

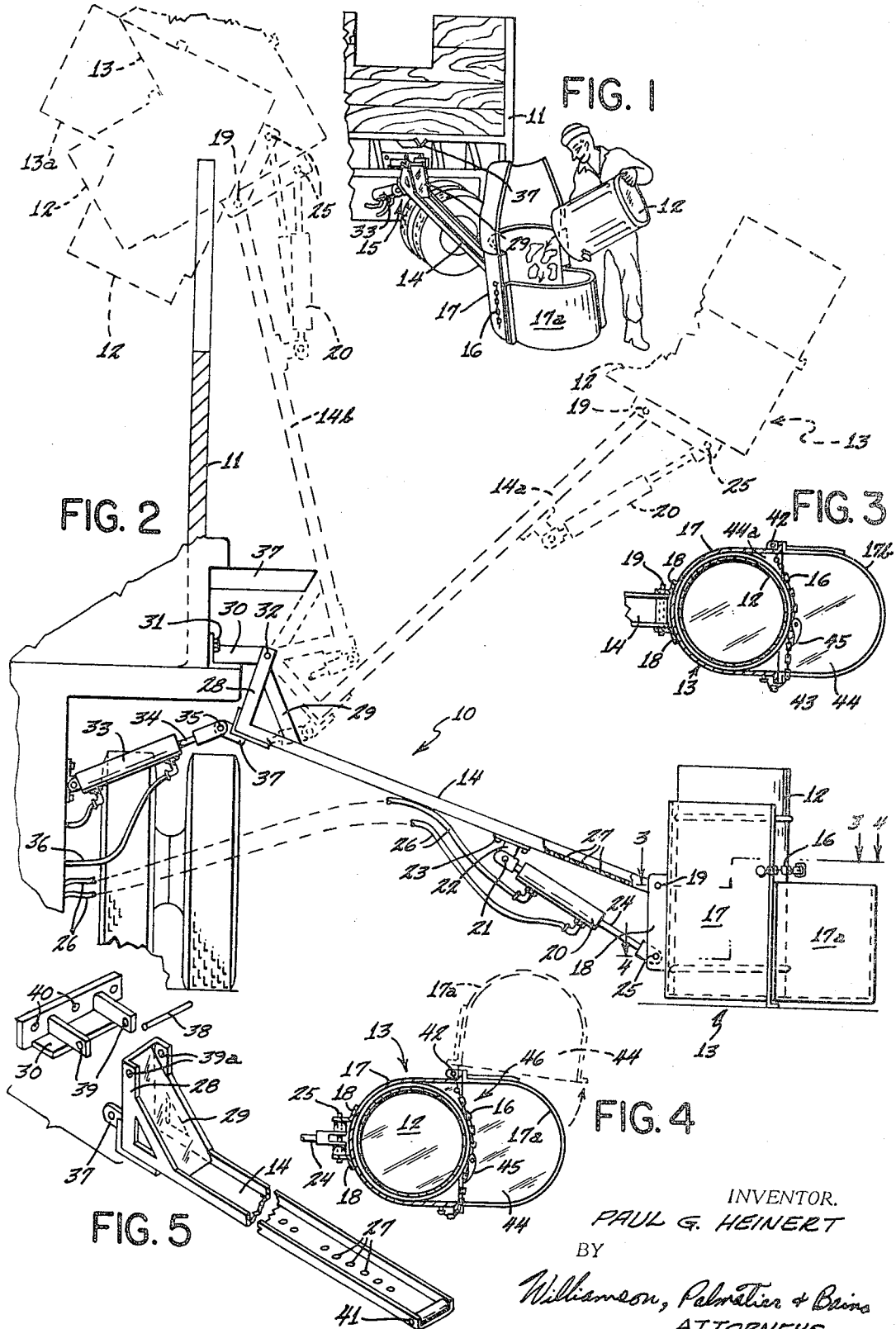
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LOADING DEVICE

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3,446,377

LOADING DEVICE

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ABSTRACT OF THE DISCLOSURE

A refuse loading device attached to a truck body for receiving refuse at ground level and for elevating and depositing the same into the truck body. The device employs a lifting boom pivoted at its inner end to the truck at a point well above ground level and normally positioned in outstanding relation to the body of the truck with its outer end near ground level. The boom is powered, preferably hydraulically, and under control, to elevate a refuse receptacle supported at the outer end thereof into an elevated position with the outer end of the boom disposed close to the upper edge of the truck body. Mechanism is provided for controllably shifting the refuse receptacle downwardly into a substantially inverted position when the boom is swung to said elevated position.

This invention relates to a loading device and more particularly relates to a side arm loading device adapted to be attached to a truck for loading refuse into the truck.

In collecting refuse, typically, at least two men are necessary. This is so because the refuse containers generally become rather full in the period between collections and two men are necessary to hoist the container over the truck sides for dumping. Several devices for loading a refuse truck have been developed. The primary purpose of a loading device is the elimination of one of the two men needed, and the attendant labor cost. However, the loading devices presently available are not sufficiently flexible in that the full range of loading problems are not considered. For example, a loading device should have provision to receive refuse directly into the device for deposit into the truck. Also, the loading device should be capable of receiving a refuse container of any reasonable size for direct unloading into the truck without first unloading the container into the loading device for subsequent unloading into the truck.

Further, the loading device, in order to include the full range of usages, must have provision to receive refuse which is dumped into the lifting device for deposit in the truck. Of particular importance is the feature which allows the operator to simply roll a refuse container into the loading device without regard for the relative height of the refuse container relative to the truck and attached loading device.

With these comments in mind, it is to the elimination of these and other disadvantages to which the present invention is directed, along with the inclusion therein of other novel and desirable features.

An object of my invention is to provide a new and improved loading device of simple and inexpensive construction and operation. Another object of my invention is to provide a novel, loading device which will receive refuse whether by receiving a refuse container therein, or by direct discharge of the refuse into the loading device for subsequent deposit in the truck.

Still another object of my invention is the provision of an improved and novel loading device which completely unloads refuse from the refuse receptacle or refuse container attached to it rather than to the receptacle into the truck.

A further object of my invention is the provision of an improved loading device which loads refuse into a truck

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and which is extremely simple in its assembly and will therefore permit quick and easy attachment to a truck and operation by a person with minimum skill or manual dexterity.

A still further object of my invention is the provision of a loading device which will receive refuse or a refuse container therein regardless of the elevation of the refuse or refuse container relative to the elevation of the truck into which the refuse will be unloaded.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts of the several views, and in which:

FIG. 1 is a diagrammatic sketch showing a typical usage of my loading device;

FIG. 2 is a rear view of my loading device attached to a truck and including in dotted line views showing on loading utilizing my device;

FIG. 3 is a sectional view taken along section line 3—3 of FIG. 2;

FIG. 4 is a plan view of the refuse receiving receptacle of my invention with a dotted line view showing a portion of the receptacle opened to permit receiving of refuse containers in the refuse receptacle taken at line 4—4 of FIG. 2; and

FIG. 5 is a perspective view showing the attachment of the side arm member of my device to a truck.

One form of the present invention is shown in the drawings and is described herein.

Referring to FIG. 1, my device, indicated in general by numeral 10, is shown attached to refuse truck 11. An operator is shown emptying a refuse container 12 into the refuse receiving receptacle 13 of my invention. Receptacle 13 is shown attached to lifting arm member 14. The attachment means between the arm 14 and receptacle 13 is not shown. The arm 14 is attached to truck 11 by the connection shown, in general, at 15.

Referring to FIG. 2, my device is shown in the solid line, in position to receive a refuse container therein. The refuse container is indicated by the numeral 12 and is secured in receptacle 13 by chain 16. It should be noted that refuse may be deposited directly into receptacle 13 for direct discharge into truck 11 or the refuse may be deposited first into a container 12, which container may then be secured in receptacle 13 for subsequent discharge. Further, the size of receptacle 13 should be sufficiently large to accommodate widely varying sizes of containers such as the container 12 shown secured in receptacle 13. Receptacle 13 is generally annular and comprises a pair of arcuate segments 17 and 17a. Arcuate section or segment 17a is hingedly attached to arcuate section or segment 17 about a substantially vertical hinged line to permit rotational movement of section 17a to provide an opening into which container 12 may be positioned.

Lifting arm member 14 is attached to receptacle arcuate section 17 utilizing bracket 18 which is securely affixed to segment 17 of receptacle 13. Lifting arm member 14 is adapted to rotate about pivot 19 which is substantially horizontal and disposed in line with the direction of travel of truck 11. It should be noted that my receptacle 13 is constructed of a rigid material such as galvanized steel in that it must withstand a high degree of abuse during the loading and unloading operations. Arm 14 is typically a rigid channel iron, commercially available, and bracket 18 may be constructed of a pair of angles affixed to section 17 of receptacle 13 as by welding.

A commercially available hydraulic cylinder 20 is shown pivotally attached to lifting arm member 14 at pivot 21. Bracket 22 receives pivot 21 and is attached

to arm member 14 by bolt assemblies 23. The ram 24 of cylinder 20 is pivotally attached to bracket 18 at pivot 25. A pair of hydraulic lines 26 connect cylinder 20 to a hydraulic motor which is not shown here. It should be noted that bracket 23 is adjustable in that bolt assemblies 23 may be received into any pair of apertures 27 in arm member 14. This adjustment provides for changing the angle at which refuse receiving receptacle 13 rests and, correspondingly, the angle at which refuse receiving receptacle 13 discharges into truck 11. Pivot 19 and 25 may be made in any suitable manner, as by inserting a one-half inch bolt through a five-eighths inch piece of steel pipe and supplying bushings on each side to hold the pipe in place. The details of this connection are not shown in that any of several hinge or pivot means well known in the art may be utilized.

Lifting arm member 14, shown in FIG. 2, to which receptacle 13 is attached, is, in turn, attached to truck 11 at connection 15. Lifting arm member 14 is affixed to lever arm member 28 which is affixed to lifting arm member 14 as by welding and at substantially right angles thereto. A supporting gusset or bracket 29 is shown affixed to lifting arm 14 and lever arm 28 maintaining the relation between said arms in right angular relation. Truck mounting bracket 30 is attached to truck 11 by bolt assemblies 31. Bracket 30 extends outwardly from truck 11 providing a pivot point 32 adapted to receive lever arm member 28 for rotation about pivot 32 which is substantially horizontal and in line with the direction of travel of truck 11.

It will be obvious that the lifting arm 14 with the angled lever arm 28 constitutes an outstanding boom, which as will be later described, is controllably elevated, preferably by hydraulic mechanism, from a close to ground position at its outer end, to an upstanding, extreme elevated position.

Hydraulic cylinder 33 is attached, at one end, to truck 11 and the ram, at the other end of cylinder 33 and denoted by numeral 34, is pivotally attached to lever arm 28 at pivot 35, which is substantially at the intersection of arm member 14 and lever arm member 28. The cylinder 33 is attached to an hydraulic motor, which is not shown, utilizing hydraulic lines 36. Means controlling the flow of hydraulic fluid from the hydraulic motor to cylinders 33 and 20 is not shown since the control means is well known in the art, and is simply interposed in the hydraulic lines to each of the respective cylinders. Connection 15 is typically constructed of rigid steel stock which is commercially available and may take the typical shape of angle stock cut and welded to fit and form a rigid joinder of lever arm member 28 to lifting arm member 14.

A bracket 30 may be welded onto the joint formed by members 14 and 28 respectively, with an aperture therein adapted to receive cylinder 33 and form pivot point 35. Bracket 30 is also constructed of rigid steel stock, such as angle stock, with suitable apertures to receive pivot 32. Brake member 37 is shown attached to truck 11 and projecting outwardly therefrom. Lifting arm member 14, in the raised position indicated by the dotted lines, contact brake 37, abruptly stopping the movement of arm 14 in transmitting the abrupt motion to receptacle 13 disposed at the end of arm 14. This jerking action tends to shake loose any refuse in the receptacle or in a container attached in the receptacle. The brake is typically formed of an angle iron which is attached to truck 11 as by welding.

A detail of the connection of arm 14 to bracket 30 is shown in FIG. 5. Arm member 14 includes a plurality of apertures 27 adapted to receive an hydraulic cylinder 20 shown in FIG. 2. Lever arm member 28 is shown attached to arm member 14 and secured in right angular relation thereto by supporting bracket or gusset 29. Shaft 38 is inserted through apertures 39 in bracket 30 and apertures 39a in lever arm member 28 to form a pivot

point, indicated at numeral 32 in FIG. 2. Bracket 30 includes apertures 40 adapted to receive bolt assemblies 31 to secure bracket 30 to truck 11. Bracket 30 which extends outwardly from arm 14 and is typically welded thereto, is adapted to receive ram 34 of cylinder 33 for rotation about a substantially horizontal axis in line with the direction of travel of the truck 11. Means securing shaft 38 in apertures 39 and 39a respectively is not shown, although a conventional nut arrangement may be threaded at each end of shaft 38 to maintain position in apertures 39 and 39a. Arm member 14 is also shown with apertures 41 adapted to form the pivot point denoted as 19 in FIG. 2.

FIG. 3 shows the annular receptacle 13 of my loading device. Receptacle 13 is shown attached to lifting arm member 14 as pivot 19 formed by the attachment of the pair of brackets 18 which are welded to arcuate section or segment 17 of the receptacle 13. A refuse container 12 is shown secured in segment 17 by chain 16 which joins each side of segment 17 thereby securing container 12 therein. Arcuate segment 17b is hingedly attached to segment 17 along the hinged line 42 which is substantially upright when the receptacle 13 is positioned at the level on which the truck 11 rides. Segment 17b is secured to segment 17 as by a chain interconnecting each of the segments or sections, the chain denoted, in general, by numeral 43.

A platform 44 is shown at the bottom of section 17b and separate from platform 44a which is disposed at the bottom of section 17 and supports container 12. Referring to FIG. 4, the receptacle 13 is shown at the point of attachment to ram 24 at pivot 25. Bracket 18 is shown welded to section 17 of receptacle 13. A container 12 is shown secured in section 17 by chain 16 which is attached to each side of 17. A latch 45 draws chain 16 tightly about container 12. Arcuate section 17a is shown in dotted lines, pivoted outwardly from section 17 about hinge 42, thereby forming an opening, indicated at numeral 46, into which container 12 may be inserted to rest on platform 44a.

The operation of my loading device is described by referring to FIG. 2. As shown in the solid lines, a refuse container 12 is secured in receptacle 13 by tightly securing container 12 in arcuate 17 of receptacle 13, utilizing chain 16. The operator may then actuate the control mechanism, which is not shown, providing flow of hydraulic fluid to cylinder 33, thereby extending ram 34. As ram 34 extends, it acts upon lever arm member 28, pivoting lever arm member 28 about pivot 32 thereby raising lifting arm member 14 while maintaining the container 12 and receptacle 13 in a substantially upright position. It should be noted, of course, that container 12 may be eliminated from consideration in that the refuse may be readily discharged into receptacle 13.

As arm 14 is raised in response to the action of cylinder 33, it assumes a position, as shown in the dotted lines at 14a. This is an intermediate position, and in this position the receptacle 13 has not changed its position relative to member 14a. In the raised position, with side arm member 14b, receptacle 13 is in the position corresponding to its position in the solid lines of FIG. 2. To completely discharge the refuse from container 12, the operator may manipulate the controls to the hydraulic motor causing fluid to flow through cylinder 20 thereby extending ram 24 and pivoting receptacle 13 about pivot point 19, thereby forcing the receptacle 13 into the position indicated at 13a, thereby discharging the entire load within the container 12. In the raised position, arm member 14b contacts brake 37 allowing the operator to manipulate cylinder 33 causing arm 14b to be jolted against brake 37, thereby further emptying receptacle 13 in that the jolt caused by brake 37 on arm member 14b is transmitted to the receptacle 13, thereby shaking the receptacle to dislodge any remaining refuse.

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It should be noted that cylinder 20 and ram 24 may be replaced by a rigid member thereby eliminating the second cylinder and control means. Of course, the position of the receptacle 13 relative to arm member 14 is constant and, therefore, no means is provided to further increase the angle between receptacle 13 and arm member 14 when arm member 14 is raised to the position indicated at 14b in FIG. 2. However, the operator may manipulate cylinder 33 causing arm member 14b to contact brake 37 and thereby shake the receptacle 13 when it is in the raised position.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What is claimed is:

1. A loading device attached to a truck for receiving refuse at ground level and for elevating and depositing refuse in the truck body having in combination,
 - a lifting boom pivoted at its inner end to said truck at a point well above ground level and normally positioned in outstanding relation to the body of said truck with its outer end near ground level,
 - powered boom-actuating mechanism for controllably swinging said boom to an elevated position with its outer end disposed close to the upper edge of said truck body,

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a refuse receptacle shiftably supported from the outer portion of said boom and disposed in upright refuse-receiving position when said boom is lowered, mechanism for controllably shifting said receptacle downwardly into substantially inverted position over said truck body when said boom is swung to said elevated position, and said refuse receiving receptacle being generally annular and comprising a pair of hinged arcuate sections adapted to pivot about an upright axis to provide an opening adapted to receive refuse containing containers, said arcuate sections adapted to be secured forming said annular receptacle and wherein said receptacle includes means retaining said refuse containing container in said receptacle.

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