

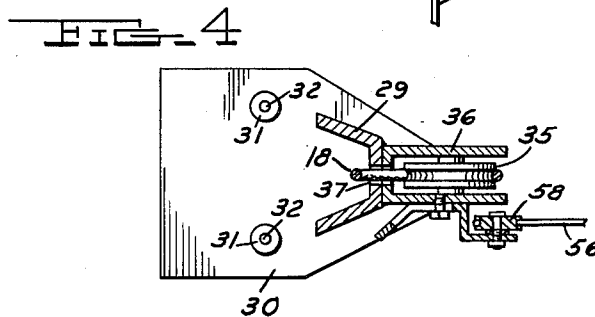
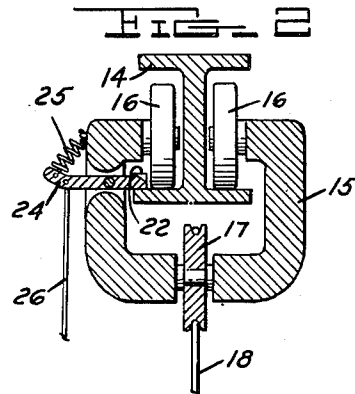
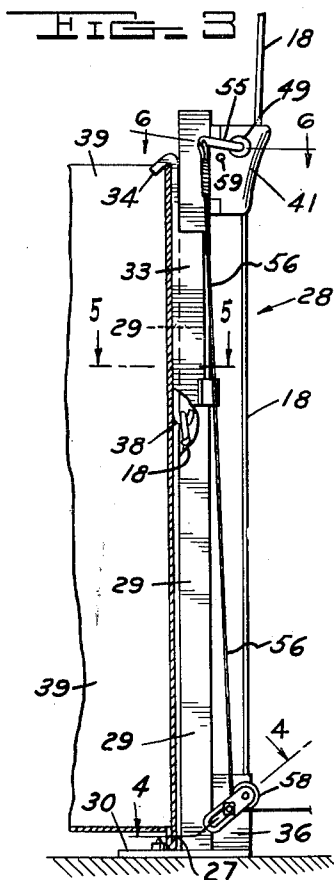
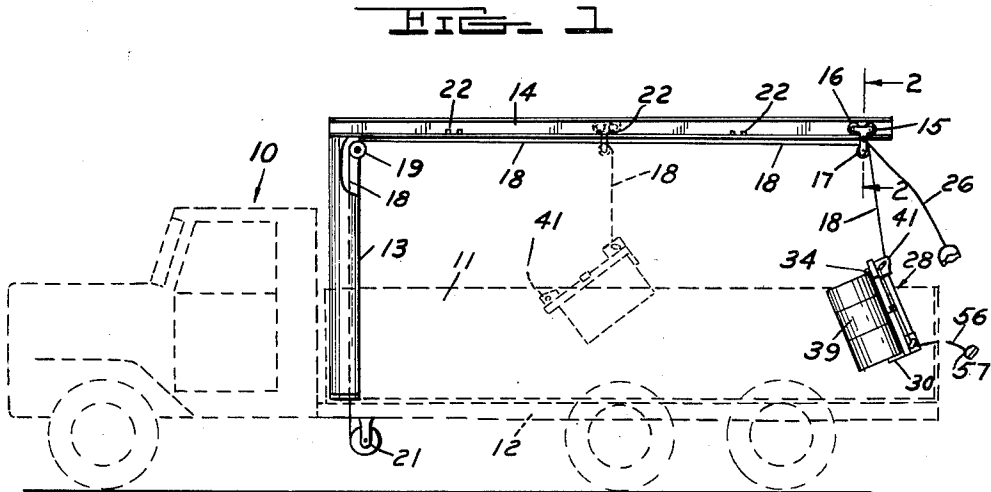
Feb. 24, 1953

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LOADING APPARATUS

2,629,506

Filed Oct. 5, 1949

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

FIG. 5

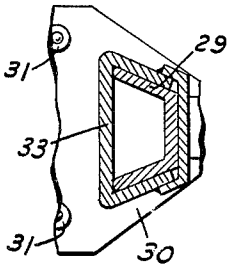


FIG. 8

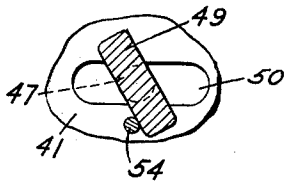


FIG. 9

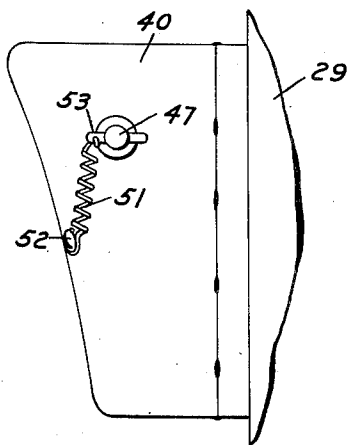


FIG. 6

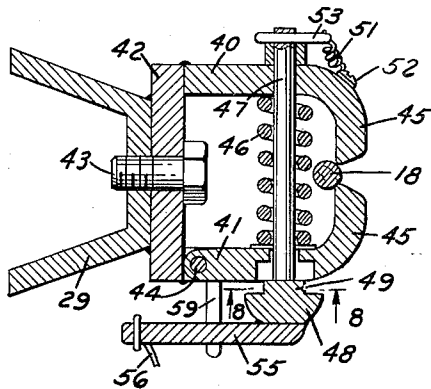
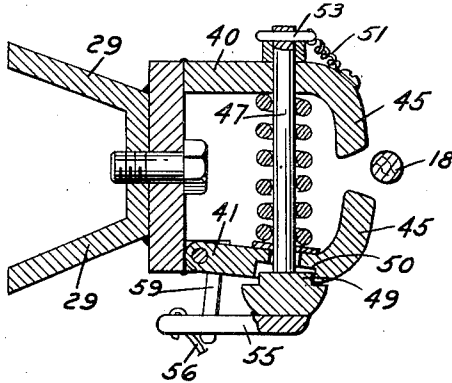


FIG. 7



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LOADING APPARATUS

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5 Claims. (Cl. 214—302)

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This invention relates to a loading apparatus and more particularly to a device for lifting and inverting rubbish containers for the purpose of discharging the contents thereof into the dump body of a vehicle.

It is an object of this invention to produce a loading apparatus for containers which is constructed simply and which enables rubbish containers positioned along opposite sides of an alleyway to be quickly and with a minimum of manual effort picked up and unloaded into the dump body of a vehicle driven down the center of the alley.

In the drawings:

Figure 1 is a side elevation of a vehicle equipped with the apparatus of this invention.

Figure 2 is a sectional view taken on lines 2—2 in Figure 1 and showing the locking arrangement on the roller carriage.

Figure 3 is a side elevation of the lifting clamp.

Figure 4 is a sectional view taken along the lines 4—4 in Figure 3.

Figure 5 is a sectional view taken along the lines 5—5 in Figure 3.

Figure 6 is a sectional view on lines 6—6 of Figure 3 showing the cable locking jaws in the closed position.

Figure 7 is a view similar to Figure 6 showing the jaws in the open position.

Figure 8 is a sectional view on lines 8—8 in Figure 6.

Figure 9 is an enlarged side elevation of the clamping jaws showing the side opposite to that shown in Figure 3.

Referring to the drawings, there is shown in Figure 1, a vehicle having a cab 10 at the front end thereof and a dump body 11 at the rear mounted on a chassis 12. An upright column 13 is mounted at the rear end of dump body 11. On the upper end of column 13 there is secured a boom 14, column 13 being rotatably supported on body 11 so that boom 14 is arranged to swing in a horizontal plane. Boom 14 is preferably of I-beam formation and is arranged to extend rearwardly to a point above the rear end of dump body 11.

A U-shaped carriage 15 is mounted for rolling movement along boom 14. Carriage 15 is equipped with rollers 16 which rest upon the upper face of the lower flange of the boom and with a pulley 17 at the lower end thereof which serves as a guide for a lifting cable 18. A second pulley 19 is fixedly mounted at the upper end of column 13. Cable 18 extends forwardly from pulley 17, around pulley 19, downwardly through column 13 and is wound upon a winch 21 which

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is mounted on chassis 12 below the lower end of column 13. Winch 21 is preferably driven from the vehicle engine by a power take-off (not shown) at the vehicle transmission and can be operated by means of controls either within the cab or at the winch as desired.

At several points along boom 14, there are affixed pairs of spaced stops 22. A lever 24 is pivoted on carriage 15 and biased by a spring 25 so that its inner end normally engages between a pair of stops 22 and thereby locks carriage 15 in a desired longitudinal position on boom 14. Lever 24 is arranged to be released from stops 22 by a manual pull cord 26 attached to its outer end which also serves as a means for pulling the carriage forwardly and rearwardly along boom 14.

The lifting device, which is raised and lowered by winch 21 and cable 18, is in the form of an upright clamp 28. Clamp 28 comprises a vertical leg 29, which is preferably channel or V-shaped, and has a foot member 30 at the lower end thereof on which the bottom edge of a cylindrical rubbish container 39 is adapted to be positioned. Foot 30 has mounted thereon a pair of dowels 31 for engagement with the peripheral flange 27 at the lower end of the container. Dowels 31 are provided with piercing points 32 which pierce the bottom wall of containers which are not fashioned with a peripheral flange at the lower end.

A slide member 33, which is slidably arranged for vertical movement on leg 29 has a downwardly curved hook portion 34 at the upper end thereof. At its lower end slide member 33 is connected, as at 38, with the free end of cable 18. A sheave 35 is journaled between the legs of a U-shaped bracket 36 which is attached to the lower end of leg 29. Cable 18 extends downwardly along leg 29, around sheave 35, through an opening 37 at the lower end of leg 29 and upwardly within the channel trough of leg 29 to slide member 33 to which it is connected.

At the upper end of leg 29 there is secured a pair of clamping jaws 40 and 41. Jaw 40 is fixed to a backing plate 42, which is secured to leg 29 as by bolt 43. Jaw 41 is pivotally attached to plate 42 as by a pin 44. Jaws 40 and 41 are formed at their outer ends with opposed hook portions 45 which, when the jaws are in the closed position, are arranged to enclose cable 18. In the closed position ends 45 of jaws 40 and 41 are spaced apart a distance slightly less than the diameter of cable 18 so that a slight opening of the jaws is sufficient to release the cable.

Jaw 41 is biased to the open position by a coil spring 46 which abuts at each end against the

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inner faces of the two jaws. A locking bolt 47 which passes through the jaws and spring 46 has a knob 48 at one end on the inner face of which is formed an inwardly projecting elongated lug or cam 49. Knob 48 is located at the end of locking bolt 47 adjacent jaw 41. On the outer face of jaw 41 an elongated recess 50 is formed which, when bolt 47 is properly actuated, is arranged to register with cam 49 and permit jaw 41 to spring outwardly to the open position under the influence of spring 46. Bolt 47 is normally biased to rotate to a position where lug 49 is out of registration with recess 50 by a spring 51 which is anchored at one end on jaw 40 as at 52 and at its other end spring 51 is connected to a pin 53 fixed to the end of bolt 47 opposite knob 48. As viewed in Figures 6 and 8, it will be observed that spring 51 tends to rotate bolt 47 in a clockwise direction. A stop 54 on jaw 41 engages lug 49 to limit the rotation of bolt 47 in this direction so that the lug is disposed in a generally crosswise position relative to recess 50.

Bolt 47 is arranged to be rotated in the opposite direction so as to bring lug 49 into registration with recess 50 by means of a lever 55 which is affixed to or formed integrally with knob 48. A cable 56 having a handle 57 is connected with the outer end of lever 55. Cable 56 extends downwardly from lever 55 around a pulley 58 on bracket 36 and is of sufficient length to permit lever 55 to be actuated, when clamp 28 is in the raised position above dump body 11, by an operator standing on the ground at the side of the vehicle. A pin 59 projecting outwardly from jaw 41 is arranged to limit the turning of lever 55 and bolt 47 to a position where lug 49 is in registration with recess 50.

In using the apparatus described for lifting rubbish containers and discharging the contents thereof into a dump truck, the vehicle can be driven down the center of the alley and boom 14 can be swung to either side so as to enable attachment of clamp 28 to the rubbish containers positioned along the opposite sides of the alley. To lift up a container, boom 14 is swung to one side so that clamp 28 is disposed adjacent the container to be picked up. The container is tilted slightly to permit foot 30 to be positioned beneath the container with dowels 31 engaged behind the peripheral flange 27 at the lower end of the drum. Cable 18 is unwound sufficiently to permit the hooked end 34 of slide 33 to be engaged over the upper end of the container and the cable is then reeled in on winch 21 to lift the container and clamp off the ground. It will be noted that hook 34 is pulled downwardly by cable 18 and serves to clamp the container firmly on foot 30. If the container does not have a bottom peripheral flange for engagement behind dowels 31 then piercing points 32 pierce the bottom wall of the container when hook 34 is clamped over the upper edge of the container wall and pulled downwardly by the lifting cable.

Before the container is elevated the operator inserts cable 18 between jaws 40 and 41 and presses jaw 41 inwardly to the closed position. As soon as lug 49 is disengaged from within slot 50, spring 51 serves to turn lock bolt 47 so that lug 49 is disposed crosswise of slot 50. The cable is thus locked between the jaws and when winch 21 is operated to wind up the cable, clamp 28 and container 39 are elevated in a slightly inclined position. After clamp 28 has been raised by cable 18 sufficiently to permit the lower end of the container to clear the upper edge of the dump

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body, boom 14 is swung to a position where the container is disposed above the dump body. The operator then grips handle 57 and pulls downwardly to rotate lever 55 and thereby pivot lug 49 into registration with slot 50. When the lug and the slot are thus aligned, spring 46 pivots jaw 41 outwardly so as to release cable 18. Since the upward pull of cable 18 on clamp 28 is at sheave 35 and offset from the center of gravity of the container, clamp 28 together with the container will fall to an inverted position as soon as cable 18 is released from jaws 40 and 41, as is shown by broken lines on Figure 1. After one portion of the dump body has been loaded in this manner, carriage 15 is moved along boom 14 to a position where lever 24 engages another set of stops 22. The dump truck can thereby be loaded progressively from one end to the other, and the lifting clamp enables this operation to be performed quickly and with a minimum of manual effort on the part of the operator.

It will be noted that column 13 and boom 14 are mounted directly on dump body 11. When dump body 11 is raised at its forward end to dump the load of rubbish, boom 14 and column 13 are elevated with it. Since winch 21 is mounted on chassis 12, the drive for the winch includes a clutch for disengaging the winch so as to permit cable 18 to freely unreel when the dump body is being raised.

Although column 13 and boom 14 are shown as mounted on dump body 11, it will be appreciated that the column and boom may be mounted directly on the chassis of the vehicle if desired.

I claim:

1. A device for lifting and inverting an open ended container, such as a rubbish drum, comprising a frame adapted for supporting said container in an upright position, a lifting member extending upwardly at one side of the frame from the lower end thereof, said frame being arranged to swing around said lifting member from an upright position to an inverted position, and means for releasably inter-engaging the upper end of said frame with a portion of said lifting member adjacent said frame when the frame is in said upright position, said lifting member comprising a cable and said inter-engaging means comprising a clamp member on said frame, said clamp member having a pair of jaws, one of which is movable relative to the other, said jaws in the closed position being arranged to enclose a portion of said cable adjacent said jaws, means biasing said jaws to the open position, and releasable means for locking said jaws in the closed position, whereby when said frame is in the elevated position and said releasable locking means are actuated to release said cable, said frame swings downwardly from said upright to said inverted position and the contents of said container are discharged.

2. A device for lifting and inverting an open ended container, such as a rubbish drum, comprising a frame adapted for supporting said container in an upright position, a lifting member extending upwardly at one side of the frame from the lower end thereof, said frame being arranged to swing around said lifting member from an upright position to an inverted position, and means for releasably inter-engaging the upper end of said frame with a portion of said lifting member adjacent said frame when the frame is in said upright position, said lifting member comprising a cable and said inter-engaging means

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comprising a clamp having a pair of jaws, one of which is movable relative to the other, spring means biasing said jaws apart to a position releasing said cable, one of said jaws having a non-circular opening therein, a shaft passing through said jaws and having a non-circular lug at one end which in the closed position of said jaws lies crosswise over said non-circular opening and in the open position is received by said non-circular opening to permit said jaws to shift to said spaced apart position, and means biasing said shaft to a position wherein said lug lies crosswise over said non-circular opening.

3. A device for lifting and inverting an open ended container, such as a rubbish drum, comprising a frame adapted for supporting said container in an upright position, a lifting member extending upwardly at one side of the frame from the lower end thereof and movable vertically of said frame, a vertically slidable clamp on said frame for hooking over the upper edge of the container to hold said container on said frame, said clamp being connected with said lifting member such that when the lifting member is pulled upwardly said clamp is pulled downwardly to engage over the upper edge of the container, said frame being arranged to swing around said lifting member from an upright position to an inverted position, and means for releasably inter-engaging the upper end of said frame with a portion of said lifting member adjacent said frame when the frame is in said upright position, said inter-engaging means comprising a clamp member at the upper end of said frame having separable jaws.

4. The combination set forth in claim 3 including manual control means extending from said inter-engaging means for actuating said inter-engaging means from a point remote from said frame.

5. A device for lifting and inverting an open

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ended container, such as a rubbish drum, comprising an upright support member having a vertical guideway thereon, a slide member in said guideway having means thereon for hooking over the upper edge of the container, means at the lower end of said upright member for supporting the lower end of the container, said upright member having a cable guiding means adjacent its upper and lower ends, a cable anchored on said slide member and extending downwardly through said lower guide means and upwardly through said upper guide means, said upper guide means being actuatable to release the cable from therein, and comprising a pair of relatively movable jaws which in the closed position enclose a portion of said cable adjacent said jaws, one of said jaws being pivotable on a vertical axis in a direction away from the other jaw to release said cable from between said jaws.

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