transportation of mixed concrete and the like.

By using air-entrained or aerated concrete it is now possible to haul ready mixed concrete over considerable distances without danger of segregation. Thereby, effective economies may be made by disposing the concrete mixing plant or unit at a central location and transporting the mixed concrete to its several places of use without the concrete mixing plant or unit itself having to be moved to each location where the concrete is to be used. Again, it is frequently desirable to store mixed concrete at least temporarily at the location of use, as for example in oil well work, so that the concrete may be used over a substantial period of time as occasion requires, without immobilizing the concrete mixing unit or any equipment provided for transporting the concrete to its point of use.

It is an object of this invention to provide transporting equipment of the character referred to which facilitates the economical handling of concrete mixed at a central point and distributed to a plurality of locations whether for use at once or over a substantial period of time during which the mixed concrete is to be stored.

Another object of this invention is to provide a device of the type last characterized which is of such character and construction that the mixed concrete is handled, as an incident to its transportation, so as to minimize likelihood of segregation of its constituents.

Another object of this invention is to provide transportation equipment of the character referred to whereby properly mixed concrete may be delivered to separate containers which are severally and individually picked up by a transporting rig, whereupon each container is rotated through an angle on the order of 90° to a position for transportation, and thereafter at the location of use each container is again rotated through a comparable angle, so that by such changes of position of the container the concrete is so handled as to minimize segregation of its constituents.

Another object of this invention is to provide

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transporting equipment of the type more generally characterized hereinabove whereby relatively heavy loads may be readily picked up by a transporting rig and disposed in such a position that the center of gravity is well forward of the rear axle of the vehicle, and therein locked against movement with respect to the vehicle.

Another object of this invention is to provide a device of the type last characterized wherein the means for effecting the several movements of the loading and unloading devices are such that they may be readily controlled from the cab of the vehicle.

Another object of this invention is to provide transporting equipment of the character hereinbefore specified which is simple and rugged in construction, readily manipulated and applicable to a wide variety of uses, and highly efficient and economical in its handling of containers, particularly containers designed to handle relatively heavy loads, and especially mixed concrete and the like.

Other objects will appear as the description of the invention proceeds.

The invention is capable of receiving a variety of mechanical expressions two of which are illustrated on the accompanying drawings, but it is to be expressly understood that the drawings are for purposes of illustration only, and are not to be construed as definitions of the limits of the invention, reference being had to the appended claims for that purpose.

Referring in detail to the accompanying drawings, wherein the same reference characters are employed to designate corresponding parts in the several figures,

Fig. 1 is a side elevation of an embodiment of the present invention showing the container before it is picked up;

Fig. 2 is a corresponding elevation showing the load in transporting position;

Fig. 3 is a rear elevation to a larger scale of the embodiment of Figs. 1 and 2 but with the container omitted;

Fig. 4 is an enlarged plan view of the embodiment of Figs. 1, 2 and 3; and

Fig. 5 is a side elevation corresponding to Fig. 1 but illustrating another embodiment of the present invention.

Referring first to the embodiment of the invention shown in Figs. 1 to 4, inclusive, 10 designates the chassis frame, of a truck or other suitable vehicle, of any suitable size and construction and provided with suitable wheels, of which only the rear wheels 11, mounted on axle 12, are shown in the drawings. The driver's cab is diagrammatically indicated at 13 and contains the controls hereinafter referred to.

Mounted on the chassis frame 10 in any suitable way, as by interposed stringers 14, is a rig having a base frame 15, here illustrated as com-

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prising side members formed of inwardly faced channel irons 16 (see Fig. 3) which are united transversely by suitable members 17 in a manner well understood in the art so as to provide a rigid structure. Suitably attached to said base frame at the rear of the truck is a depending structure or apron 18 against which a container or other load may bear and slide when the same is raised and lowered with respect to the truck. The rear of the truck is also preferably provided with a pair of hydraulic jacks, omitted from Figs. 2 to 4 for sake of clearness but illustrated in Figs. 1 and 5, for engagement with the ground and preventing movement of the truck around the rear axle when the load to be raised or lowered is of such magnitude that when disposed rearwardly of that axle it might have a tendency to lift the forward end of the truck off of the ground.

Suitably attached to the base frame 15 at each side of the rear extremity thereof and projecting upwardly therefrom is a pair of parallel hinge plates 19 and 21 carrying suitable pivot pins or stub shafts 20. Said hinge plates may be suitably strengthened or reinforced by members 22 here shown as formed integrally with the plates 21 and suitably secured to a transverse member 17 of the subframe.

Disposed between each pair of parallel hinge plates 19 and 21 and pivotally mounted on the pivot pin or stub shaft 20 is a vertically extending side member 23 of a skid frame that also has one or more suitable transverse members 24 connecting said side members to form a rigid structure. Said skid frame also includes an extensible telescopic section, and to this end said side members 23 have inwardly facing grooves or channels in the inner faces thereof, and the extensible telescopic section includes side pieces 25 having outwardly facing ribs for sliding in the grooves or channels of said side members 23. A cross arm 26 is suitably connected to said side pieces 25 and extends transversely thereof to a width transversely of the truck proper for cooperation with the container to be described. The ends of cross arm 26 are provided with one of a pair of locking elements, such as hook and pin means, here shown as pins 27. The extensible telescopic section may also be provided with suitable reinforcing means, as gusset plates 28, to provide adequate rigidity therein.

Suitably mounted on the skid frame and here shown as carried by the transverse member 24 is the cylinder 30 of a fluid pressure device having therein a plunger and rod 31 (see Fig. 1) whose upper end is secured in any suitable way to the cross arm 26 or other proper member of the extensible section in the plane of the fore and aft axis of the base frame 15. Cylinder 30 and plunger and rod 31 may take the form of a single acting hydraulic hoist, and the interior of the cylinder 30 may be supplied with hydraulic fluid in any suitable way, as by means of piping 32 carried by one of the side members 23 of the skid frame, and in order that said cylinder 30 may be in communication with the source of pressure fluid in all positions of the skid frame one of the pins 20 is shown as hollow and has suitable connections with the piping 32 and the source of fluid under pressure. However, any other suitable connections may be used to maintain pressure in the cylinder 30 in all positions of pivotal movement of the skid frame. Fluid pressure may be developed in any suitable way, as by a hydraulic pump of any suitable construction carried by the truck and if desired driven from the engine of

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the truck but omitted from the drawing to avoid complicating the illustration. Said hydraulic mechanism includes a line diagrammatically suggested at 33 in Fig. 1 and leading to the cab of the vehicle where any suitable control means is provided, at a position of ready access for the driver, for determining admission of pressure fluid to or release of pressure fluid from the cylinder 30.

Each of the side frames 23 of the skid frame is also provided near the lower end thereof with one of a pair of locking elements, such as pin and hook means, here shown as a rearwardly extending hook member 34 having a depending extremity 35 with a forward cam face (see Fig. 1) for a purpose to be explained.

Pivotally mounted on a cross pin 36 carried by the side members 23 of the skid frame are a pair of links 37 symmetrically disposed with respect to the plane of the fore and aft axis of the frame 15, said links being shown as suitably spaced from each other and from the side members 23 by spacing sleeves 38. The opposite end of each link 37 is pivotally mounted on a pin 39, and a second pair of symmetrically disposed links 40 are pivoted on the pins 39 and, at their opposite extremities, on a transverse pin or stub shaft 41. Pin 41 in turn is carried by a pair of symmetrically disposed pivotal links 42 pivotally mounted at 43 on suitable lugs or posts 52 provided on a transverse member of the frame. Intermediate said links 42 on the pivot pin 41 is a sleeve 44 rotatably mounted thereon and having a piston rod 45 extending therefrom to a double acting piston reciprocatingly mounted in a cylinder 46 that in turn is pivoted at 47 on lugs 48 carried by the frame. A second pair of symmetrically disposed links 49 are also pivoted on the pins 39 between the links 37 and 40 and they in turn are pivoted on pins 50 mounted in up-standing lugs or posts 51 suitably provided on the frame.

A comparison of Figs. 1 and 2 will show that the links 37 and 49 constitute a toggle joint whose hinge point 39 is connected to a second toggle joint composed of links 40 and 42 whose hinge point 41 is connected to the piston rod 45, so that by actuation of the piston in cylinder 46 the toggles may be opened as shown in Fig. 1 to move the skid frame into its vertical position, in which position the hinge of toggle 40, 42 is moved past dead center before the hinge of toggle 37, 49 reaches dead center so that the skid frame is locked in its relatively vertical position, or said toggles may be closed as shown in Fig. 2 so as to move said skid frame around its pivot axis 20 into a substantially horizontal position resting on the frame 15. Cylinder 46 is also suitably connected by piping to the source of fluid pressure heretofore referred to, the connections including suitable control means in the cab 13 for admitting pressure fluid to one end or the other of the cylinder 46 so that the skid frame may be moved into its substantially vertical and horizontal positions.

A preferred type of container to be used, particularly when transporting concrete or the like, is shown in Figs. 1 and 2. As here illustrated the container 60 comprises a body portion which may be of circular, rectangular or any other suitable cross section, said body portion having at the bottom thereof a hopper-shaped extension 61 leading to an opening at 62 of any suitable shape and controlled by any suitable closure member 63. The upper end of the body portion 60 is

closed by any suitable member 64 that will permit ready filling of the container but when the container is lying on its side will prevent escape of material from the interior thereof. Container 60 is mounted on legs 65 which are preferably of suitable construction so as to be extensible, being shown as having telescopic members 66 slidable into and out of the main portion 65 thereof and locked in adjusted position in any suitable way. Thereby, by variously extending the portions 66 of the legs and locking the same in adjusted position, the opening 62 from the container may be disposed at the desired elevation above the surface of the ground.

Container 60 has exterior vertically extending frame members 67 so arranged and cross connected as to provide a structure which may slide in contact with the skid frame, and said vertically extending members 67 have at opposite sides, adjacent the top of the container, the complementary elements of pin and hook means for cooperation with the elements 27, here shown as rearwardly extending hooks 68 having depending portions 69 provided with rearwardly facing cam surfaces, said hooks being spaced transversely with respect to the container sufficiently to cooperate with the pins 27 on the extremities of cross arm 26. Said transverse members 67 are also provided with the complementary elements of pin and hook means for cooperation with the elements 35, here shown as laterally projecting pins 70 for cooperation with the hooks 35 heretofore referred to. The container 60 may if preferred be mounted in a rectangular framework of which the vertical members 67 constitute the forward corners, and comparable vertically extending members 71 form the corners at the rear face, said vertically extending members 67 and 71 being appropriately connected by suitable transverse members 72 and 73 connected by bracing 74 so that an adequately rigid frame for the container 60 is provided.

In operation, assuming that the container 60 is resting on its legs 65, 66 as shown in Fig. 1, and which legs may be suitably adjusted as before referred to so as to elevate the outlet from the container to the desired distance above the ground, said container may be filled with any suitable load, as aerated concrete, through the open top or through an opening in member 64. The truck may then be backed up against the container, as shown in Fig. 1, approximately aligning the container with the rear of the truck. In this position the skid frame is in a substantially vertical position and locked in this position by the action of the compound toggle composed of links 37, 49, 40, 42. The driver from his control in the cab may then admit fluid under pressure through the connection 33 and the hollow pivot at 29 to the piping 32 leading to the cylinder 30, whereupon the plunger and rod 31 will move upwardly with respect to the cylinder, the side members 25 of the extensible section of the skid frame sliding in the grooves provided in the side members 23, until the pins 27 are engaged with the hooks 68. If the pins 27 are not in exact alignment with the hooks 68 the rearwardly facing inclined surfaces of the depending portions 69 of said hooks will cam the pins into proper engagement with the hooks 68. Further upward movement of the plunger and rod 31, through engagement of the pins 27 with the hooks 68, will lift the container off of the ground, until the pins 70 engage the hooks 35, the forwardly facing inclined surfaces of the latter

carrying the pins into proper position if they are not in exact alignment. The container is now rigidly locked to the skid frame, the pressure being retained in the cylinder 30 to prevent movement of the extensible section with respect to the body of the skid frame. By operating the control in the cab the driver now admits pressure fluid to the rearward end of the cylinder 46 whereby the piston therein is moved to the left as viewed in Fig. 1, drawing piston rod 45 to the left, and through the operation of the compound toggle composed of links 37, 49, 40, 42, the skid frame with the container locked thereto is moved through approximately 90° about the pivot axis 20 until the container is laid on its side with the skid frame resting on the frame 15. During this movement and throughout the transportation of the container on the frame 15 the pressure is maintained in the cylinder 30 through the communication afforded by the hollow pivot pin 20, and therefore the container is retained in its locked position on the skid frame. In this position of transportation the center of gravity of the load provided by the container is well forward of the rear axle of the truck so that the load is in a position of stability.

Upon arrival at the place where the load is to be deposited, and more particularly when the invention is employed for transporting concrete, fluid pressure is admitted by the driver into the forward end of the cylinder 46, whereupon piston rod 45 moves to the right as viewed in Fig. 1, opening up the aforesaid compound toggle mechanism and swinging the skid frame with the container thereon through the desired angle. If the contained material is to be immediately delivered the member 63 may be opened for delivery of the contents of the container without depositing the container on the ground, after which the container may be returned to its original location for refilling. On the other hand, if the container is to be left at the point of delivery for a longer or shorter period, when the skid frame reaches its vertical position the control for the cylinder 30 can be opened whereupon gravity will force the pressure fluid out of the cylinder 30, whereby the container will first be lowered to engage its legs with the ground, after which the cross arm 26 will further descend until stopped by the upper extremity of the skid frame or by the plunger 31 reaching its lowermost position. Thereby the pin and hooks 27, 68 and 70, 35 are disconnected so that the truck may leave the container resting on the ground and go to any suitable location for picking up another load.

When handling air-entrained cement as before referred to it will be observed that the container 60 is filled while in a relatively vertical position, but it is turned over into a substantially horizontal position where it is retained during transportation and subject to the inertia effects of changes in speed of the vehicle, after which it is returned to substantially vertical position at the point of delivery so that the contents of the container are thereby moved twice into different positions and transported under conditions such as to minimize segregation of the contents.

While the embodiment of the invention so far described employs hydraulic mechanism in association with a skid frame for elevating and locking the container to the skid frame, the invention also contemplates other provisions for lifting the container with respect to the skid frame preliminarily to its rotation through an angle of approximately 90° for transportation in

substantially horizontal position. Thus, in place of using hydraulic mechanism associated with the skid frame itself, if the truck is provided with hydraulic jacks as heretofore referred to, such hydraulic jacks may be used for effecting the elevation and locking of the container.

This is illustrated in Fig. 5 wherein parts common to this embodiment and the embodiment of Figs. 1 to 4 are designated by like reference characters. In the construction as here shown the frame 15 or the main frame of the chassis has mounted thereon at each lateral extremity thereof adjacent to the rear of the vehicle a hydraulic jack cylinder 75 provided with a plunger 76 terminating in a foot piece 77. Said hydraulic cylinders 75 are suitably connected through piping not shown with the hydraulic mechanism heretofore described with suitable control means in the cab of the vehicle. When such hydraulic jacks are used in conjunction with the embodiment of the invention shown in Figs. 1 to 4 they may be actuated from the control mechanism in the cab to extend the foot pieces 77 into contact with the ground and thereby prevent tilting of the truck chassis while elevating or lowering the container and moving the same into or out of its position for transportation. However, if the jack plungers are of sufficient length they may be further extended from the cylinders by hydraulic pressure so as to lift the rear of the vehicle off of the ground and thereby take the place of the hydraulic mechanism operating an extensible section of the skid frame.

In the embodiment of Fig. 5 the hooks 78, corresponding to the hooks 34 in Figs. 1 to 4, are disposed below the pins 70 and face upwardly. The pins 27 and hooks 68 are spaced by the same distance as the pins 70 and hooks 78, so that when the rear of the truck is raised by the hydraulic jacks the hooks 78 and pins 27 will simultaneously pick up the pins 70 and hooks 68, respectively, and as these hooks are facing in opposite directions, the container will be interlocked with the skid frame so as to prevent disconnection therefrom. With the rear of the truck still held off of the ground by the hydraulic jacks the cylinder 46 may be actuated as heretofore described to move the container from its vertical to its horizontal position, after which the pressure in the hydraulic jacks may be released to permit return of the rear wheels to the ground. The container may now be transported to any suitable location as heretofore pointed out where the container can be returned to its vertical position either for emptying or by use of the jacks for deposit on the ground.

It will therefore be perceived that the present invention provides a simple but highly effective means for transporting relatively heavy loads which may first be lifted off the ground and then swung through approximately 90° to a position of stability on the truck where the load is locked against displacement with respect thereto. This construction is of particular utility in the transportation of aerated concrete because the aforesaid dispositions of the container minimize segregation of the constituents. The invention thereby facilitates the mixing of the concrete at desired central points and its transportation to desired places of use, with or without leaving the container at the latter points, as storage containers, so that the vehicle is not immobilized while the concrete is being used and it is not necessary for the concrete mixing unit to go to the place where the concrete is to be used. At

the same time the construction is strong and rugged, composed of simply fabricated parts that are easy to assemble and service, and provides a readily operated and highly efficient means for picking up, transporting and depositing relatively heavy loads, and particularly air-entrained concrete.

While the embodiments of the invention illustrated on the drawings have been described with considerable particularity it is to be expressly understood that the invention is not limited thereto as the same is capable of receiving a variety of expressions some of which will now readily suggest themselves to those skilled in the art, while certain features may be used without other features. As the particular mechanisms for developing fluid pressure and their controls constitute no part of the present invention they have been omitted from the illustrations, but it is to be expressly understood that any suitable mechanisms of this character may be used. Furthermore, while hydraulic mechanism is at present preferred the invention as applied to certain uses may employ suitable air or cable mechanism in place of the hydraulic mechanism. Changes may also be made in the details of construction of the component parts and in the arrangement, size and proportion of the parts, other forms of containers may be used with the rig mounted on the vehicle, etc. Reference is therefore to be had to the appended claims for a definition of the invention.

What is claimed is:

1. In transporting equipment, in combination with a container adapted to rest on the ground, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame, means operatively connected to said base and skid frames for moving the skid frame between a substantially vertical and a substantially horizontal position, spaced pairs of complementary locking elements mounted respectively on and engageable by relative vertical movement between said container and said skid frame, and fluid pressure means associated with said skid frame and operable when said skid frame is in its relatively vertical position to move said skid frame vertically and thus to engage the complementary locking elements on said container and skid frame for movement of said skid frame and container together as said skid frame is moved by said first named means into its relatively horizontal position.

2. In transporting equipment, in combination with a container adapted to rest on the ground, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame, means operatively connected to said base and skid frames for moving the skid frame between a substantially vertical and a substantially horizontal position, spaced pairs of complementary locking elements mounted respectively on and engageable by relative vertical movement between said container and said skid frame, and fluid pressure means associated with said skid frame and operable when said skid frame is in its relatively vertical position to move said skid frame vertically and thus to engage the complementary locking elements on said container and skid frame for movement of said skid frame and container together as said skid frame is moved by said first named means into its relatively horizontal position. said connection between said first named

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means and said skid frame including a compound toggle mechanism constructed to lock said skid frame in its relatively vertical position.

3. In transporting equipment, in combination with a container adapted to rest on the ground, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame, means operatively connected to said base and skid frames for moving the skid frame between a substantially vertical and a substantially horizontal position, spaced pairs of complementary locking elements mounted respectively on said container and said skid frame, and fluid pressure means associated with said skid frame and operable when said skid frame is in its relatively vertical position to engage the complementary locking elements on said container and skid frame for movement of said skid frame and container together as said skid frame is moved by said first named means into its relatively horizontal position, said fluid pressure means including hydraulic jacks operable by reaction with the ground to lift the skid frame and engage the complementary locking elements on said container and skid frame.

4. In transporting equipment, in combination with a container adapted to rest on the ground, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame, means operatively connected to said base and skid frames for moving the skid frame between a substantially vertical and a substantially horizontal position, spaced pairs of complementary locking elements mounted respectively on and engageable by relative vertical movement between said container and said skid frame, and fluid pressure means associated with said skid frame and operable when said skid frame is in its relatively vertical position to move said skid frame vertically and thus to engage the complementary locking elements on said container and skid frame for movement of said skid frame and container together as said skid frame is moved by said first named means into its relatively horizontal position, said fluid pressure means being mounted on said skid frame and said skid frame including a movable section operated by said last named fluid pressure means for engaging the complementary locking elements on said container and skid frame.

5. In transporting equipment, in combination with a container adapted to rest on the ground, a base frame adapted to be mounted on a vehicle chassis, a skid frame pivotally mounted on said base frame, said skid frame including an extensible section, fluid pressure means operatively connected to said base and skid frames for rotating the skid frame between a substantially vertical position and a substantially horizontal position, a pair of complementary locking elements carried by said extensible section and by said container adjacent the top of the latter, a second pair of complementary locking elements respectively carried by the body of said skid frame and a lower portion of said container, and fluid pressure means mounted on said skid frame for moving said extensible section to engage said first named locking elements and thereafter elevate said container to engage said second named locking elements to interlock said container on said skid frame for movement therewith about said pivotal axis.

6. In transporting equipment, in combination with a container adapted to rest on the ground, a

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base frame adapted to be mounted on a vehicle chassis, a skid frame pivotally mounted on said base frame, said skid frame including an extensible section, fluid pressure means operatively connected to said base and skid frames for rotating the skid frame between a substantially vertical position and a substantially horizontal position, a pair of complementary locking elements carried by said extensible section and by said container adjacent the top of the latter, a second pair of complementary locking elements respectively carried by the body of said skid frame and a lower portion of said container, and fluid pressure means mounted on said skid frame for moving said extensible section to engage said first named locking elements and thereafter elevate said container to engage said second named locking elements to interlock said container on said skid frame for movement therewith about said pivotal axis, the connection between said first named fluid pressure means and said skid frame including a compound toggle mechanism operative to lock the skid frame in its relatively vertical position.

7. In transporting equipment, in combination with a container adapted to rest on the ground, a base frame adapted to be mounted on a vehicle chassis, a skid frame pivotally mounted on said base frame, said skid frame including an extensible section, fluid pressure means operatively connected to said base and skid frames for rotating the skid frame between a substantially vertical position and a substantially horizontal position, a pair of complementary locking elements carried by said extensible section and by said container adjacent the top of the latter, a second pair of complementary locking elements respectively carried by the body of said skid frame and a lower portion of said container, and fluid pressure means mounted on said skid frame for moving said extensible section to engage said first named locking elements and thereafter elevate said container to engage said second named locking elements to interlock said container on said skid frame for movement therewith about said pivotal axis, said second named fluid pressure means having a fluid pressure connection carried by said skid frame and including a hollow pivotal member therefor whereby said fluid pressure means is operable in all positions of pivotal movement of said skid frame to retain said container interlocked with said skid frame.

8. In transporting equipment, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame, fluid pressure means operatively connected to said base and skid frames for moving the skid frame between a substantially vertical position and a substantially horizontal position, said skid frame carrying means adjacent its upper end for interlocking and lifting engagement with a container, and a fluid pressure means associated with said skid frame for lifting the same when in a relatively vertical position to engage and lift said container, said first named fluid pressure means being operable to rotate said skid frame with the container thereon from its relatively vertical position to a position in which said skid frame rests on said base frame.

9. In transporting equipment, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame, fluid pressure means operatively connected to said base and skid frames for moving the skid frame between a substantially verti-

cal position and a substantially horizontal position, said skid frame carrying means adjacent its upper end for interlocking and lifting engagement with a container, and a fluid pressure means associated with said skid frame for lifting the same when in relatively vertical position to engage and lift said container, said first named fluid pressure means being operable to rotate said skid frame with the container thereon from its relatively vertical position to a position in which said skid frame rests on said base frame, the operative connection between said first named fluid pressure means and said skid frame including a compound toggle mechanism operable to lock said skid frame in its substantially vertical position.

10. In transporting equipment, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame, fluid pressure means operatively connected to said base and skid frames for moving the skid frame between a substantially vertical position and a substantially horizontal position, said skid frame having means carried thereby for engaging and lifting a container, and a fluid pressure means associated with said skid frame for lifting the same when in relatively vertical position to engage and lift a container, said first named fluid pressure means being operable to rotate said skid frame with the container thereon from its relatively vertical position to a position in which said skid frame rests on said base frame and said second named fluid pressure means including hydraulic jacks engageable with the ground and operable to raise said skid frame by raising the rear end of the vehicle chassis.

11. In transporting equipment, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame, fluid pressure means operatively connected to said base and skid frames for moving the skid frame between a substantially vertical position and a substantially horizontal position, said skid frame carrying means adjacent its upper end for interlocking and lifting engagement with a container, and a fluid pressure means associated with said skid frame for lifting the same when in relatively vertical position to engage and lift said container, said first named fluid pressure means being operable to rotate said skid frame with the container thereon from its relatively vertical position to a position in which said skid frame rests on said base frame and said second named fluid pressure means being mounted on said skid frame and having means operable thereby for actuating said engaging and lifting means.

12. In transporting equipment, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame and including an extensible section slidably mounted thereon, fluid pressure means operatively connected to said base and skid frames for rotating the skid frame between a substantially vertical and a substantially horizontal position, and fluid pressure means mounted on said skid frame and operatively connected to said extensible section for raising and lowering the same with respect to the body of said skid frame, said extensible section and the body of said skid frame each having lifting means there-

on and said lifting means being relatively separable for locking engagement with a container upon extension movement of said section relative to said body.

13. In transporting equipment, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame and including an extensible section slidably mounted thereon, fluid pressure means operatively connected to said base and skid frames for rotating the skid frame between a substantially vertical and a substantially horizontal position, and fluid pressure means mounted on said skid frame and operatively connected to said extensible section for raising and lowering the same with respect to the body of said skid frame, said extensible section and the body of said skid frame having means thereon operable to engage and lift a container and said second named fluid pressure means having fluid pressure connections carried by said skid frame and including a hollow pivot thereon so that pressure can be maintained on said second named fluid pressure means in all positions of pivotal movement of said skid frame.

14. In transporting equipment, a rig adapted to be mounted on a vehicle chassis and including a base frame, a skid frame pivotally mounted on said base frame and including an extensible section slidably mounted thereon, fluid pressure means operatively connected to said base and skid frames for rotating the skid frame between a substantially vertical and a substantially horizontal position, and fluid pressure means mounted on said skid frame and operatively connected to said extensible section for raising and lowering the same with respect to the body of said skid frame, said extensible section and the body of said skid frame having means thereon operable to engage and lift a container and said operative connections between said first named fluid pressure means and said skid frame including a compound toggle mechanism operable to lock said skid frame in its relatively vertical position.

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