

April 16, 1963

J. S. DEMPSTER

3,085,704

FRONT END LOADER EQUIPMENT

Filed Oct. 12, 1960

3 Sheets-Sheet 1

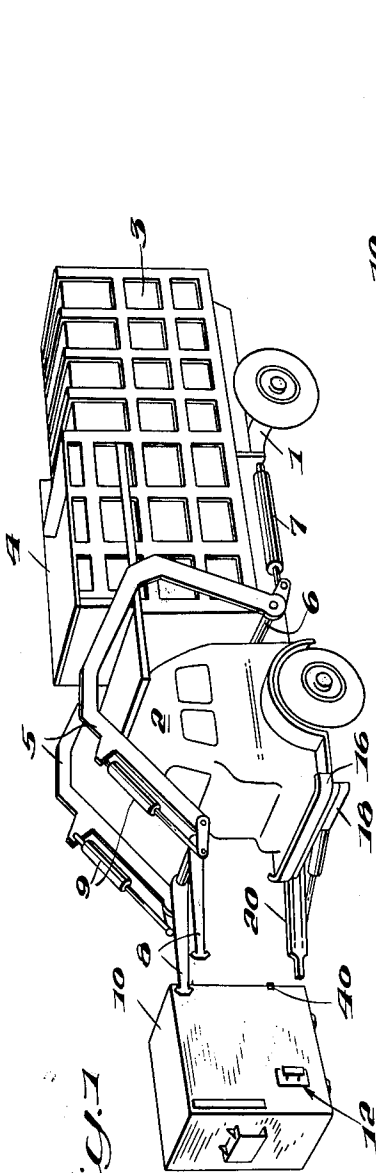


Fig. 1

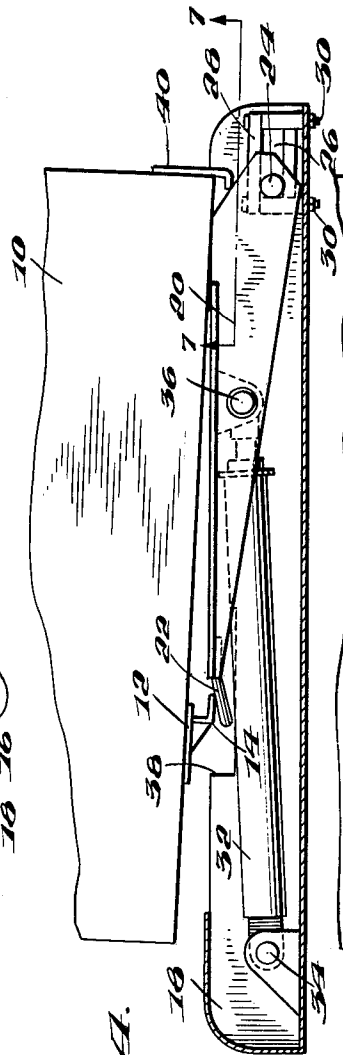


Fig. 4

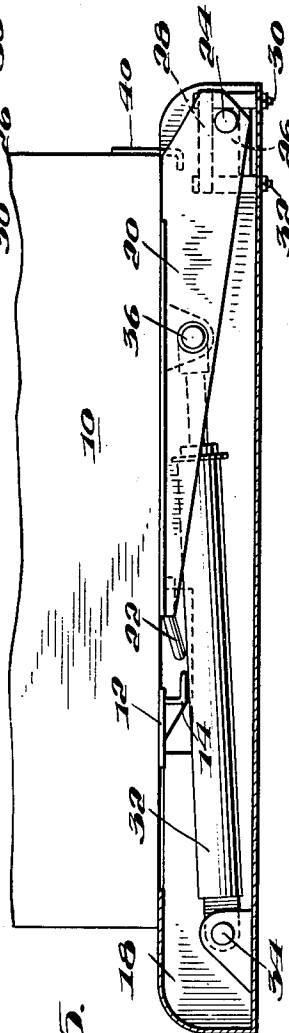


Fig. 5

INVENTOR
JOHN SAYLOR
DEMPSTER,

BY *Smucker & Mathis*

ATTORNEYS

April 16, 1963

J. S. DEMPSTER

3,085,704

FRONT END LOADER EQUIPMENT

Filed Oct. 12, 1960

3 Sheets-Sheet 2

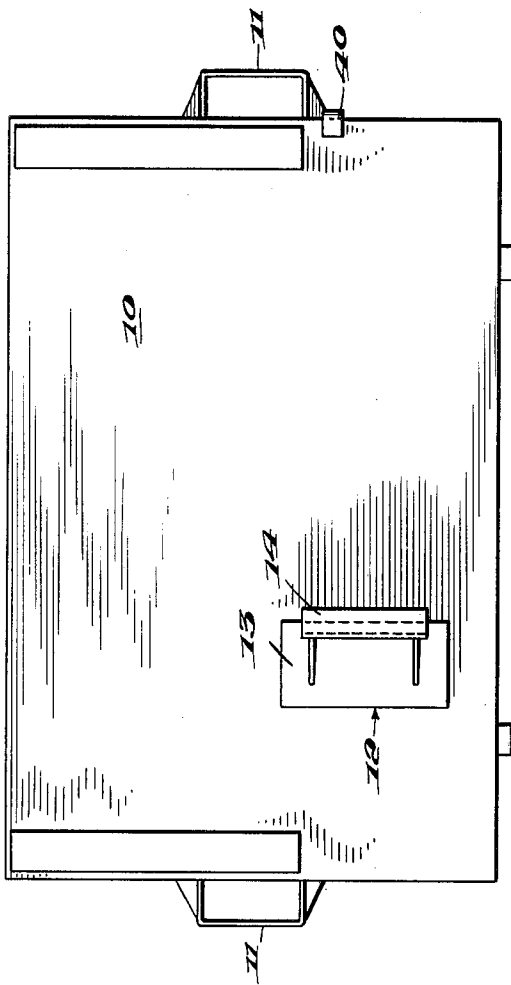


Fig. 2.

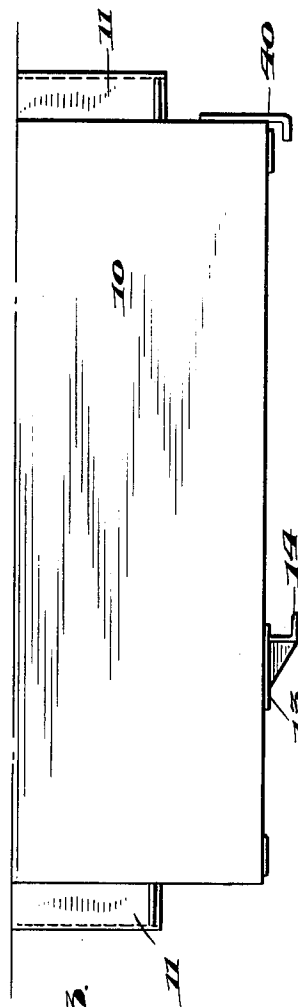


Fig. 3.

INVENTOR

JOHN SAYLOR DEMPSTER

BY

Shuck & Mathis

ATTORNEYS

April 16, 1963

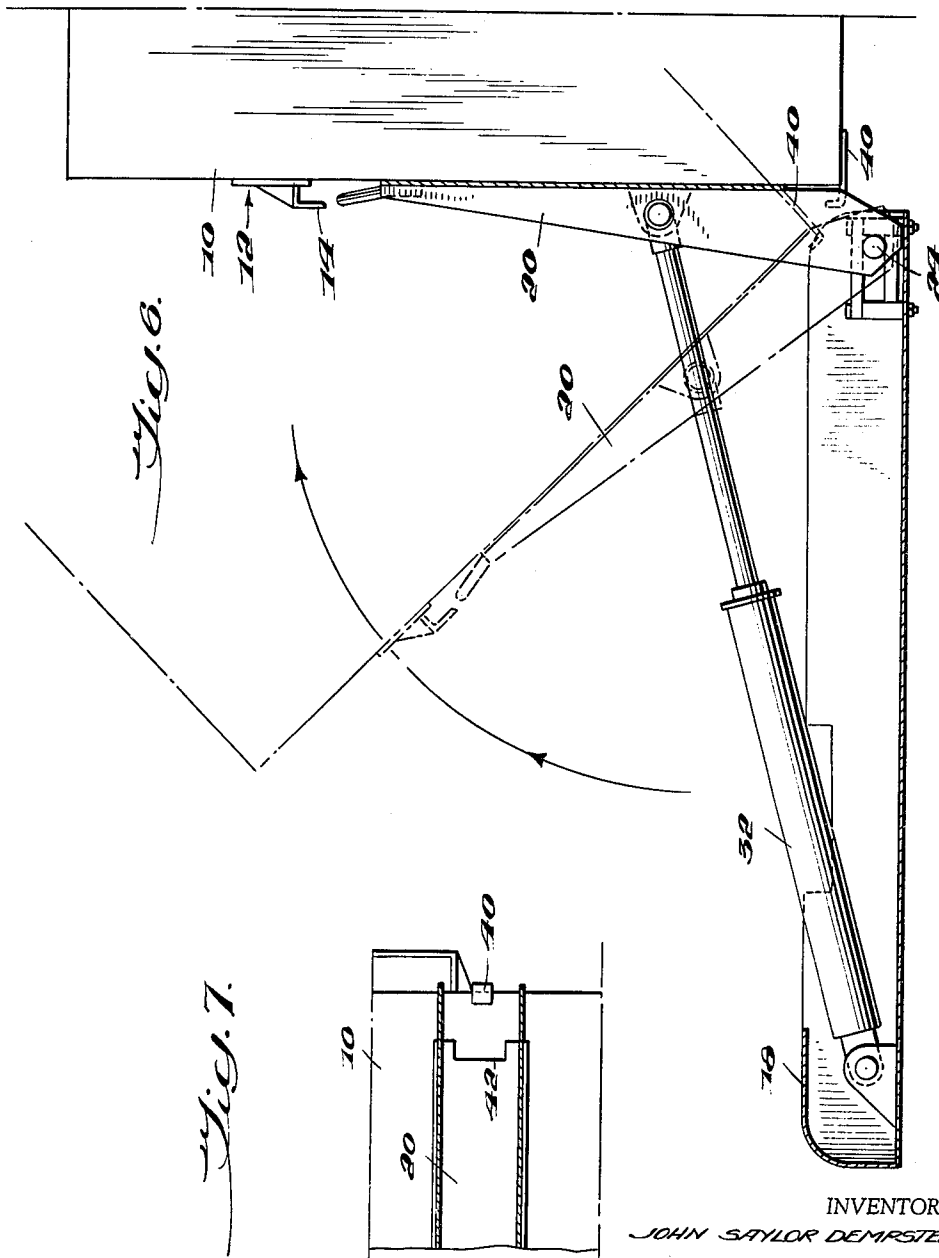
J. S. DEMPSTER

3,085,704

FRONT END LOADER EQUIPMENT

Filed Oct. 12, 1960

3 Sheets-Sheet 3



INVENTOR

JOHN SAYLOR DEMPSTER,

BY

Smucker & Mathis

ATTORNEYS

1

3,085,704

FRONT END LOADER EQUIPMENT

John Saylor Dempster, Knoxville, Tenn., assignor to Dempster Brothers, Inc., Knoxville, Tenn., a corporation of Tennessee

Filed Oct. 12, 1960, Ser. No. 62,164

5 Claims. (Cl. 214—302)

This invention relates to improvements in front end loader equipment and, more particularly, to the type used for dumping refuse from separate containers into the body of a motor vehicle.

As set forth in Patent No. 2,900,096, granted August 18, 1959, front end loader equipment, for picking up a container at the front of the vehicle was designed for the direct approach to the detachable container. In many installations, however, it is more convenient to place the container in such a location that the truck mounted hoisting unit cannot align itself for direct approach to the container. This occurs, for example, when the container is located in a narrow alley or where the movement of the vehicle to the container is limited by congested traffic.

One method of remedying the problem is that set forth in a prior application, Serial No. 857,819, filed December 7, 1959. A reach arm is mounted across the front of the vehicle. The arm is pivoted at one end so as to swing parallel to the ground about the pivot. A connector bracket is mounted in such a position on the container as to be engaged by the reach arm when the latter is fully extended. Thus, when the reach arm is retracted by means of a hydraulic cylinder, the container will be shifted to the proper pick-up position.

Although the reach arm operates satisfactorily to orient the container in front of the vehicle, it does not provide sufficient control of the container when returning it to its original position. As the arm extends, the container tends to slide outward along the arm so that when the arm is fully extended it may contact only one edge of the container. Thus, during the container return operation it may be necessary to move the vehicle forward and to move the arm back and forth to push the container to the desired location. This procedure is obviously damaging to the equipment and inefficient.

An object of this invention is to provide for the shifting or rotating of the container to its original position after the container has been emptied into the vehicle by the hoisting apparatus.

Another object of the invention is to improve the mechanism located on the vehicle carrying the front end loader equipment for the shifting or rotating of the container to its original position after dumping of the container by the loading equipment.

These objects may be accomplished, according to one embodiment of the invention, by providing a reach arm on the vehicle which may be operated in synchronism with the front end loader equipment and under the control of the operator thereof. This arm engages the container and rotates it with respect to the vehicle and into proper alignment with the front end loader equipment.

After the front end loader has dumped the contents of the container into the vehicle, the container will be returned to a position in front of the loader. A hook on the container is adapted to be engaged by the pick-up arm near the pivot. As the arm pivots to return the container to its original position, the hook locks the container to the arm and prevents it from sliding along the length of the arm.

This embodiment of the invention is illustrated in the accompanying drawings, in which:

FIG. 1 is a perspective view, showing front end loader equipment and a container in their approach relation to each other.

2

FIG. 2 is a side elevation view of a container.

FIG. 3 is a top plan view of a container.

FIG. 4 is a plan view of the reach arm assembly and a container, with parts in section, before engagement.

FIG. 5 is a plan view of the reach arm prior to return of the container.

FIG. 6 is a plan view showing the reach arm in intermediate and extended positions.

FIG. 7 is an elevational view of the container along lines 7—7 in FIG. 4.

Referring to FIG. 1, a motor vehicle chassis is designated generally by the numeral 1. The chassis 1 is power operated under the control of the operator, who is usually located within a cab 2, for controlling the movements of the vehicle and of the loader mechanism. A refuse body is shown at 3, mounted on the vehicle chassis 1 and having a hopper or opening 4 in the top thereof for the dumping of the refuse into the body.

The loader mechanism includes a pair of lifting arms 5 mounted on a torque tube 6 at the rear of the cab 2 for swinging movement to different angular positions with respect to the body 3. The lifting arms 5 may be operated by any suitable power means, such as a power cylinder 7, connected therewith.

Mounted on the front end portions of the lifting arms 5 are fork arms 8 capable of vertical swinging movements with respect to the lifting arms 5 under control of hydraulic power devices 9 that are connected therewith. The operation and function of these parts is described more fully in the aforesaid patent, No. 2,900,096.

A container is designated generally at 10. The container 10 is adapted to receive refuse and to confine the latter, having surrounding walls and a closed bottom and may be closed by lids at the top. Any suitable or desired form of container may be used, capable of being handled and dumped by the loader mechanism.

Referring to FIGS. 2 and 3, the container 10 is provided with sleeves 11 on opposite ends thereof in proper positions for horizontal alignment with the fork arms 8 when the lifting arms are lowered in their normal pick-up positions. The sleeves 11 are open at opposite ends, in order that the fork arms 8 may extend entirely through the sleeves and securely engage the container thereby, for lifting and dumping the container.

Mounted on a side wall of the container intermediate the sleeves 11, is a connector bracket 12. The bracket 12 comprises a mounting plate 13 welded or otherwise secured directly to one of the side walls of the container. An angular member 14 is secured to and extends outwardly from the mounting plate 13, so as to provide a shoulder or recess on said side wall of the container.

The vehicle chassis is usually provided with a bumper 16. The bumper is a convenient means of mounting the reach arm assembly.

The reach arm assembly comprises an elongated housing, generally indicated at 18, which extends lengthwise of the bumper 16 and is shown as directly beneath the latter. The reach arm is shown generally at 20. The outer end of the reach arm 20 is provided with a connecting finger 22 projecting therefrom in position to engage in the overhanging shoulder member 14 of the connector bracket 12 for shifting the container.

As shown in FIGS. 4 and 5 the reach arm 20 is mounted on a journal pin 24 which extends transversely through an elongated slot 26 and is connected at its opposite ends with the opposite sides of the reach arm 20. The slot 26 is provided within a bracket 28 which is secured to the inside of the housing 18 by bolts 30. The pin and slot 24—26 form a slidable pivot for the reach arm 20, which enables the reach arm to swing outwardly relative to the bumper 16 and also to shift lengthwise.

The movement of the reach arm is effected by a hydraulic cylinder 32 pivotally mounted at one end at 34 on the housing 18 within the closed end of the latter and extending therefrom to a pivot 36 on an intermediate portion of the reach arm 20.

The reach arm assembly is adapted to be used as a part of front end loader mechanism for picking up and dumping containers in locations where the container normally stands in an inaccessible position out of direct alignment for access thereto by the vehicle. For example, in localities such as congested traffic or narrow alleys, there may be insufficient area available for the truck mounted dumping unit to align itself for direct approach to the container. In that event, the vehicle may approach in the direction of the length of the container, as shown in FIG. 1, at a right angle to the normal approach side of the container. This requires that the container be turned through approximately ninety degrees to permit engagement of the front end loader mechanism for lifting and dumping the container.

The lifting arms 5 are initially raised to a position out of the way of the container. Then, the vehicle is moved forward in such relation that the reach arm 20 will engage with the connector bracket 12. As soon as the finger 22 on the reach arm 20 has engaged behind the angle bar 14 of the bracket 12, the container 10 can be turned from the angular position shown in FIG. 1 to a position where it will be disposed directly in front of the vehicle, as shown in FIG. 5. This is accomplished by the operation of the hydraulic cylinder 32, the contracting movement of which swings the reach arm 20 from the position shown in FIG. 1 to the position shown in FIG. 5. This actuation of the reach arm 20 moves the container 10 bodily on the ground with respect to the vehicle and slides it into abutting relation with the front portion of the vehicle against the forward faces of the reach arm 20 and of the housing 18 and properly centered with respect to the vehicle chassis.

The initial closing movement of the reach arm pulls the bracket 12 into the confines of the housing 18. A notch 38 is provided in front portion of the housing 18 to accommodate and receive bracket 12 during this closing movement.

Thereafter, the finger 22 can be disengaged from the bracket 12 by a short extending movement of the cylinder 32, sufficient to slide the pivot pin 24 to the opposite end of the slot 26 from the position shown in FIG. 4 to the position shown in FIG. 5.

The reach arm is then disengaged from the container and the vehicle may be backed off away from the latter, so as to move the lifting arms 5 and fork arms 8 into pick-up relation with the container. After such movement, the vehicle can be moved forward again to engage the fork arms 8 and the sleeves 11 for moving the container vertically to dump the contents therefrom into the hopper or opening of the body 3. Thereafter, the container can be set down on the ground by lifting arms 5 and fork arms 8. The operation and advantages of the reach arm assembly are more fully explained in the above-mentioned prior application.

The improvement which is the subject of this invention concerns the apparatus for returning the container to the side position illustrated in FIG. 1. As previously stated, after the container has been emptied into the body of the vehicle it is returned to the position shown in FIG. 4. A return position hook 40 is affixed to a side to the container, as shown in FIGS. 2 and 3. Referring to FIG. 7, the reach arm 20 is provided with a notch 42 which will engage the hook 40.

If it is desired to return the container 10 to the side position illustrated in FIG. 1, a short extending movement of the cylinder 32 is made to slide the pivot pin 24 from the position shown in FIG. 4 to that shown in FIG. 5. This movement will cause the notch 42 in the reach

arm 20 to be positioned adjacent to the hook 40 of the container.

As extension of the cylinder 32 continues, the reach arm will pivot about pin 24 and push the container 10 along the ground to the side position. This movement is shown in FIG. 6. During the initial movement of the arm, the container will slide relative to the arm 20 and the hook 40 will engage notch 42, thereby preventing further relative movement between the container and arm. When the desired position is reached, contraction of the hydraulic cylinder 32 will cause the reach arm 20 to rotate back into the housing 18. This movement will cause the notch 42 to be disengaged from the hook 40.

The hook prevents the container from sliding along the face of the reach arm 20 as it is being pushed to the side. Thus, the hook permits the container to be readily positioned at the desired location.

While the invention has been illustrated and described in one embodiment, it is recognized that variations and changes may be made therein without departing from the invention as set forth in the claims.

I claim:

1. A container transporting device comprising in combination, a container and a reach arm assembly, said container having a side wall, opposite end walls, a first corner at the intersection of an end wall and the side wall, a second corner at the intersection of the opposite end wall and said side wall, and a bracket secured to the side wall adjacent the first corner and remote from the second corner, said bracket having a portion spaced away from the side wall and extending therealong to form a pocket having its opening toward the second corner and a hook on the container adjacent the second corner and having an end portion extending along and spaced from said side wall, said reach arm assembly having a base, a reach arm pivotally mounted on said base, operating means to swing the reach arm away from the base, said bracket and said hook being arranged in position to be engaged selectively by the reach arm upon the substantially horizontal movement of the reach arm relative to the side wall, said reach arm being adapted to move into abutting relation with the side wall without engaging the bracket and the hook, whereby the reach arm selectively moves the container inwardly and outwardly relative to the base.

2. A container transporting device on a vehicle comprising in combination, a container and a reach arm assembly, said container having a body portion including side and end walls with a corner at the junction of the side and end walls, a hook affixed to the end wall adjacent the corner, said hook projecting outward at said corner and having its end portion extending along and spaced from said side wall, a bracket secured to the side wall and spaced from the hook, said reach arm assembly including a reach arm pivotally mounted on the vehicle, said reach arm being adapted to move into abutting relation with said side wall between the hook and the bracket, operating means to swing the reach arm away from the vehicle, said reach arm having a notch adjacent said pivotal mounting in position to engage the hook and the opposite end thereof having a finger in position to engage the bracket selectively upon transverse movement of the arm relative to the container.

3. In front end loader mechanism of the type having loading mechanism on a vehicle chassis for lifting a container to an elevated dumping position, the combination of a reach arm on the vehicle chassis separate from the engaging means, hinge means mounting one end of the reach arm for swinging movement on the chassis, means in the hinge means for transverse movement of the reach arm relative to the chassis, power means between the chassis and the reach arm for swinging the reach arm and for transversely moving the reach arm, a container having a body portion including a side wall and an end wall with a corner at the junction of the side wall and end wall, a hook affixed to the end wall adjacent the

5

corner and projecting outwardly from the corner in position to be engaged by the reach arm, and a bracket on the side wall spaced from the hook in position to accommodate the reach arm in abutting relation with the side wall between the bracket and the hook.

4. In front end loader mechanism of the type having engaging means on a vehicle chassis for lifting a container to an elevated dumping position, the combination of a reach arm on the vehicle chassis separate from the engaging means, said reach arm being journaled on a pin for swinging movement, said chassis having a slot adjacent the front end thereof, means mounting the pin in the slot for sliding movement longitudinally of the slot, power means extending between the chassis and the reach arm for swinging the reach arm and for moving the pin transversely in the slot, a container having a body portion including a side wall and end wall with a corner at the junction of the side wall and end wall, a hook affixed to the end wall adjacent the corner and projecting outwardly from the corner, and a bracket on the side wall spaced from the hook at a distance greater than the length of the reach arm, whereby the reach arm may be disengaged from the container upon retracting movement of the reach arm.

5. In front end loader mechanism of the type having

6

loading mechanism on a vehicle chassis for lifting a container to an elevated dumping position, the combination of a reach arm on the vehicle chassis separate from the engaging means, said reach arm being mounted on a hinge on the chassis for swinging movement relative thereto, said hinge including lost-motion means between the chassis and the reach arm, power means extending between the chassis and the reach arm for swinging the reach arm and for moving the reach arm on the lost-motion means, said container comprising a receptacle having a side wall and end wall with a corner at the junction of the side wall and end wall, a hook affixed to the receptacle adjacent the corner and projecting outwardly therefrom in position to be engaged by the reach arm, and a bracket on the side wall spaced from the hook in substantial horizontal alignment therewith to accommodate the reach arm in abutting relation with the side wall between the bracket and hook.

References Cited in the file of this patent

UNITED STATES PATENTS

2,799,418	Haldimann	July 16, 1957
2,900,096	Dempster et al.	Aug. 18, 1959
3,016,157	Brisson	Jan. 9, 1962