Jan. 21, 1947. L. SPINKS 2,414,774

DISPOSAL APPARATUS

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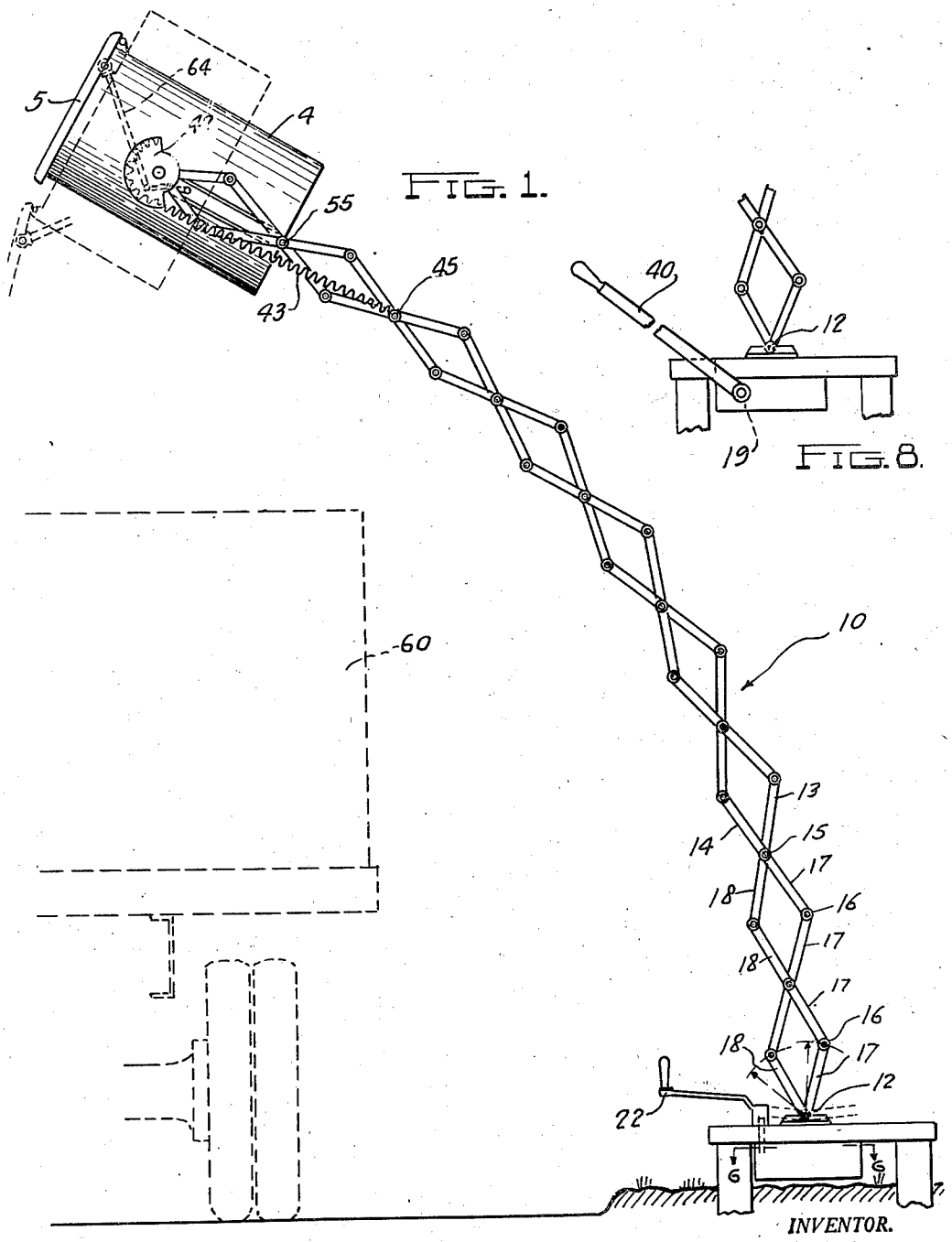


FIG. 1.

FIG. 8.

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DISPOSAL APPARATUS

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FIG. 2.

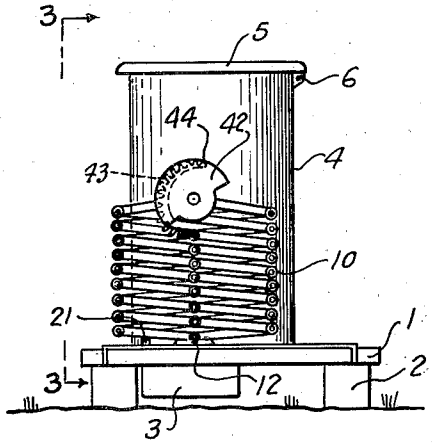


FIG. 3.

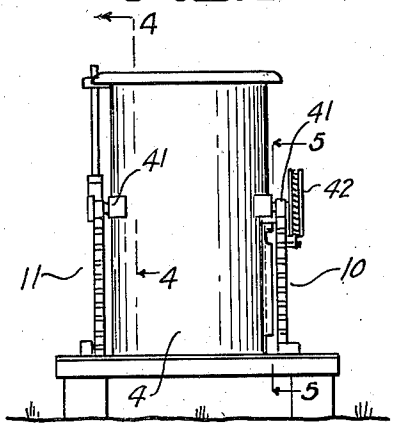


FIG. 4.

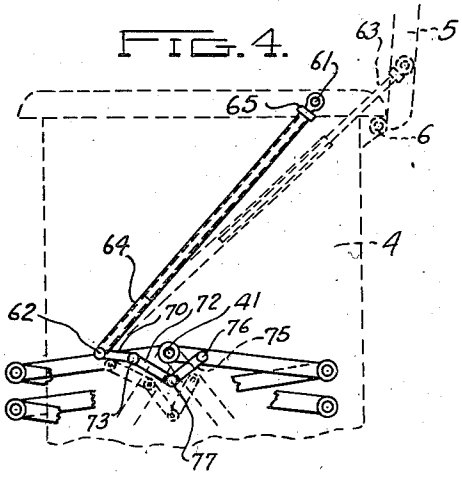


FIG. 5.

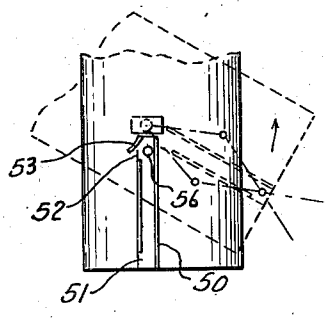
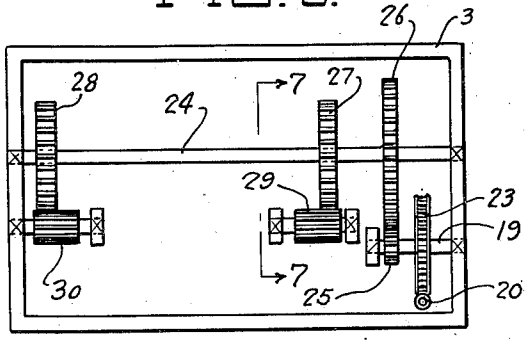


FIG. 6.



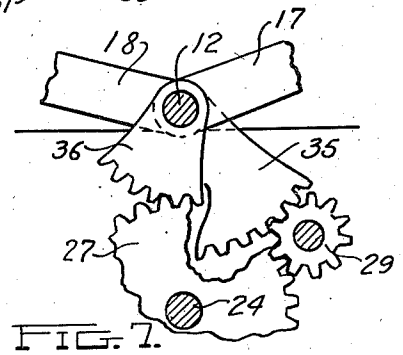


FIG. 7.

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2,414,774

DISPOSAL APPARATUS

Luff Spinks, Detroit, Mich.

Application April 11, 1945, Serial No. 587,801

10 Claims. (Cl. 214—116)

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This invention relates to an apparatus especially suitable and useful for the disposal of refuse or the like and for the loading of the refuse into transporting vehicles such as trucks, or trailers or the like.

It is quite generally appreciated that the maintenance of alleys or back drives or easements in a proper clean and sanitary condition is a problem of immense proportions. Even though the refuse be placed in proper receptacles or cans they are liable to be turned over so as to spill the refuse over the alley. Moreover, it requires a considerable crew of men to pick up the refuse and load the same into transporting vehicles as the receptacles, even assuming that the refuse is properly contained in the receptacles, have to be picked up and dumped into a vehicle body, the height of which may be in excess of six feet from the ground. One way this is accomplished is for the driver of the vehicle to drive down the middle of the alley while several men walk along each side of the alley to pick up the receptacles and dump the same into the vehicle.

The present invention aims to provide an improved receptacle and a lifting and dumping mechanism therefor. The receptacle is firmly held in position on a suitable base so that it is not liable to be turned over or otherwise mishandled so that the refuse will spill in the alley, and the structure involves a mechanism, which by a simple operation, makes it feasible for one workman to operate so that the receptacle is elevated into a position overlying the vehicle and then tipped to discharge the contents thereof into the vehicle body. This reduces the number of men required and promotes discharge of the entire contents into the vehicle.

In accordance with the invention, the receptacle is mounted on a base structure which supports the elevating mechanism and in the operation of this structure the receptacle is not only elevated but is moved angularly so as to overlie a vehicle stationed alongside of the receptacle. When the receptacle is properly elevated it is turned or swung to discharge the contents thereof. The receptacle may be used for any and all kinds of refuse or waste material whether it be ashes or food refuse or the like.

A structure made in accordance with the invention is diclosed in the accompanying drawings:

Fig. 1 shows the apparatus with the receptacle in a position about to be actuated to discharge its contents into the vehicle body.

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Fig. 2 is a side elevational view with the receptacle in its normal position.

Fig. 3 is an elevational view taken in a direction of line 3—3 of Fig. 2.

Fig. 4 is a view illustrating the construction for holding and manipulating the cover of the receptacle.

Fig. 5 is a somewhat diagrammatic view illustrating the action of the receptacle.

Fig. 6 is a view illustrating the mechanism incorporated in the base structure.

Fig. 7 is an enlarged view of the operating mechanism.

Fig. 8 is a view illustrating a modified form of actuating means.

As shown in Fig. 2, there is provided a suitable base or platform 1 mounted and secured to the ground as by means of posts 2 and preferably a suitable case or box 3 is mounted under the platform for containing the operating mechanism. The receptacle is illustrated at 4 having a cover 5 pivoted to the receptacle as at 6.

Associated with the receptacle is an elevating mechanism which, as shown in Figs. 1 and 2, comprises a series of levers pivoted together at their intermediate portion and at their ends in such a manner that by a simple movement there is an extending action. This structure is commonly known as a lazy-tong structure and it will be referred to as such herein. As shown in Figs. 2 and 3 there are two sets of lazy-tongs, one on each side of the receptacle and they are generally illustrated at 10 and 11. Suitably mounted in the base is a cross shaft 12 constituting the fixed end of the lazy-tong structure. As illustrated in Fig. 1 the lazy-tong structure 10 is comprised of a series of levers 13 and 14 pivoted together at their intermediate portions as at 15 and at their ends as at 16. The pivot points 15, however, are located so that some of the lever arms are longer than others. For example, the arms 17 of the levers are longer than the arms 18 so that when the lazy-tong structure is extended the movement given to the can is upwardly and angularly. Thus, the receptacle is moved laterally so that it may overlie a vehicle body. The lazy-tong structure 11 on the opposite side of the receptacle is constructed in the same manner.

The mechanism for controlling the movement of the lazy-tong structure is housed in the covering 3 and is shown in Figs. 6 and 7. There is a worm 20 with an exposed end in the form of a nut or the like 21 adapted to receive a suitable turning tool or wrench 22. The worm structure meshes with the teeth of a worm gear 23 for turning

a main shaft 24 through the means of gears 25 and 26. On this main shaft is a gear 27 and a gear 28 and the teeth of these gears mesh with gears or pinions 29 and 30. The axial extent of gear 29 and 30 exceed that of gears 27 and 28 as shown in Fig. 6. The two lowermost lever arms 17 and 18 have, as shown in Fig. 7, extending segments 35 and 36. The segment 35 joins with arm 18 and its teeth mesh with those of gear 29. The segment 36 joins with lever arm 17 and its teeth mesh with the gear 27. In this manner the direction of oscillation of the levers is made to be opposite, it being understood that the segment 35 engages the gear 29 at a position alongside the gear 27. If, for example, the shaft 24 is rotated clockwise as Fig. 7 is viewed, the arm 17 is rocked counter-clockwise. At the same time the gear 29 is rotated counter-clockwise and the segment 35 and arm 18 are rocked clockwise. This gear arrangement is duplicated for the gears 28 and 30 and the lazy-tong set 11. So it will be seen that by applying the turning tool to the operating piece 21 that the lazy-tong structure may be extended or retracted. A modified form of operator is shown in Fig. 8. In this form a lever 40 is operable on the shaft 19 and the lazy-tong structure advanced or retracted by swinging of the lever. This modified arrangement may be suitable for smaller installations. However, the worm-type of mechanism is irreversible so that the structure, when extended, will remain in extended position.

The receptacle is pivotally mounted to the lazy-tong structure as at 41. This mounting is advantageously a little bit above the center of gravity. On one of the pintles attached to the receptacle is a spring retainer 42 for cooperation with a coil spring 43, one end of which is attached to the retainer at 44 and the other end of which is attached to the lazy-tong structure at one of the fulcrum points, for example, as illustrated at 45. The member 42 is rigid with the container and when the receptacle is in lowered position the spring is more or less wound around the retainer 42.

Mounted on the receptacle is a channel 50, one side of which near the bottom may be cut away as at 51. Near the top of the channel is an opening 52. Adjacent the opening 52 is an angular guide 53. At one of the fulcrum points in the lazy-tong structure, for example, at the point 55 there is a projecting stud 56 designed to cooperate with the channel 50. The spring arrangement and the channel and stud arrangement cooperate to control the tipping action of the receptacle.

The structure operates as follows: In the normal position of repose the receptacle may rest upon the base 1 with the lazy-tong structure collapsed as shown in Figs. 2 and 3. The spring 42 is wrapped upon the retainer; the stud 56 reposes in the upper part of the channel 50 substantially as illustrated in Fig. 5. To elevate the container the operating piece 21 is rotated which may be done by means of a suitable handle or crank 22. This actuates the gearing as shown in Fig. 7 and as previously described, and the lazy-tong structure is extended. As the container is elevated the pivot point 55 and the stud 56 move downwardly relative to the point of connection 41 with the receptacle and, therefore, the stud moves downwardly in the channel 50. At the same time, the spring 43 is stressed. As will be appreciated by reference to Fig. 1, the spring retainer 42 acts as a lever, and the spring places the torque on the receptacle tending to turn it on its mountings 41 in a counter-clockwise direction as Fig. 1 is viewed. However, this cannot occur because the pin 56 lies in the channel 50. When the receptacle reaches about its upper limit, however, the pin 56 comes into alignment with the opening 51 and the receptacle is freed and it is accordingly tipped by the spring to the dotted line position shown in Fig. 1. This discharges the contents into the body of a vehicle which is represented at 60.

Upon reverse movement of the operating handle the lazy-tong structure is collapsed. The stress of the spring is gradually decreased and as the receptacle approaches its lowermost position may gravitate back to its normal vertical position. When this is done the pin 56 is outside the channel 50 but below the angle guide 52. It may be that the receptacle, in gravitating to a vertical position, will cause the opening 52 to move over the pin. For safety purposes, however, and in the event this does not occur, the pin 56 will strike the angle guide 50 and thereby be forced into the channel. Thus, the parts are restored to the positions shown in Fig. 5.

The cover of the receptacle is preferably mounted so that the receptacle is opened by the cover and tips to the dotted line positions shown in Fig. 1. To this end there is a cover operator pivotally secured to the cover as at 61 and pivotally connected at a relatively fixed point 62. The operator is a telescoping structure residing in a rod 63 and a tube 64, the arrangement being such that when the cover is closed all telescoping action is taken up and the end of the member 64 substantially abuts a shoulder 65 on the rod 63. For supporting the mounting 62 there is a sort of rocker arm having a part 70 and a part 72 pivotally mounted as at 73 on one of the lazy-tong levers. A link 75 is pivotally mounted as at 76 on an opposite lazy-tong lever and the link 75 is pivoted to the part 72 as at 77. When the receptacle tips about its pivotal mounting 41 the strut of the cover pivots about the point 62. Since point 62 is removed from the pivot point 41, the hinge 6 of the cover and the point of connection 61 move about different arcs. The link structure 63—64 provides a strut action and causes the cover to swing into an open position as shown by the dotted lines in Fig. 1. Due to the link structure 70—72, and 75, the point 62 remains relatively fixed as regards the pivot point 41. That is to say, the pivot point 62 remains at substantially the same radial distance from the pivot point 41. As the lazy-tong levers collapse, as shown by the dotted lines in Fig. 4, there is a hinging action as at 77 between the parts 75 and 72 and this lever system is worked out to maintain the point 62 at approximately a uniform distance from the center 41. Accordingly, when the receptacle is lowered and gravitates toward normal position the cover will, by gravity, assume a closed position. The cover may be lifted on its hinge with the telescoping parts 63 and 64 sliding relative to each other. The structure comprising the part 63 and 64 may, if desired, be arranged to hold the cover open when refuse is being placed in the container. Such structures are known to those versed in the art of lids and decks and constitutes a refinement which may be made in a commercial structure but which needs no detail description herein.

I claim:

1. An apparatus substantially as described comprising a receptacle, a support, a lazy-tong structure mounted at one end to the support, means pivotally connecting at its other end to the receptacle, means holding the receptacle

against rocking movement on the pivotal connection means operable to extend the lazy-tong structure to elevate the receptacle and means operable to release the holding means for the tipping of the receptacle when elevated to discharge the contents thereof.

2. The structure as described in claim 1, characterized in that the pivots for the intermediate portions of the levers of the lazy-tong structure are positioned so that the lever arms on one side of the lazy-tong structure are relatively long and on the other side are relatively short so that the receptacle when elevated is given a lateral movement whereby it may be positioned over a transporting vehicle.

3. An apparatus substantially as described comprising a receptacle, a support, a lazy-tong structure mounted at one end to the support, means pivotally connecting the receptacle to the other end of the lazy-tong structure at a point above the center of gravity of the receptacle, means operable to extend a lazy-tong structure to elevate the receptacle and means conditioned by the elevating movement and operable when the receptacle is elevated to tip th same for discharge of the contents thereof.

4. An apparatus substantially as described comprising a receptacle, a support, a lazy-tong structure having a plurality of levers pivoted together and mounted at one end to the support, means pivotally connecting the lazy-tong structure at its other end to the receptacle, means operable to extend the lazy-tong structure to elevate the receptacle, a spring interconnecting the receptacle and a part of the lazy-tong structure which is stressed as the lazy-tong structure is extended and tends to tip the receptacle on its mounting and means interconnecting the receptacle and the lazy-tong structure for preventing the tipping of the receptacle, said last named means being releasable substantially upon complete elevation of the receptacle.

5. The structure as described in claim 4 characterized in that the means interconnecting the receptacle and the lazy-tong structure comprising a rail on the receptacle and a stud on the lazy-tong structure for engaging the rail, said stud adapted to run off the rail when the lazy-tong structure is substantially fully extended.

6. The structure as described in claim 4 characterized in that the means interconnecting the receptacle and the lazy-tong structure comprising a rail on the receptacle and a stud on the lazy-tong structure for engaging the rail, said stud adapted to run off the rail when the lazy-tong structure is substantially fully extended, and an angular guide member for engaging the stud as the lazy-tong structure is substantially collapsed to move the same into cooperative relationship with the rail.

7. A structure as described in claim 4 characterized in that the means for preventing tipping of the receptacle comprises a channel mounted upon the receptacle, a stud projecting from a pivot of the lazy-tong structure for operation in the channel, said channel terminating near the bottom of the receptacle for movement of the stud out of the channel for tipping of the receptacle and an angular guide adjacent the top of the channel for engaging the stud when the lazy-tong structure is substantially collapsed for moving the stud into the channel.

8. An apparatus substantially as described comprising, a receptacle, a support, a lazy-tong structure mounted at one end to the support, means pivotally mounting the receptacle to the other end of the lazy-tong structure, means operable to extend the lazy-tong structure to elevate the receptacle, means for tipping the receptacle when elevated for the discharge of the contents thereof, a cover pivotally mounted to the receptacle, link means pivotally connected to the cover, means connecting the link means to the lazy-tong structure at a point removed from the pivotal mounting of the receptacle and arranged to swing the cover to open position as the receptacle tips.

9. An apparatus substantially as described comprising a receptacle, a support, a lazy-tong structure mounted at one end to the support, means pivotally mounting the receptacle to the other end of the lazy-tong structure, means operable to extend the lazy-tong structure to elevate the receptacle, means for tipping the receptacle when elevated for the discharge of the contents thereof, a link comprising telescoping members, one of which is connected to the cover, means connecting the other telescoping member to the lazy-tong structure at a point removed from the pivotal mounting of the receptacle, the telescoping action being operable for the opening of the cover when the receptacle is standing at rest and operable as a strut when the receptacle tips for opening the cover.

10. The structure as described in claim 9 characterized in that the means for mounting the telescoping link member to the lazy-tong structure comprises two links, each pivoted to an oppositely disposed lever in the lazy-tong structure and pivoted together with one of the links having an extending arm pivotally connected to one of the said telescoping members.

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