March 18, 1947. H. LINDE 2,417,696

REFUSE COLLECTING CONTAINER

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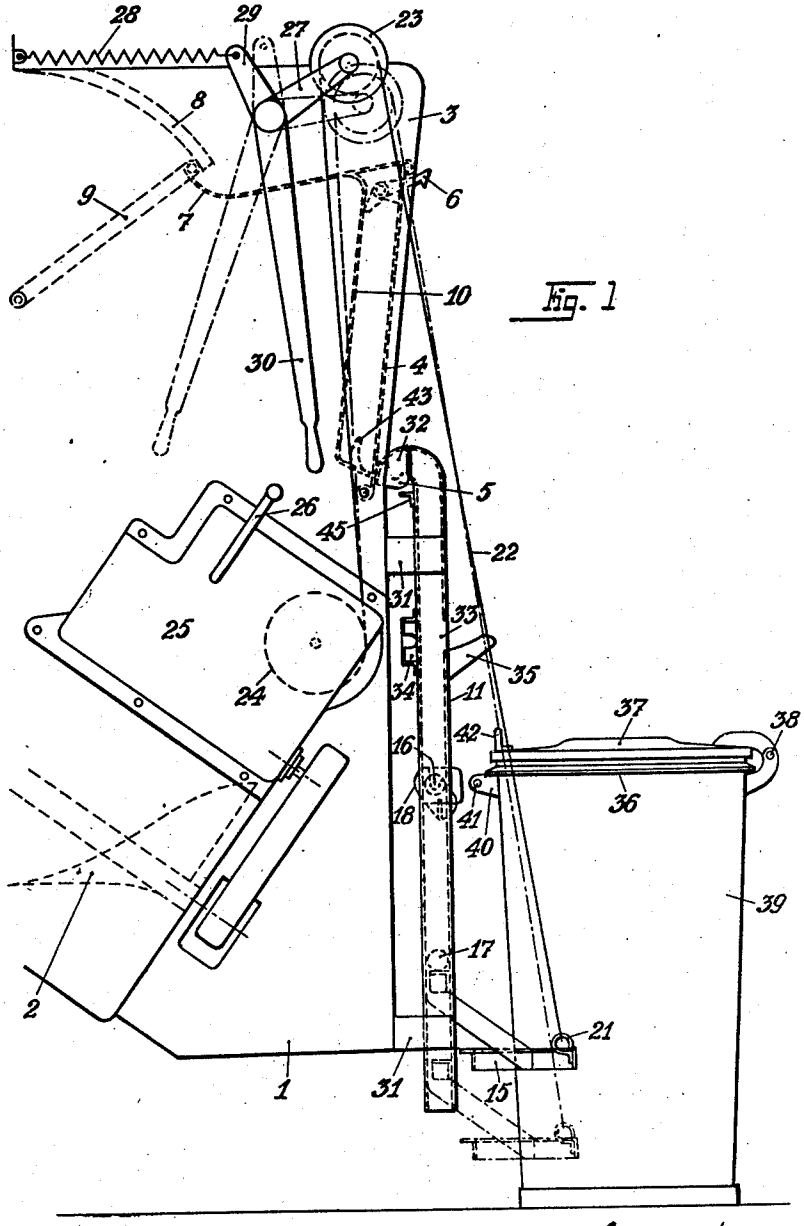


Fig. 1

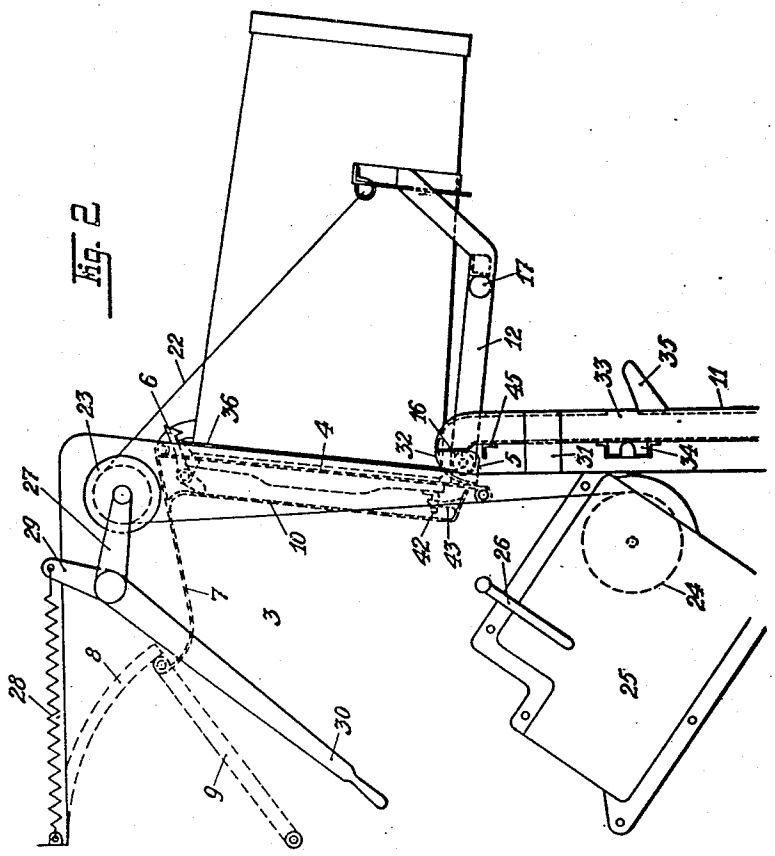
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Fig. 2



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Fig. 3

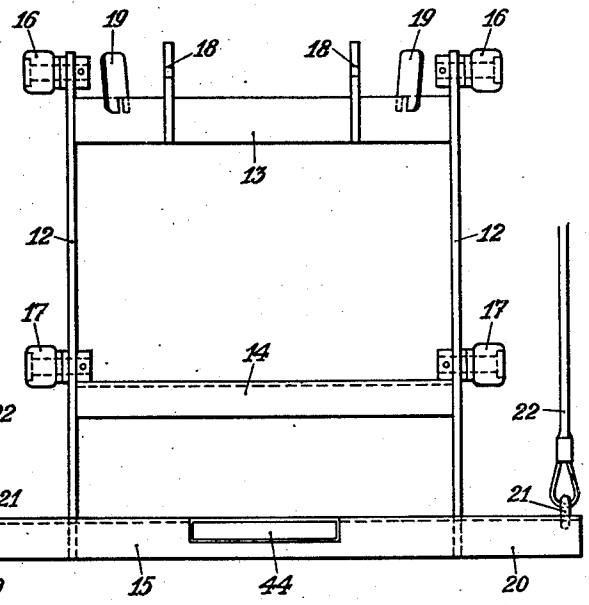


Fig. 4

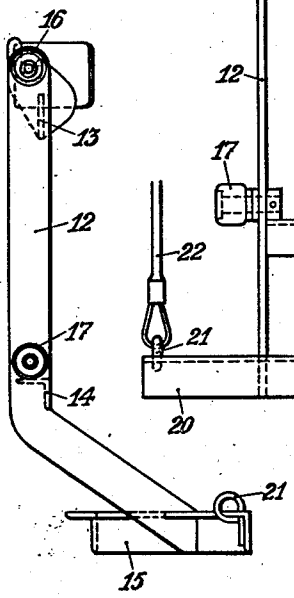
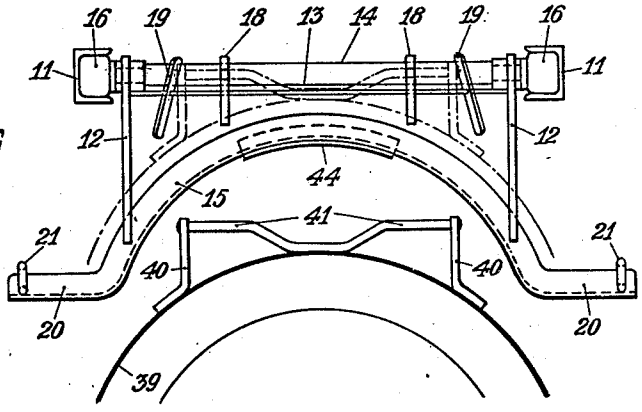


Fig. 5



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REFUSE COLLECTING CONTAINER

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In Sweden March 4, 1944

7 Claims. (Cl. 214—67)

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The invention relates to a refuse collecting container which may be mounted on a vehicle and which preferably is provided with means for dustless discharge of the refuse bins or cans into the container.

One object of the invention is to obtain a device for emptying the bins essentially by mechanical means and with a minimum of hand work.

Another object of the invention is to permit the coupling of the refuse bin to a hoisting and tilting device without lifting the bin from the ground or a special basis supporting the bin from below.

The invention consists in the construction and novel combination and arrangement of parts hereinafter described, illustrated in the accompanying drawings and pointed out in the claims hereunto appended.

One embodiment of the invention is shown in the accompanying drawings in which:

Fig. 1 is a side view of the rear part of a refuse collecting vehicle with an emptying device and a refuse bin ready for discharge.

Fig. 2 is a side view of the same device in another operating position with the bin in an uncompletely tilted position.

Fig. 3 is a front view of the carrier of the emptying device.

Fig. 4 is a side view and

Fig. 5 a top view of the same carrier.

The device for emptying the bins into the receiver is arranged at the rear end of a collecting vehicle 1, which in its lower part has a feed screw 2 by which the refuse received through an emptying hood is compressed into the collecting container of the vehicle. The emptying hood comprises a plate 4 hinged at its lower edge between two side walls 3 and having a discharge opening corresponding to the top of the bin. The plate 4 has hooks 5 and 6 for coupling the bin together with the plate 4. This plate 4 is along its upper edge hingedly connected to a movable cover plate 7 which at its inner end is hinged to the upper ends of two arms 9, the lower ends of which are journalled in the side walls of the emptying hood and serve to guide the inner edge of the movable cover plate 7 along the fixed cover plate 8 of the emptying hood. A lid 10 fixed to the movable cover plate projects downwards and serves to close the opening of the plate 4 from the inside. Two essentially vertical and U-formed guide rails 11 are secured to the rear of the vehicle below the emptying hood with their open sides facing each other. The wheels of a carrier, shown more in detail in Figs. 3–5, are guided in these rails. The carrier comprises two side portions 12 and two transverse portions 13 and 14 forming a frame. The side portions 12 are bent outwardly below the lower transverse portion 14 and have their lower ends connected to an arched sustaining bar 15 of angle iron. Each of the side portions 12 is on its outside provided with two wheels having preferably rubber coated running surfaces and forming together an upper pair of wheels 16 and a lower pair of wheels 17. At equal distances from the side portions 12 the upper transverse portion 13 has upwardly open coupling hooks 18 and at somewhat lesser distances from the side portions two upwardly and outwardly diverging guiding plates 19. The notches of the coupling hooks are preferably disposed coaxially with the upper pair of wheels 16. The outwardly bent ends 20 of the sustaining bar 15 are provided with eyes 21 for fastening the ends of hoisting lines 22 connecting the carrier with the hoisting mechanism.

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As shown in Fig. 1, the hoisting lines 22 run from the eyes of the carrier upwards over guide rollers 23 and further downwards to line drums 24 disposed on each side of the collecting container and adapted to be rotated in one direction or the other by means of a gear and coupling device 25 operated by a hand lever 26. The line drums and the feed screw 2 are preferably driven from the engine of the vehicle by a transmission gear not shown. The rollers 23 are journalled on the ends of two arms 27 mounted on a common shaft and are drawn upwards by a spring 28 acting on an arm 29 secured to said shaft which is preferably on the same side of the vehicle as the lever 26 provided with a lever 30 arranged to be easily reached by the person in charge of the device. By the operating of this lever the bin can also be shaken in the tilted position in the emptying hood.

The guide rails 11 are fastened to the rear of the collecting vehicle 1 by means of supports 31. Their upper ends are bent towards the vehicle about 90° with very little radius. In direct continuation of these bends of the guide rails are provided bent guide portions 32 fastened to the plate 4 at the same level as the coupling hooks 5. These are arranged to be introduced between the coupling hooks 18 and the guide plates 19 on the carrier in its upper position. At a distance from the bent upper ends of the guide rails which distance corresponds to the space between the upper and the lower pair of wheels the outer flanges of both rails are cut out to form openings 33 permitting the lower pair of wheels to swing outwards and upwards from the rails when the

upper pair of wheels reaches the upper bent ends of the rails. The parts of the inner flanges of the rails facing the openings 33 are also cut away and replaced by appropriate buffers, preferably rubber plates 34. A guiding abutment 35 having an upper arched guiding edge projects from the lower edge of the openings 33. As clearly shown in Fig. 1 the refuse bin is around its mouth provided with a reinforcing ring of angle iron, the outstanding flange 36 of which serves as a coupling member for the connection of the bin with the upper coupling hook 6 of the emptying hood. Opposite to the hinge 38 of the bin lid 37 the side wall of the bin is provided with a suspending clamp formed of two projecting flanges 40 and a bolt 41 between them. In order to increase the strength of the clamp the bolt may be bent inwards at the middle of its length and there fastened to the side wall of the bin by welding. Directly above the suspending clamp the bin lid is provided with a handle 42, which cooperates with a projection 43 on the lid 10 of the emptying hood when the bin is tilted. The hoisting device has a preferably automatic uncoupling mechanism (not shown), which disconnects the line drum from the driving mechanism when the carrier reaches its highest and its lowest position.

The device as described works as follows.

In the lowest position of the carrier the coupling hooks 18 are on the same level with or somewhat higher than the clamp 41 of the bin. For coupling the bin and the carrier together the last one is lowered preferably by pressing down the sustaining bar 15 with the foot. The carrier is thereby lowered by stretching the spring 28 e. g. into the position shown by mixed lines in Fig. 1. When the coupling hooks thus have been lowered below the suspending clamp 41, the bin is inclined towards the vehicle to permit the coupling hooks 18 to engage the clamp 41 when the carrier is released and moves upwards under the action of the spring 28. By cooperation between the side flanges 40 of the clamp and the guide plates 19 the clamp is exactly positioned relatively to the carrier. To illustrate this the coupling position of the clamp is indicated in mixed lines in Fig. 5. By shifting the lever 26 of the driving mechanism the carrier is thereafter hoisted along the guide rails and the bin is lifted by its clamp, the lower part of the bin resting against the arched portion of the sustaining bar 15. The impact of the bin against the bar 15 is damped by a rubber block or plate 44 disposed preferably in the middle of the arched portion of the bar (Figs. 3 and 5). When the upper pair of wheels of the carrier reaches the upper bent ends of the rails 11, they are guided inwards and prevented from further upward displacement. Simultaneously the lower pair of wheels has reached the level of the openings 33. The pulling strain exerted by the hoisting lines causes the lower pair of wheels to swing outwards and upwards to the approximately horizontal intermediate position shown in Fig. 2, in which the bin is coupled together with the emptying hood. By the tilting motion of the carrier the upper pair of wheels is guided inwards into the guide portions 32 and through these inwards and downwards, until the parts of the suspending clamp 41 lying between the coupling hooks 18 and the guide plates 19 on the carrier engage the coupling hooks 5 on the plate 4 of the emptying hood. Simultaneously the handle 42 on the bin lid engages the projection 43 in the lid 10 of the emptying hood. The upper coupling hook 6 of the emptying hood is held open by cooperation with the lid 10 as long as the lid closes the opening of the plate 4. The continued pulling strain in the lines causes the carrier and the bin to be tilted together with the plate 4 around its lower edge, while the lid 10 is swung inwards and causes the lid 37 of the bin to swing upwards and leave free passage for the refuse to be discharged through the emptying hood. As soon as the lid 10 is swung inwards from the plate 4 the coupling hook 6 falls down and catches behind the flange 36 of the bin thus coupling this together with the plate 4. When the device has reached its uppermost position in which the bin is fully tilted, the hoisting mechanism is automatically stopped. In order to shake away such rests of refuse, that may adhere to the inner walls of the bin, the bin can be subjected to repeated shocks by moving the hand lever 30 to and from. Thereafter the hoisting mechanism is operated for lowering the bin. In order to facilitate the beginning of the return motion the plate 4 may be acted upon by a spring not shown in the drawings. When the bin has reached the intermediate position shown in Fig. 2, the upper coupling hook 6 is lifted off by cooperation with the lid 10, and the lowering of the bin and the carrier is free to continue. Shortly afterwards the side portions 12 of the carrier are pressed against an angle iron 45 fixed transversely on the guide rails 11, so that the upper pair of wheels of the carrier is lifted off the coupling hooks 5 when the carrier turns downwards around the edge of the angle iron 45. The guiding abutment 35 prevents the upper pair of wheels 16 from gliding down in the guide rails 11, before the lower pair of wheels 17 has re-entered the guide rails through the openings 33. In order to prevent a hard impact of the lower pair of wheels against the inner flanges of the guide rails, these are provided with the buffer means 34 facing the openings 33. When the carrier thereafter has reached its lowest driving position and the bin is standing on the ground, the carrier is lowered with the foot just enough to disengage the suspending clamp 41 from the coupling hooks 18 of the carrier, whereafter the empty bin can be taken away. The whole hoisting and emptying process is by this device effected without other manual handling of the bin than a light inclining of the bin towards the vehicle, respectively a corresponding displacement outwards of the emptied bin. The bin needs not be lifted upon a hoisting platform on the carrier and is by the described simple suspending device automatically placed in correct relation to the carrier and the coupling means of the emptying hood respectively.

By the resilient suspension of the carrier not only a very simple and easy coupling of the bin is attained, but even bins of different height may be used with the same emptying device.

The present invention is not considered to be limited to the embodiment described and shown. Other means for suspending the bin on the carrier may be used, e. g. the handles of the bin. Other emptying devices and means for coupling the bin to the emptying device may also be used in connection with the coupling of the bin to the carrier according to the invention, and hooks 5 on the emptying hood for the coupling of the bin may also be unnecessary. The device according to the invention may be used in connection

with other collecting receivers than vehicles, e. g. with stationary installations for the discharging of materials transported in bins or cans.

I claim:

1. In a refuse collecting container having a device for emptying dust bins thereinto, said device comprising an elevator having a carrier and guide rails in which the carrier runs and having upwardly open hooks, said guide rails extending downwards sufficient to allow said open hooks to be introduced from below into corresponding coupling members on a dust bin on the ground, and means for hoisting up the carrier into a tilting position and for tilting the carrier together with the bin.

2. In a refuse collecting container having a device for emptying dust bins thereinto, said device comprising an elevator having a carrier and guide rails in which the carrier runs and having upwardly open hooks, said guide rails extending downwards sufficient to allow said open hooks to be introduced from below into corresponding coupling members on a dust bin resting on the ground, and projecting guiding surfaces on the carrier mounted on each side of the hooks and adapted to guide the coupling members of the bin into a correct lateral position above said hooks.

3. In a refuse collecting container having a device for emptying dust bins thereinto, said device comprising an elevator having a carrier and guide rails in which the carrier runs and having upwardly open hooks for engaging from below corresponding coupling members on a dust bin resting on the ground, a hoisting mechanism, and a resilient connection between said mechanism and the carrier permitting said carrier to be resiliently lowered in the guide rails.

4. In a refuse collecting container having a device for emptying dust bins thereinto, said device comprising an elevator having a carrier and guide rails in which the carrier runs and having upwardly open hooks adapted to engage from below corresponding coupling members on a dust bin resting on the ground, and a hoisting mechanism comprising a hoisting line connecting an actuating mechanism to the carrier and passing over a guide wheel journalled on a spring loaded rocking lever.

5. In a refuse collecting container having a device for emptying dust bins thereinto, said device comprising an elevator having a carrier provided with coupling members for connecting said carrier with a dust bin supported from below and a hoisting mechanism having a guide wheel for a hoisting line, said guide wheel being journalled on a spring-loaded rocking lever, and means for manually operating said lever from a place near said carrier.

6. In a refuse collecting container having a device for emptying dust bins thereinto, said device comprising an elevator with a carrier having coupling members for connecting said carrier with a dust bin and two pairs of wheels running in substantially vertical, U-shaped rails, said rails having their upper ends curved to form a limit stop for the upper pair of wheels and at a distance from said ends, corresponding to the distance between the pairs of wheels, an opening permitting the lower wheels to swing out when the carrier is tilted, and said limit stops being so located in relation to a dustless emptying hood that the bin is automatically coupled to said hood on tilting.

7. In a refuse collecting container according to claim 6, characterized in that a guiding abutment projects from the lower edge of said opening to secure the re-entrance of the lower wheels of the carrier into the guide rails.

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