March 13, 1962 J. A. FREANEY 3,024,928

WASTE COLLECTION APPARATUS

Filed May 9, 1958 2 Sheets-Sheet 1

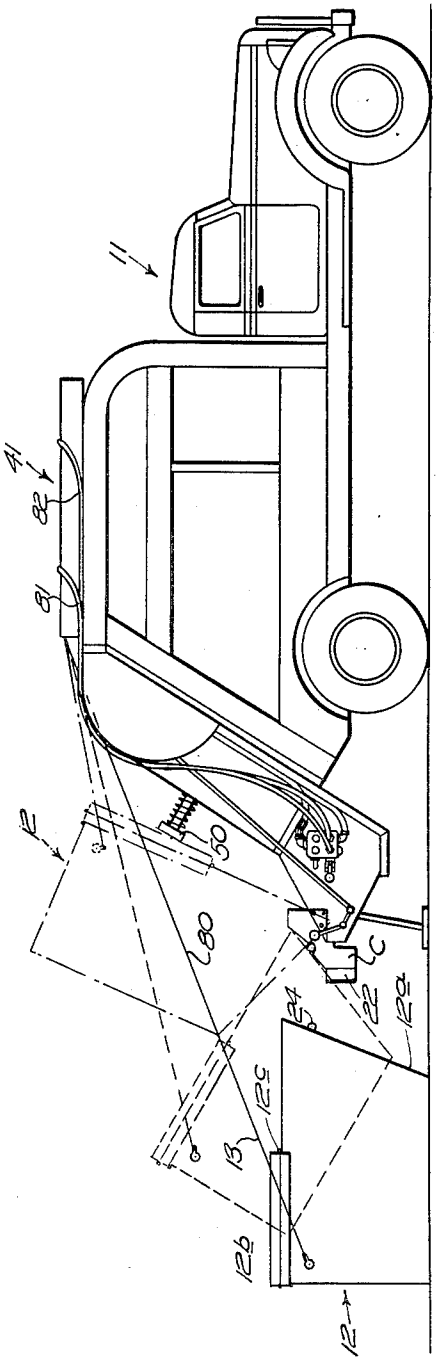

FIG. 1

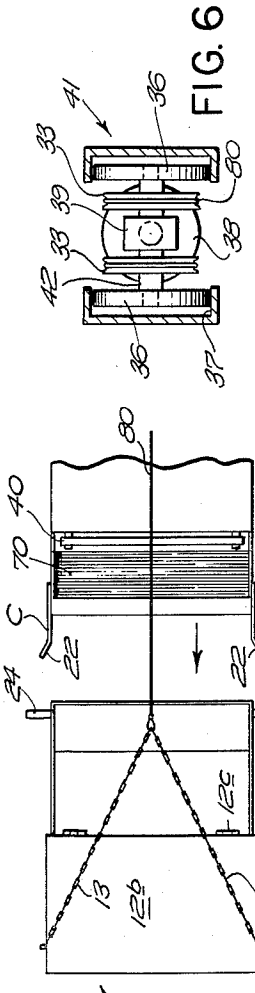

FIG. 6

FIG. 2

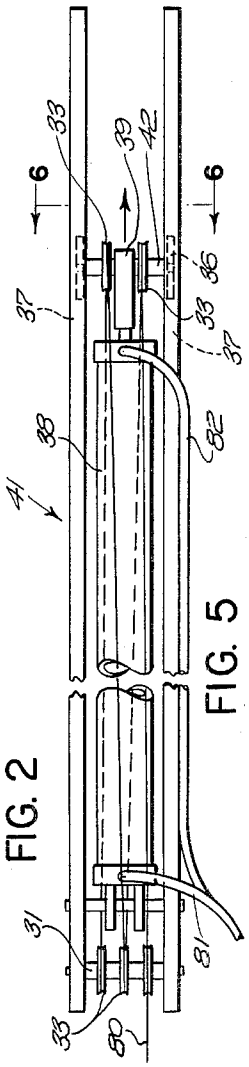

FIG. 5

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March 13, 1962 J. A. FREANEY 3,024,928

WASTE COLLECTION APPARATUS

Filed May 9, 1958 2 Sheets-Sheet 2

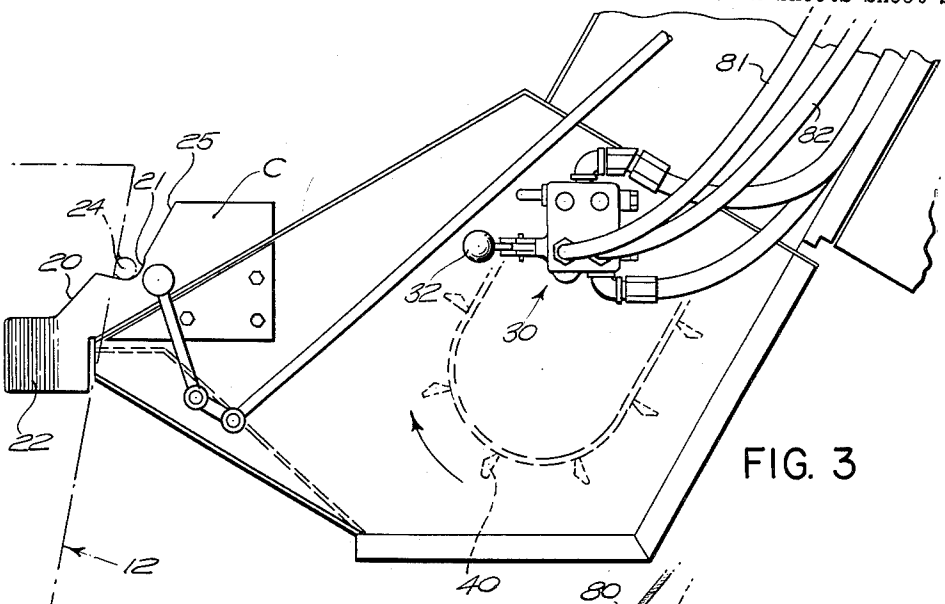

FIG. 3

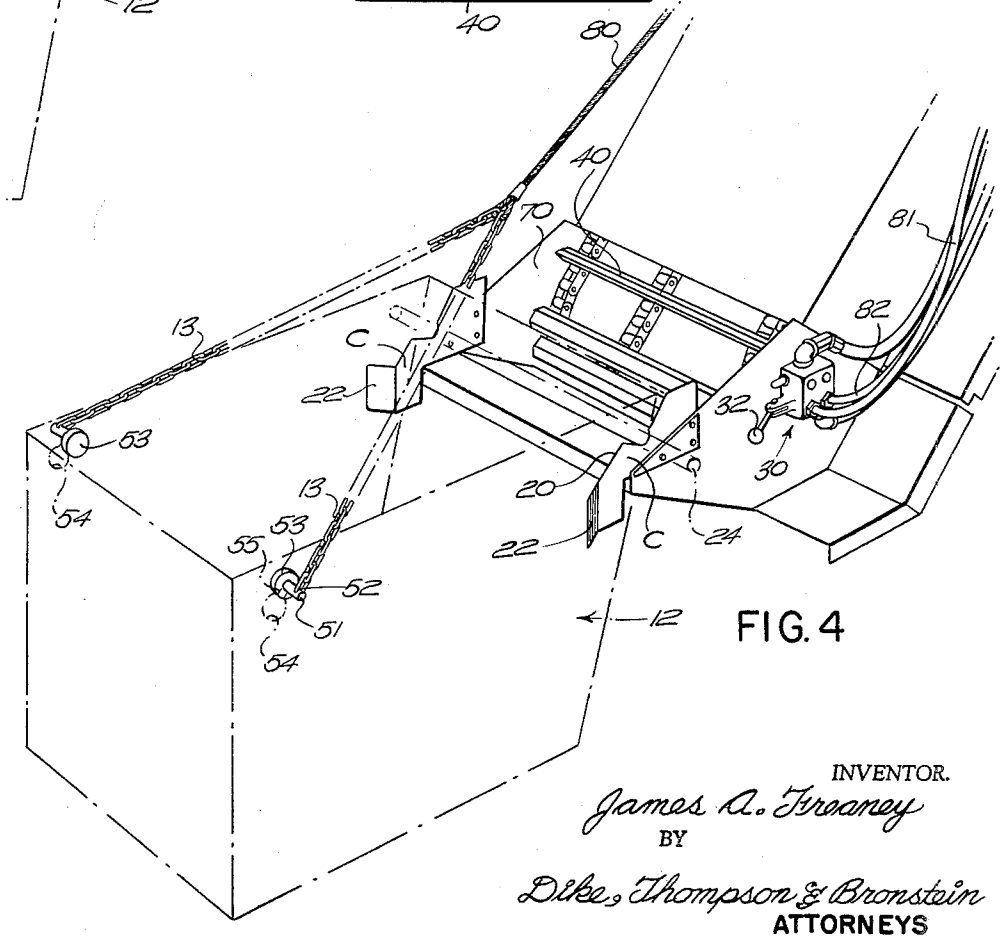

FIG. 4

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United States Patent Office 3,024,928 Patented Mar. 13, 1962

3,024,928

WASTE COLLECTION APPARATUS

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Filed May 9, 1958, Ser. No. 734,142
10 Claims. (Cl. 214—302)

My present invention relates to means for collecting refuse.

Heretofore one method of collecting refuse—particularly dry refuse such as waste paper, ashes, etc.—has been to provide barrels, rubbish boxes, or bins at various points in the area to be covered and go with a truck from one to another collecting their contents. Even when provided with an elevator within the body, such trucks usually carry a driver and two men. On arrival at the location of a bin or barrel, the driver backs the truck up to it and the two men pick up the bin or barrel and dump it into an opening in the back of the body from whence an elevator carries the refuse up into the body. The work of emptying the barrels or bins into the truck body is heavy and the presence of three men on the truck makes the collection of refuse expensive. The weight of the contents and the size of the barrel, box or bin is limited by the weight which two or three men can lift and empty into the truck.

My present invention, therefore, has for its object to provide means by which the collection of rubbish may be handled by the driver alone, thus doing away with the expense of one or two additional men.

Speaking generally, this is accomplished by constructing the truck so that when it is backed against the bin it automatically makes a hinge connection therewith, after which hoisting mechanism tilts the bin about the hinge and empties the bin directly into the truck body.

To make this possible, I provide the truck and the bin each with one-half of a horizontal hinge connection and arrange the parts so that if the center line of the truck does not coincide precisely with that of the bin, the bin will be shifted sidewise and an operative connection between the two halves of the hinge will be made. I also provide power-operated means by which the bin can be swung about the hinge pivot into emptying position so that the contents of the bin will fall directly into the truck body. As shown in the drawings, hydraulic-operating hoisting mechanism is conveniently employed and the control for it is placed on the side of the body at the rear so that the truck driver can stand beside the control mechanism (and, after having made sure that the truck is properly positioned with respect to the bin, can set the hoisting mechanism in operation, thereby tilting the bin about the hinge and emptying the contents into the body.

In practice, it is possible to employ bins of large capacity which when empty weigh as much as one thousand pounds and cannot be handled even by two men and yet can be emptied into the truck body by the driver of the truck working alone. Such bins or boxes can be left on location and do not have to be hauled away. Since they are not hauled away and interchanged, as is now customary, they can be painted to suit their particular locations. They are vermin-proof and cannot be upset or disturbed by children.

The hoisting mechanism carried on the top of the truck increases the height of the truck only by three or four inches and does not rise up when in operation; therefore, a bin can be placed inside a building such as a warehouse and the truck can enter and remove the contents of the bin as satisfactorily as if the bin were located out of doors.

By employing the combination of truck and bin embodying the present invention, I find that it is possible to

increase substantially the capacity of the truck, and consequently reduce materially the wasted time occupied in going to and from the incinerator or dumping place.

Referring now to the drawings:

FIG. 1 is a side elevation of a truck and a rubbish box conveniently called a bin, the bin being shown in three positions.

FIG. 2 is a plan view showing a bin, the rear end of a truck in the position occupied when the truck is being backed up to complete the hinge connection with the bin, and a hoisting cable and bridle in position.

FIG. 3 is a side elevation of the rear of the truck on a larger scale showing the control mechanism and the hinge.

FIG. 4 is a view in perspective of the rear end of the truck showing the bin in dot and dash lines.

FIG. 5 is a plan view of the hydraulically operating hoisting apparatus.

FIG. 6 is a section on line 6—6 of FIG. 5.

Refering now to the drawings and particularly to FIG. 1, the truck is shown at 11 and a bin at 12. Preferably the bin has vertical sides and back and an inclined front 12*a*. A cover 12*b* hinged at 12*c* is also provided.

At 24 is a horizontal rod forming, as will be explained, the pivot of a hinge or trunnion about which the bin can swing when it is being emptied.

The vehicle, ordinarily a truck, has a rear opening 70 and may have an elevator 40 by means of which rubbish dumped into the opening 70 will be carried up into the top and then fall down into the lower part of the body. The truck may be of standard construction and so constructed that the load may be dumped from the rear in the ordinary way.

Secured to each side at the back of the body are a pair of vertical guide plates C, C, constituting with the pivot rod or trunnion 24 on the bin, a hinge about which the bin can be swung and turned bottom up to empty out its contents. Each guide plate C has an outwardly flaring portion 22 (see FIG. 2) with a horizontal top edge, as shown in FIG. 3. Sloping upwardly from the horizontal top edge is an inclined portion 20 (see FIG. 3) above which is a curved portion forming a notch 21 which itself curves upward to meet another inclined portion 25. As will be seen from FIG. 3, the outwardly flared portions 22 of the two plates C are normally below the level of the hinge rod 24, and, therefore, when the truck is backed toward the bin 12 the ends of the hinge rod 24 are free to pass above the outwardly flared portions 22 of the plates C without striking them and when they come to the inclines 20 they ride up them into the notches 21. Therefore, when the operator backs the truck against the bin, the flaring projections 22 first strike the sides of the bin and push it to one side or the other thereby centering it, and thereafter, further backward movement of the truck causes the ends of the hinge rod on the bin 12 to ride up the inclines 20 on plates C and into the notches 21. After the ends of the rod 24 enter the notches 21, the rod acts as the pivot of a hinge and the bin 12 can be tilted into dumping position as shown in dot and dash lines in FIG. 1.

Mechanism for tilting the bin 12 about the pivot rod 24 to empty its contents into the back of the truck body is also provided. In the drawings, I have shown a bridle 13, 13 and a cable 80 connected to a hydraulically operated block and tackle 41 located on the top of the truck.

On the rear end of each part 13 of the bridle 13 is a connecting member located in a hole 54 and slot 55 (see FIG. 4) in the side of the bin 12. Each connecting member includes a stud 51 connected at 52 to the end of the bridle 13 and on its inner end a disk 53. The round hole 54 is large enough to allow the disk 53 to enter and the

slot 55 permits the pin 51 to be drawn forward by the bridle 13. Some such construction is desirable because it is dangerous to have the connection between the cable and the bin such that it can become disconnected during operation of the machine.

The hydraulically operated block and tackle is conveniently mounted on the top of the truck body and includes (see FIG. 5) a cylinder 38 on the front end of which is a cross-head 39 carrying an axle 42 on which are mounted two sheaves 33 and a pair of rollers 36 running in tracks 37. At the other end of the block and tackle is an axle 31 on which are two sheaves 33. The cable 80 passes about the several sheaves 33 so that when the cylinder 38, cross-head 39, and sheaves 33 thereon are moved to the right, as shown in FIG. 5, the cable 80 and attached bin 12 are drawn to the right and the bin 12 is swung about hinge rod 24 and tilted into emptying position. The hydraulic control box 30 for operating the block and tackle is located on the side of the truck and is operated by a control lever 32. The control box 30 is conected by pipes 81 and 82 to the opposite ends of the cylinder 38 on the top of the truck so that by moving the handle 32, the truck operator can control the direction and extent of movement of the cable and consequently of the bridle 13, 13 and bin 12. While other types of hoist may be used, the power operated block and tackle is particularly satisfactory because it can be placed on the top of an ordinary truck and does not increase its height substantially nor prevent the truck being backed into a warehouse or shed. This makes it possible to place the bin within doors or other protected location.

In the operation of the apparatus embodying my invention, the operator backs the truck up to the bin trying to have the center line of the truck coincide with the center line of the bin. Inevitably there is some slight variation but at the last end of the backward movement the flared members 22 on the truck push the bin sidewise enough so that it automatically centers itself with respect to the truck. Backing the truck a little more causes the rod or hinge member 24 to ride up the incline 20 on the plates C, C, until its ends enter the notches 21. This completes the hinge. Thereupon, the operator throws back the cover 12*b* of the bin and inserts the connecting members 50 in the holes 54 in the sides of the bin. He then goes to the control 30 and moves the control lever 32, causing the block and tackle hoist 41 to haul in on the connecting cable 80. Thereafter operation of the hoist causes the bin 12 to swing on the rod 24 as a hinge until the bin moves into the position shown in dash lines in FIG. 1. Further hauling in of the cable 80 tilts the bin into the position shown in dotted lines in FIG. 1 with its top against a stop or bumper 50 on the back of the body. As the bin 12 reaches this position, its contents begin to fall out and by about the time it reaches the dotted line position shown in FIG. 1, it is completely emptied. When the bin has emptied itself, the operator reverses the hoist and the bin swings back about the hinge rod 24 until it rests on the ground. Then the operator disconnects the connecting members 50 from the holes 54 and slots 55 in the sides of the bin. Thereafter the operator can drive the truck away and the hinge automatically separates into its two component parts as the two hinge members C, C ride out from under the rod 24 when the truck moves forward. Thus, the bin is left in its original position and the connection at the hinge broken without the truck driver doing anything other than to unhitch the bridle from the sides of the bin.

It is sometimes found that if the truck is already heavily loaded or if the wheels happen to be in a hole near the bin, the hinge rod 24 is too high to engage the notch 21. Under these circumstances the tail of the truck body can be raised by the truck dumping mechanism (not shown) enough to bring the hinge rod on a level with the notch so that it can be readily engaged, and the bin hoisting mechanism operated as if the body of the truck were at the proper level.

In practice it is found that standard trucks can be employed for the purposes described, it being necessary only to add the two hinge plates C, C at the rear and secure the hoisting mechanism to the roof of the truck body. Also, that the apparatus does not interfere in any way with the dumping of the truck or, if desired with its use in connection with ordinary manual loading. Furthermore, it is found that trucks having capacity larger than normal may be used even when operated by a single man.

I claim:

1. The combination of a refuse collection truck having a body with an opening in the back, a refuse bin, the lower edge of said body opening being at a level no higher than the top front edge of said bin, a separable hinge connection about which said bin may be tilted, one part of said hinge connection being at the back of the truck body in vertically stationary position, the other part of said hinge connection being on said bin, said parts being in position to engage one another when the truck is backed up to the bin, and mechanism on the truck to tilt the bin about said hinge connection directly from hinge-engaging position into dumping position.

2. The combination of a refuse collection truck having a body with an opening in the back, a stationary refuse bin, the lower edge of said body opening being at a level no higher than the top front edge of said bin, a separable hinge connection about which said bin may be titled, one part of said hinge connection including a projection from each side of said bin near said top front edge thereof, the other part of said hinge connection comprising a pair of spaced hinge members at the back of the truck body in vertically stationary position, said hinge members being more widely spaced than the width of said bin and spaced less than the distance between the outer ends of said projections, said hinge members each having an upwardly inclined top surface beginning at a level below the level of the projections from ground and rising to a notch into which said projections will be located when the truck is backed up to the bin, and mechanism on the truck to tilt the bin about said hinge connection directly from hinge-engaging position into dumping position.

3. The combination of a refuse collection truck having a body with an opening in the back, a stationary refuse bin, the lower edge of said body opening being at a level no higher than the top front edge of said bin, a separable hinge connection about which said bin may be tilted, one part of said hinge connection including a projection from each side of said bin near said top front edge thereof, the other part of said hinge comprising a pair of spaced hinge members at the back of the truck body in vertically stationary position, said hinge members being more widely spaced than the width of said bin and spaced less than the distance between the outer ends of said projections, said hinge members each having an upwardly inclined top surface beginning at a level below the level of the projections from ground and rising to a notch into which said projections wil be located when the truck is backed up to the bin, each of said notches having a slight upward inclination in the rearward direction and mechanism on the truck connectable with the bin to tilt it about said hinge connection directly from hinge-engaging position into dumping position.

4. The combination of a refuse collection truck having a body with an opening in the back, a stationary refuse bin, the lower edge of said body opening being at a level no higher than the top front edge of said bin, a separable hinge connection about which said bin may be tilted, one part of said hinge connection including a projection from each side of said bin near the top front edge thereof, the other part of said hinge comprising a pair of spaced hinge members at the back of the truck

body in vertically stationary position, said hinge members each having an outward flare rearwardly of the truck and each having an upwardly inclined top surface beginning at a level below the level of the projections from ground and rising to a notch into which said projections will be located when the truck is backed up to the bin, the outwardly flared portions of said hinge members being more widely spaced than the width of said bin and the notched portions being less widely spaced than the distance from one side of said bin to the outer end of the projection from the opposite side of said bin to center said bin with respect to the truck body when the truck is backed up to the bin, and mechanism on the truck connectable with the bin to tilt it about said hinge connection directly from hinge-engaging position into dumping position while continuously urging said proections into said notches.

5. The combination of a refuse collection truck having a body with an opening in the back, a refuse bin, the lower edge of said body opening being at a level no higher than the top front edge of said bin, connection means on the truck extending rearwardly of the back of the truck for connecting said bin and truck, said connection means including a pair of members spaced transversely of said truck and having an outward flare in the rearward direction which is wider than said bin, and said connection means further comprising one part of a separable hinge connection at the back of the truck body in vertically stationary position, another part of said separable hinge connection affixed to said bin, said parts being in position to engage one another when the truck is backed up to the bin and said bin is centered by the flared members, and mechanism on the truck acting on the bin to tilt it about said hinge connection directly from hinge-engaging position into dumping position.

6. The combination of a refuse collection truck having a body with a low opening in the back, a refuse bin having a width less than that of the body and a length greater than said width, the lower edges of said body opening being at a level no higher than the top front edge of said bin, an elevator within the body in the form of a conveyor for continuously carrying refuse dumped into said opening up into the top of said body from where it can fall into the lower part of the body, a separable hinge connection about which said bin may be tilted, one part of said hinge connection being at the back of the truck body in vertically stationary position, the other part of said hinge connection being on said bin, said parts being in position to engage one another when the truck is backed up to the bin, and mechanism on the truck acting on the bin to tilt it about said hinge connection directly from hinge-engaging position into dumping position.

7. The combination of a refuse collection truck having a body with a low opening in the back, a refuse bin having a width less than that of the body and a length greater than said width, said bin having a front sloping rearwardly from the top front edge of the bin, the lower edge of said body opening being at a level no higher than the top front edge of said bin, a separable hinge connection about which said bin may be tilted, one part of said hinge connection being at the back of the truck body in vertically stationary position, the other part of said hinge connection being on said bin near the top front edge, said parts being in position to engage one another when the truck is backed up to the bin, a cover for the top of the bin movable to open the top front part of the bin while keeping the remaining part closed, and mechanism on the truck acting on the bin to tilt it about said hinge connection directly from hinge-engaging position to a dumping position in which the rear of said bin is tilted to heights from which refuse gravitates down said sloping front into the low truck body opening.

8. The combination of a refuse collection truck having a body with a low opening in the back, a refuse bin having a width less than that of the body and a length greater than said width, said bin having a front sloping rearwardly from the top front edge of the bin, the lower edge of said body opening being at a level no higher than the top front edge of said bin, an elevator within the truck body in the form of a conveyor for continuously carrying refuse dumped into said low opening up into the top of the body from where it can fall into the lower part of the body, a separable hinge connection about which said bin may be tilted, one part of said hinge connection being at the back of the truck body in vertically stationary position, the other part of said hinge connection being on said bin near the top front edge thereof, said parts being in position to engage one another when the truck is backed up to the bin, and cable-winding means on the truck connectable with the bin to tilt it about said hinge connection directly from hinge-engaging position to a dumping position in which the rear of the bin is tilted to a height at which all refuse in the bin is gravitated down said sloping front into said low truck body opening, said length of said bin being no greater than that which will bring the rear top edge of said bin to a level substantially the same as the top of said truck when said bin is tilted to said dumping position about said hinge connection.

9. The combination as set forth in claim 8 wherein said cable-winding means comprises a horizontal power-operated block and tackle on the top of said truck body, and cooperating separable fastening means at the end of the cable from said block and tackle and at the rear upper part of said bin for connecting said block and tackle with said bin.

10. The combination of a refuse collection truck having a body with a low opening in the back, a stationary refuse bin having a width less than that of the body and a length greater than said width, said bin having a front sloping rearwardly from the top front edge of the bin, the lower edge of said body opening being at a level no higher than the top front edge of said bin, an elevator within the truck body in the form of a conveyor for continuously carrying refuse dumped into said low opening up to the top of the body from where it can fall into the lower part of the body, a separable hinge connection about which said bin may be tilted, one part of said hinge connection comprising a rod projecting sidewise of said bin near the top front edge, the other part of said hinge connection comprising a pair of spaced hinge members at the back of the truck body in vertically stationary position, said hinge members each having an outward flare rearwardly of the truck and each having an upwardly inclined top surface beginning at a level below the level of said hinge rod from ground and rising to a notch into which the sidewise projections of the rod can be driven when the truck is backed up to the bin, said hinge members further having inclined surfaces rising upwardly from said notches, each of said notches having a slight upward inclination in the rearward direction to promote separation of said rod and hinge members when the truck is moved forward away from the bin, cable-winding means on the truck, cooperating separable fastening means at the end of the cable and at the rear upper part of the bin for connecting the cable-winding means with the bin to tilt the bin about said hinge connection directly from hinge-engaging position to a dumping position in which the rear of the bin is tilted to a height at which all refuse in the bin is gravitated down said sloping front into said low truck body opening, said length of the bin being no greater than that which will bring the rear top edge of the bin to a level substantially the same as the top of said truck when said bin is tilted to said dumping position about said hinge connection.

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