March 25, 1958 C. T. LINK, JR., ET AL 2,828,037

STREET SWEEPER DIRT BOX ASSEMBLY

Filed Sept. 24, 1954 3 Sheets-Sheet 1

Fig. 1

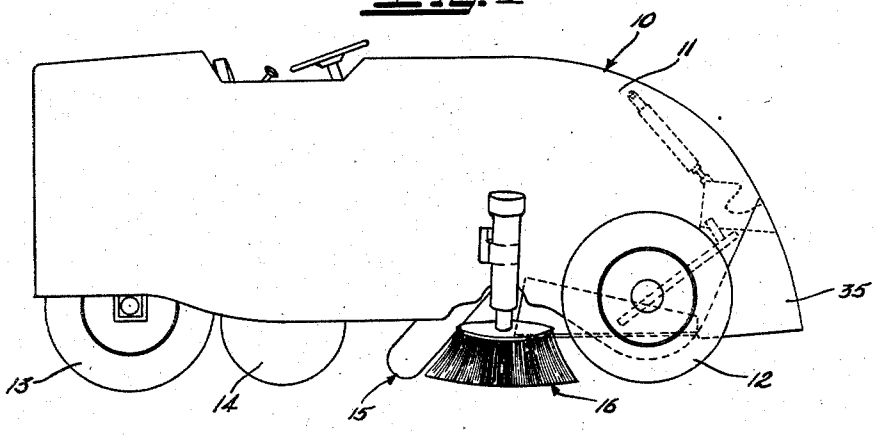
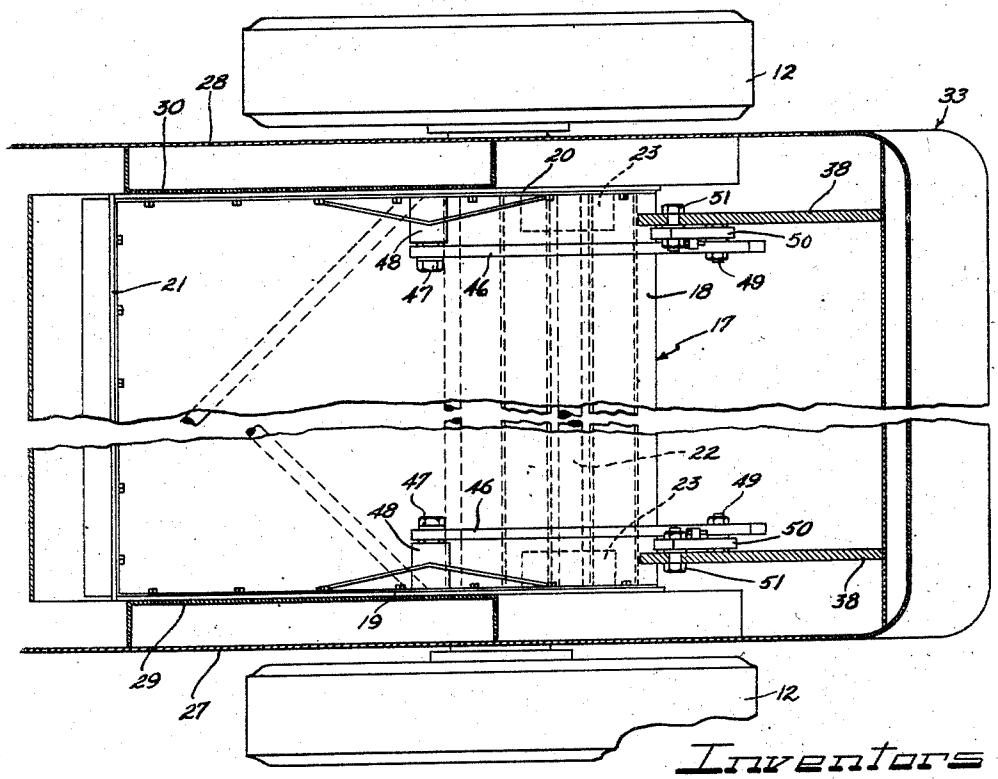


Fig. 4



Inventors

Charles T. Link, Jr.

Robert F. Schmidt

John S. Gooden

Hill, Sherman, Meroni, Gross & Simpson

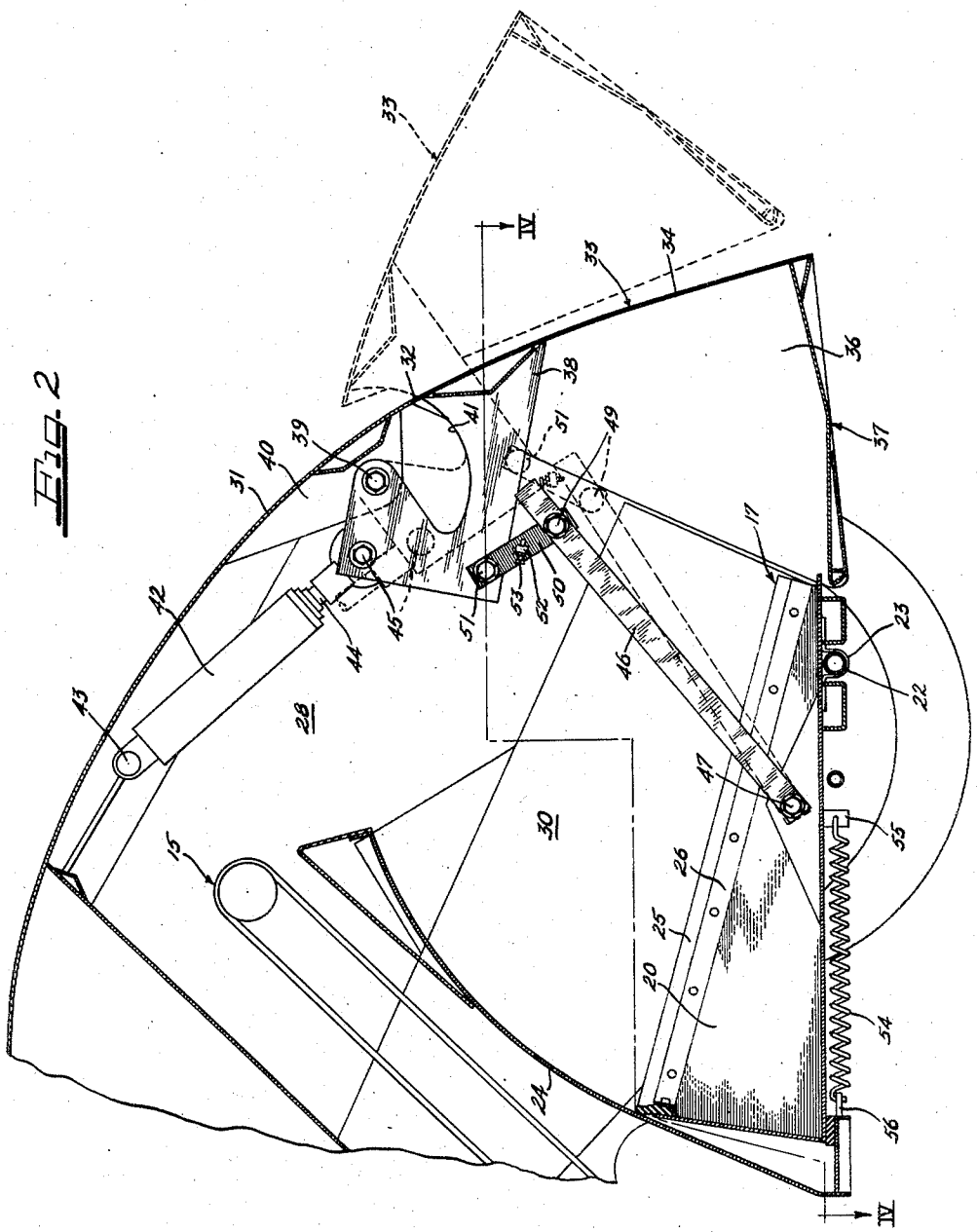
By Attys.

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STREET SWEEPER DIRT BOX ASSEMBLY

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Fig. 2



Inventor
Charles T. Link, Jr.
Robert F. Schmidt
John S. Gooden

By Hill, Sherman, Meroni, Gross & Simpson Attys.

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STREET SWEEPER DIRT BOX ASSEMBLY

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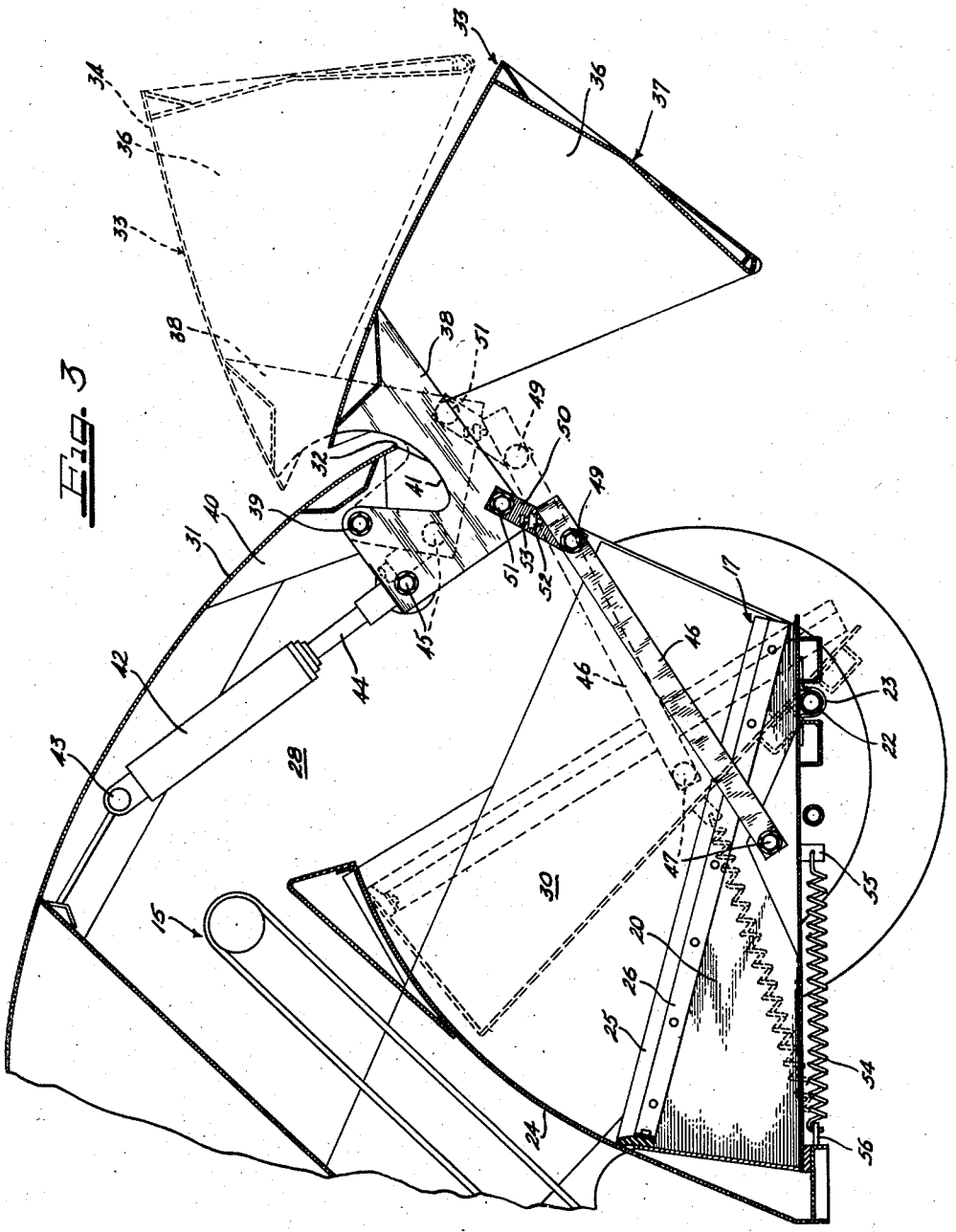


Fig. 3

Inventor
CHARLES T. LINK, JR.
ROBERT F. SCHMIDT
JOHN S. GOODEN

by Hill, Sherman, Meroni, Gross & Simpson Attys.

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2,828,037

STREET SWEEPER DIRT BOX ASSEMBLY

Charles T. Link, Jr., Skokie, Robert F. Schmidt, Elgin, and John S. Gooden, Chicago, Ill., assignors to Elgin Sweeper Company, Elgin, Ill., a corporation of Illinois

Application September 24, 1954, Serial No. 458,176

6 Claims. (Cl. 214—508)

This invention relates to a street sweeper dirt box assembly, and more particularly to a readily constructed and operated, efficient reliable dirt box assembly arranged to provide maximum dirt storage capacity within the minimum over-all size of the street sweeper.

In the dirt box assembly of this invention, a dirt box may have a floor arranged to receive and support dirt and may also have a pair of side walls and at least one end wall to prevent flow of the dirt off of the floor. The dirt box may normally be in a position with the floor in a generally horizontal dirt-receiving position but is arranged to be tilted to a position to discharge the dirt therefrom.

The dirt box may receive dirt directly from a street sweeper broom, but, most preferably, the sweeper has an upwardly inclined conveyor for receiving dirt from the broom and conveying the dirt upwardly to discharge the dirt down onto the dirt box floor which is disposed in underlying relation to an upper portion of the conveyor.

According to a specific feature of the invention, the dirt box has one end portion in relatively closely spaced relation to the lower end of the conveyor with the opposite end portion thereof projecting beyond a point in vertical alignment with the upper end of the conveyor so as to make maximum use of the space below the conveyor within the street sweeper.

The dirt box is tiltable to discharge dirt from the end thereof spaced furthest from the lower end of the conveyor, most preferably about an axis adjacent such end. According to a specific feature of the invention, a baffle plate may be provided for engaging the end of the dirt box closest to the conveyor during tilting movement of the dirt box, the baffle plate being disposed in an arc about the axis of tilting movement of the dirt box in relatively closely spaced relation to the underside of the upwardly inclined conveyor. It will be appreciated that with this construction, the space in the street sweeper is utilized to a maximum advantage for the accumulation of dirt.

According to a further feature of the invention, the street sweeper comprises a housing having an opening therein with a door, preferably hinged, being provided for closing the opening, the dirt box being disposed within the housing and being arranged to discharge out such opening when the door is opened.

According to a specific feature of the invention, means are provided connecting the door to the dirt box whereby the dirt box automatically discharges out through the opening when the door is opened. Such means connecting the dirt box to the door may most preferably be arranged to actuate the dirt box only after the door is opened to a predetermined extent.

The door may be manually actuated but, most preferably, fluid actuated means are provided for actuating the door, the dirt box being actuated from the door through the above-referred connection means between the dirt box and the door.

According to still another feature of the invention, the door carries floor means forming a continuation of the dirt box floor so that an auxiliary or second dirt box is provided. The door may be tiltable away from the dirt box to discharge from the floor means carried thereby, with the dirt box being thereafter tiltable to discharge dirt from the floor thereof through the space initially occupied by the floor means carried by the door. It will be appreciated that this construction provides a pair of dirt boxes with the dirt box defined by the door discharging first and the main dirt box being thereafter actuated to a discharge position.

A still further specific feature resides in the connection means between the door and the main dirt box by which the door is opened to a predetermined extent before the dirt box is actuated, the dirt box being actuated only with further opening movement of the door. Although any known type of lost-motion connection might suffice as a connection between the door and the dirt box, the connection, according to this invention, comprises a pair of pivotally connected links with adjustable means for limiting relative pivotal movement of the links. More specifically, the connection may comprise a first link pivoted on a first axis to the dirt box, a second link pivoted to the first link on a second axis and pivoted to the door on a third axis with such second axis being normally disposed a substantial distance from a line through the first and third axes, adjustable means being provided for limiting movement of such second axis toward such line. Preferably, such adjustable means may comprise a screw threaded on one of the links and engageable with the other of the links.

It will be apparent that this invention provides a readily constructed and operated, efficient and reliable dirt box assembly arranged to provide maximum dirt storage capacity with minimum overall size of the street sweeper.

It will further be apparent that the principles of this invention are not necessarily limited to street sweepers but may be applied to any machine or structure wherein it is desired to accumulate dirt, refuse, or any materials having similar characteristics, and the terms dirt and street sweeper are, therefore, used in a sense to include equivalent materials, machines, or structures.

An object of this invention, accordingly, is to provide a readily constructed and operated, efficient and reliable dirt box assembly arranged to provide maximum dirt storage capacity with minimum overall size of the street sweeper.

A further object of this invention is to provide an improved dirt box assembly including a door arranged for closing and opening in the housing of a street sweeper where the dirt box in the housing is arranged to discharge out such opening when the door is opened.

Another object of this invention is to provide an improved dirt box assembly in which connection means are provided between a door and a dirt box to actuate the dirt box after the door is opened to a predetermined extent.

A still further object of this invention is to provide an improved dirt box assembly in which a door is formed with four means forming a continuation of a dirt box floor, to thus provide a pair of dirt boxes.

Still another object of this invention is to provide improved connection means between tiltable dirt box structures or the like.

This invention contemplates other objects, features and advantages which will become more fully apparent from the following detailed description taken in conjunction with the accompanying drawings which illustrate a preferred embodiment and in which:

Figure 1 is a side elevational view of a street sweeper machine utilizing a dirt box assembly constructed in accordance with the principles of this invention;

Figure 2 is a sectional elevational view through a for-

ward portion of the street sweeper of Figure 1, illustrating the dirt box assembly in enlarged detail;

Figure 3 is a view similar to Figure 2 but illustrating the parts in an intermediate actuated condition; and

Figure 4 is a sectional view taken substantially along lines IV—IV of Figure 2.

Reference numeral **10** generally designates a street sweeper incorporating a dirt box assembly constructed according to the principles of this invention which may comprise a housing **11** supported on a pair of front wheels **12** and a single steerable rear wheel **13**, a main broom **14** which is rotated to throw dirt or refuse onto the lower end portion of an upwardly inclined conveyor **15** and a side broom **16** arranged to engage in the street gutter and throw refuse or dirt into the path of the main broom **14**.

The conveyor **15** may be inclined forwardly and the dirt box assembly of this invention may be located at the forward end of the sweeper **10** to receive dirt from the conveyor **15** and accumulate or store dirt until a convenient point for discharge of the dirt is reached, whereupon the dirt box assembly may be actuated to discharge the dirt.

According to this invention, the dirt box assembly may comprise a main dirt box generally designated by reference numeral **17** which may comprise a floor **18** normally disposed in a generally horizontal position to receive dirt from the upper end of the conveyor **15**, a pair of side walls **19** and **20** and a rearward end wall **21** for preventing flow of dirt off of the dirt box floor **18**.

It will be noted that the rearward end of the dirt box **17** is disposed in relatively closely spaced relation to the lower end portion of the conveyor and that the dirt box **17** is in underlying relation to the upper end portion of the conveyor **15**. With this arrangement, the space within the housing **11** of the street sweeper **10** is utilized to maximum advantage for dirt storage.

The dirt box **17** may be supported for tilting movement between a position as illustrated in full lines in Figures 2 and 3 and a position as illustrated in dotted lines in Figure 3 to discharge dirt therefrom, preferably about an axis adjacent the forward end thereof so that the dirt is discharged from such forward end. To provide this tiltable support, an axle **22** may be supported between the side walls of the housing **11** and the dirt box **17** may have a pair of brackets **23** secured to the underside of the floor **18** to pivotally secure the dirt box **17** on the axle **22**.

According to a specific feature of the invention, a baffle plate **24** is provided for engaging the rearward end of the dirt box during tilting movement thereof, the baffle plate **24** being disposed generally in an arc about the axis of the axle **22** and being disposed in relatively closely spaced relation to the underside of the upper portion of the upwardly inclined conveyor **15**. The baffle plate **24** is, of course, rigidly supported between the side walls of the housing **11** of the street sweeper **10**.

To provide a seal between the dirt box **17** and the portions of the housing cooperating therewith, a strip **25** of flexible resilient material may extent around the upper edges of the side walls **19** and **20** and the rearward end wall **21** of the dirt box **17**, the strip **25** being secured to the side and end walls by a strap **26** bolted to the side and end walls and clamping the strip **25** thereto, the strip **25** being urged by its own resilience into pressure contact with the side walls of the housing **11** and with the baffle plate **24** so as to provide a seal.

It should be noted that the side walls of the housing **11**, to which reference numerals **27** and **28** are applied, carry plates **29** and **30** spaced inwardly therefrom on opposite sides of the dirt box **17** adjacent the sides **19** and **20**, respectively, thereof to provide space for the journalling of the front wheels **12** of the sweeper **10**. The plates **29** and **30** are, of course, engaged by the strip **25** of flexible resilient material to provide the seal between the dirt box **17** and the sides of the housing **11**.

The housing **11** has a top wall **31** which is sloped downwardly at the forward end thereof and terminated at an edge **32** spaced upwardly from the plane of the dirt box floor **18** in its normal position. The side walls **27** and **28** of the housing **11** have forward edges extending between the ends of the edge **32** of the top **31** to points generally in alignment with the forward edge of the dirt box floor **18**. There is thus provided an opening at the forward end of the housing **11**.

This opening is arranged to be closed by means of a door generally designated by reference numeral **33** which comprises a forward wall **34** arranged to extend downwardly and slightly forwardly from the edge **32** of the top wall **31** of the housing **11** to form a continuation of the top wall **31**, a pair of generally triangularly shaped side walls **35** and **36** arranged to form continuation of the side walls **27** and **28**, respectively, of the housing **11**, and floor means generally designated by reference numeral **37** arranged for disposition in a generally horizontal plane to form a continuation of the floor **18** of the main dirt box **17**. The door **33** thus provides an additional dirt box.

The door **33** is supported for tilting movement away from the dirt box **17** out of closing relation to the opening in the forward end of the housing **11** to discharge dirt from floor means **37** and also to allow discharge of the dirt from the dirt box **17**.

For this purpose, a pair of plates **38** are secured to and projected rearwardly from upper end portions of the wall **34** of the door **33** and are pivotally secured by means of pins **39** to a pair of plates **40** secured to and extending rearwardly and downwardly from the top wall **31** of the housing **11** above the edge **32** thereof. The plates **38** may preferably have recessed upper edge portions **41** concavely arcuate about the axis of pins **39** so that the axis of tilting movement of the door **33** is as high as possible and yet the plates **38** clear the edge **32** of the top **31**.

The door **33** may preferably be power-actuated and, for this purpose, a pair of hydraulic cylinders **42** may be pivoted by means of pins **43** to the housing **11** with piston rods **44** projecting from the cylinders **42** being pivotally connected to the plates **38** by means of pins **45**. By actuation of the cylinders **42**, the piston rods **44** may be forced downwardly and forwardly to pivot the door **33** from the full line position of Figure 2 through the dotted line position of Figure 2 (the full line position of Figure 3) to the dotted line position of Figure 3. It may be noted that the cylinders **42** are in relatively closely spaced relation under the top **31** of the housing **11** so as to be out of the path of dirt discharged from the conveyor **15** and dirt accumulating in the dirt box assembly. It might also be noted that the plates **38**, in addition to providing a pivotal support for the door **33**, also serve as a means for connecting the door **33** to the pistons **44** of the hydraulic cylinders **42**.

An important feature of the present invention resides in a connection between the door **33** and the dirt box **17** by which the dirt box **17** is actuated by outward movement of the door **33** but not until the door **33** is opened to a predetermined extent.

According to this feature, a pair of links **46** are pivotally secured by means of pins **47** to bosses **48** projecting inwardly from the sides **19** and **20** of the dirt box **17**. The other ends of the links **46** are pivoted by means of pins **49** to links **50** which are, in turn, pivoted to the plates **38** by means of pins, or bolts, **51**.

In the normal position of the door **33**, as illustrated in full lines in Figure 2, the axis of the pins **49** is spaced a substantial distance forwardly from a line through the axes of the pins **47** and **51**. With this arrangement, the door **33** may be tilted forwardly and upwardly a sub-

stantial distance before actuation of the dirt box **17**, for example, to a position as illustrated in dotted lines in Figure 2, or as illustrated in full lines in Figure 3.

However, when this position is reached, means are provided limiting further movement of the pins **49** toward the line between the axes of the pins **47** and **51** and with further outward movement of the door **33**, the dirt box **17** will be tilted upwardly about the shaft **22** to a discharge position as illustrated in dotted lines in Figure 3.

For limiting relative pivotal movement between the links **46** and the links **50**, the links **50** may have inwardly projecting bosses intermediate the pins **49** and **51** through which bolts **53** are threaded, the ends of the bolts being engageable with end portions of the links **46** to limit movement of the pins **49** toward a line between the axes of the pins **47** and **51**. The point at which further movement is prevented may be adjusted, of course, by adjustment of the bolts **53**.

It could happen that the dirt box **17** might be left in a position as illustrated in dotted lines in Figure 3 and that mud or the like might prevent the dirt box **17** from dropping to its normal position of Figure 2 under its own weight. To insure that the dirt box **17** will drop to its normal position of Figure 2, a coiled tension spring **54** is disposed under a central portion of the dirt box **17** and has one end secured to a bracket **55** secured to the underside of the dirt box floor **18** with its other end being secured to a bracket **56** fixedly supported from the housing of the sweeper.

It will be apparent, accordingly, that this invention provides a readily constructed and operated, efficient and reliable dirt box assembly which achieves maximum dirt storage capacity within a street sweeper housing of minimum overall size.

It will be understood that modifications and variations may be effected without departing from the spirit and scope of the novel concepts of the present invention.

We claim as our invention:

1. In a street sweeper or the like, an upwardly inclined conveyor, a dirt box disposed in underlying relation to an upper portion of said conveyor and tiltable upwardly about an axis adjacent the end thereof spaced furthest from the lower end of said conveyor, and a stationary baffle plate for engaging the other end of said dirt box during tilting movement thereof and disposed in an arc about said axis in relatively closely spaced relation to the underside of said upper portion of said conveyor.

2. In a street sweeper, a housing, an upwardly inclined conveyor within said housing, a dirt box having a floor normally disposed in a horizontal plane below the upper end portion of said conveyor, means adjacent the end of said dirt box remote from said conveyor for supporting said dirt box for upward pivotal movement about a horizontal axis parallel to said conveyor with the other end of said dirt box being thereby moved in an arc adjacent the underside of the upper end portion of said conveyor, a door pivotal on said housing for movement about an axis parallel to said horizontal axis and spaced upwardly therefrom, said door including a generally vertical wall forming an end wall for the housing and a bottom wall forming a continuation of said dirt box floor, said door being pivoted outwardly and said dirt box being pivoted upwardly to discharge dirt from said housing.

3. A street sweeper according to claim 2 further including means acting between said door and said housing for pivoting said door outwardly, and a lost-in motion linkage between said door and said dirt box for pivoting said dirt box upwardly after said door has been moved outwardly to a certain extent.

4. A street sweeper according to claim 3 in which said linkage comprises a first link pivoted on a first axis to said dirt box, a second link pivoted to said first link on a second axis and pivoted to said door on a third axis, said second axis being normally disposed a substantial distance from a line through said first and third axes, and adjustable means for limiting movement of said second axis toward said line.

5. A street sweeper according to claim 4 in which said adjustable means comprises a screw threaded on one of said links and engageable with the other of said links.

6. In a street sweeper, a housing having side walls, an upwardly inclined conveyor within said housing, a dirt box having a floor normally disposed in a horizontal plane below the upper end of said conveyor, means adjacent the end of said dirt box remote from said conveyor for supporting said dirt box for upward pivotal movement about a horizontal axis parallel to said conveyor with the other end of said dirt box being thereby moved in an arc adjacent the underside of the upper end portion of said conveyor, and a door pivoted on said housing for movement about an axis parallel to said horizontal axis and spaced upwardly therefrom, said door including a generally vertical wall forming an end wall for the housing, a pair of side walls forming continuations of the side walls of said housing, and a bottom wall forming a continuation of said dirt box floor, said door being pivoted outwardly and said dirt box being pivoted upwardly to discharge dirt from said housing.

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