United States Patent

[11] 3,613,569

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[21] Appl. No. **876,883**
[22] Filed **Nov. 14, 1969**
[23] **Division of Ser. No. 703,995, Feb. 8, 1968, Pat. No. 3,507,410**
[45] Patented **Oct. 19, 1971**

[73] Assignee **Dempster Brothers, Inc. Knoxville, Tenn.**

[54] STATIONARY PACKER ASSEMBLIES

6 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** **100/229,** 100/215, 100/245, 100/269
[51] **Int. Cl.** **B30b 1/32**
[50] **Field of Search** 214/41; 100/229, 179, 240, 245, 214, 215, 269

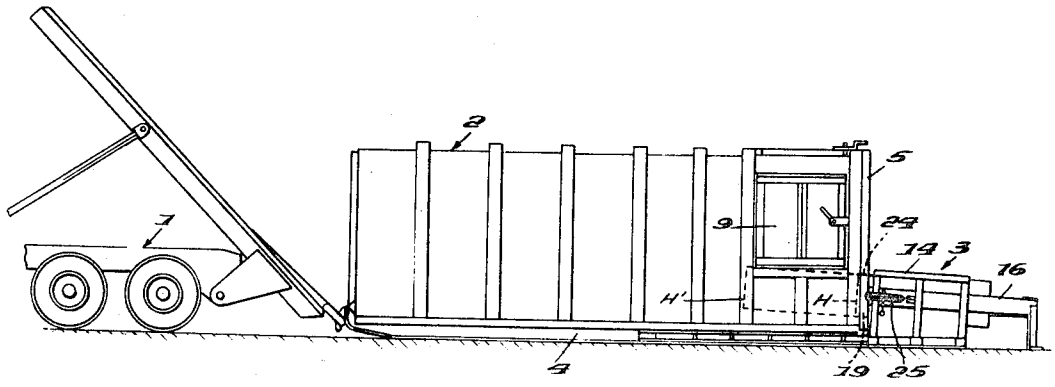
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ABSTRACT: A refuse packing and transporting assembly wherein the refuse is placed directly in a transport container while the container is connected with a packer device which is operated to compress the refuse therein. The packer device comprises a relatively simple frame structure mounted in position to have the transport container brought into juxtaposition thereto with an opening in the end of the transport container into and through which a head in the packer operates to compress the refuse in the container after deposit directly into the container. After a suitable quantity of refuse has been packed in the container, the latter may be disconnected from the packer and hauled away for discharging the refuse therefrom.



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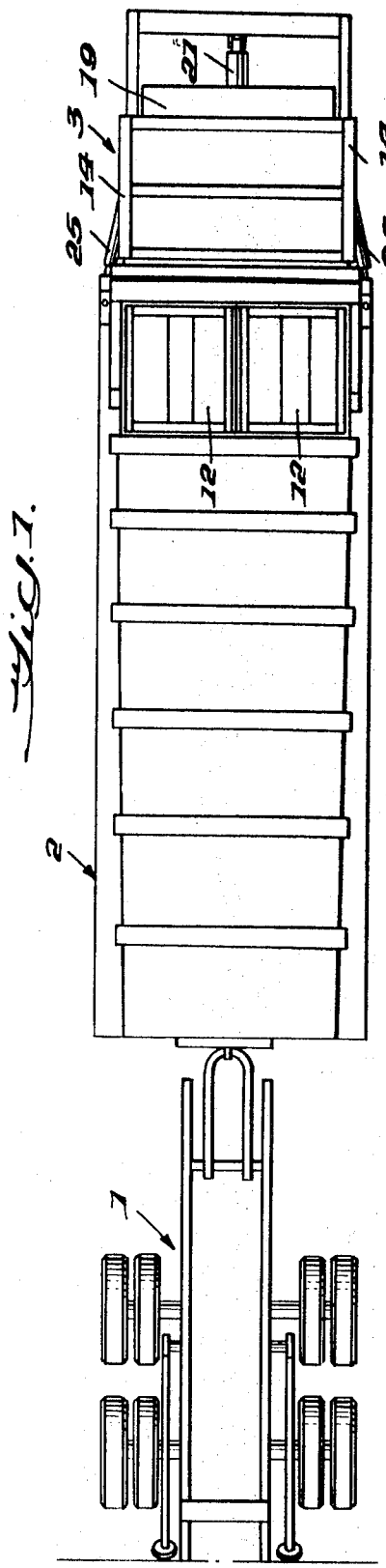


Fig. 1.

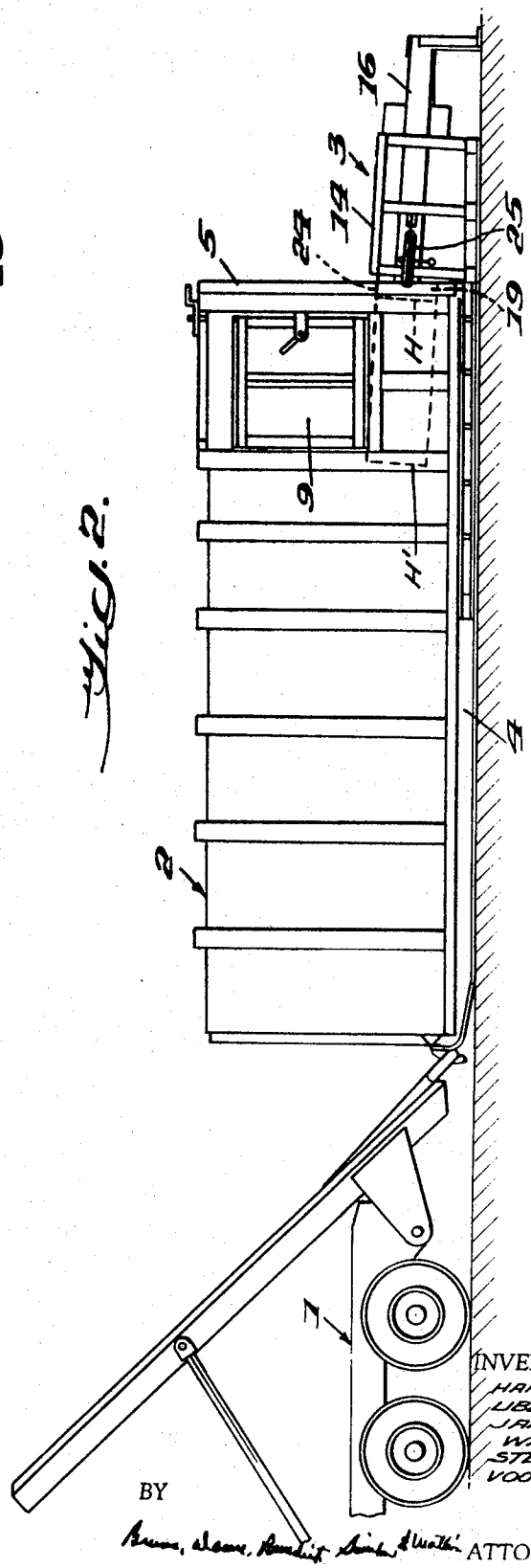


Fig. 2.

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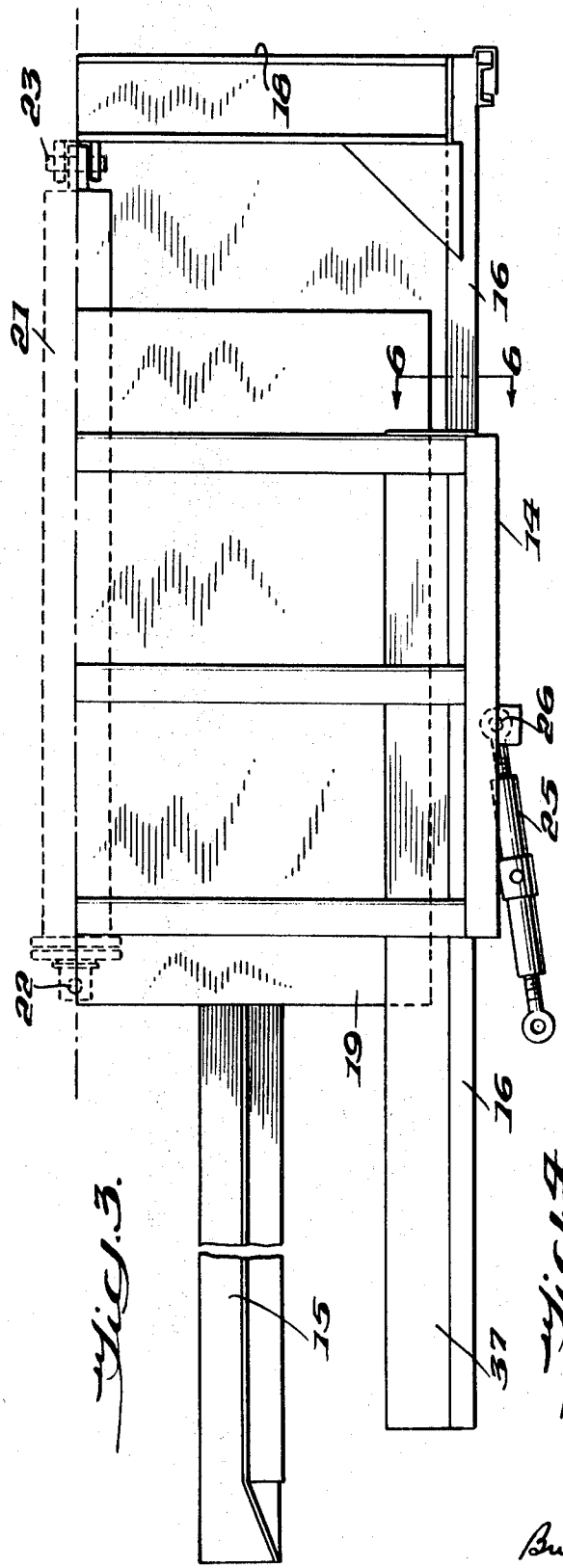


Fig. 3.

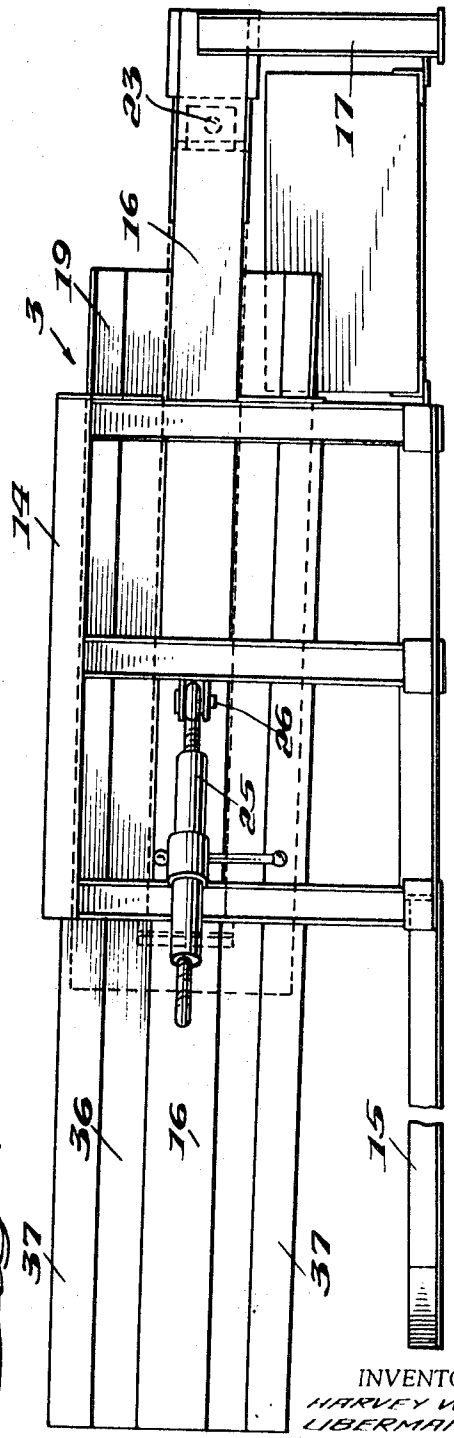


Fig. 4.

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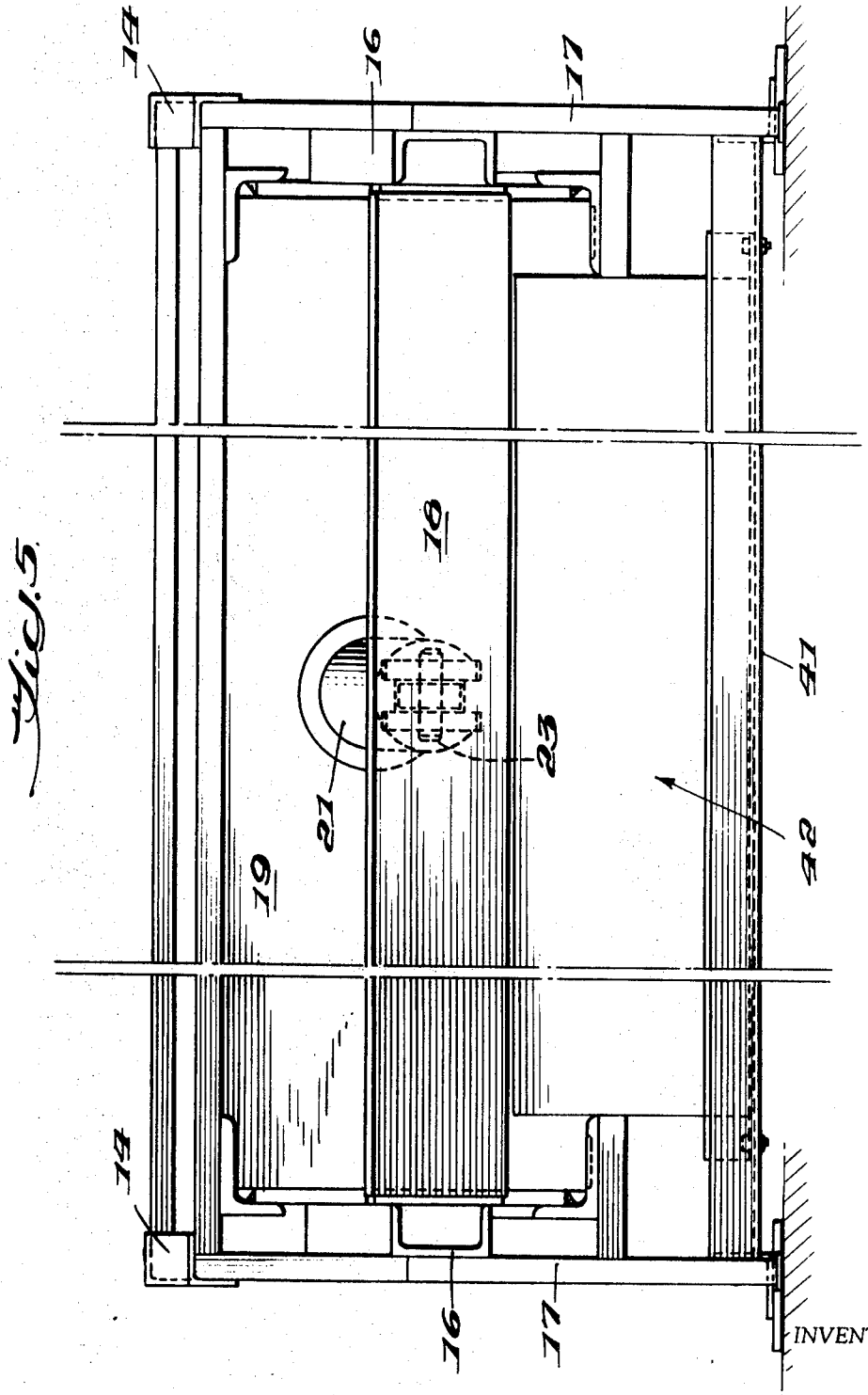


Fig. 5

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Fig. 6.

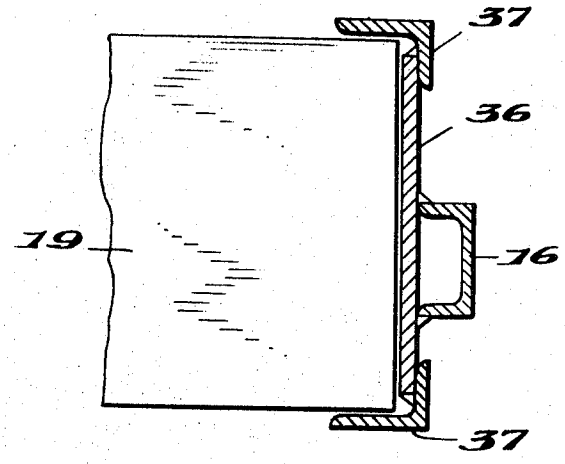
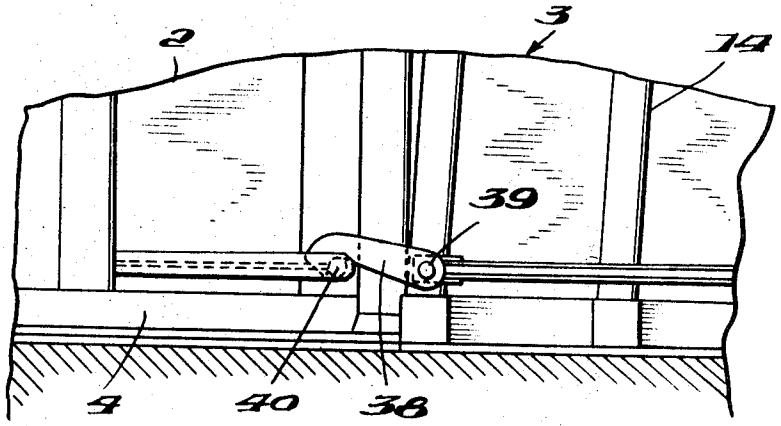


Fig. 7



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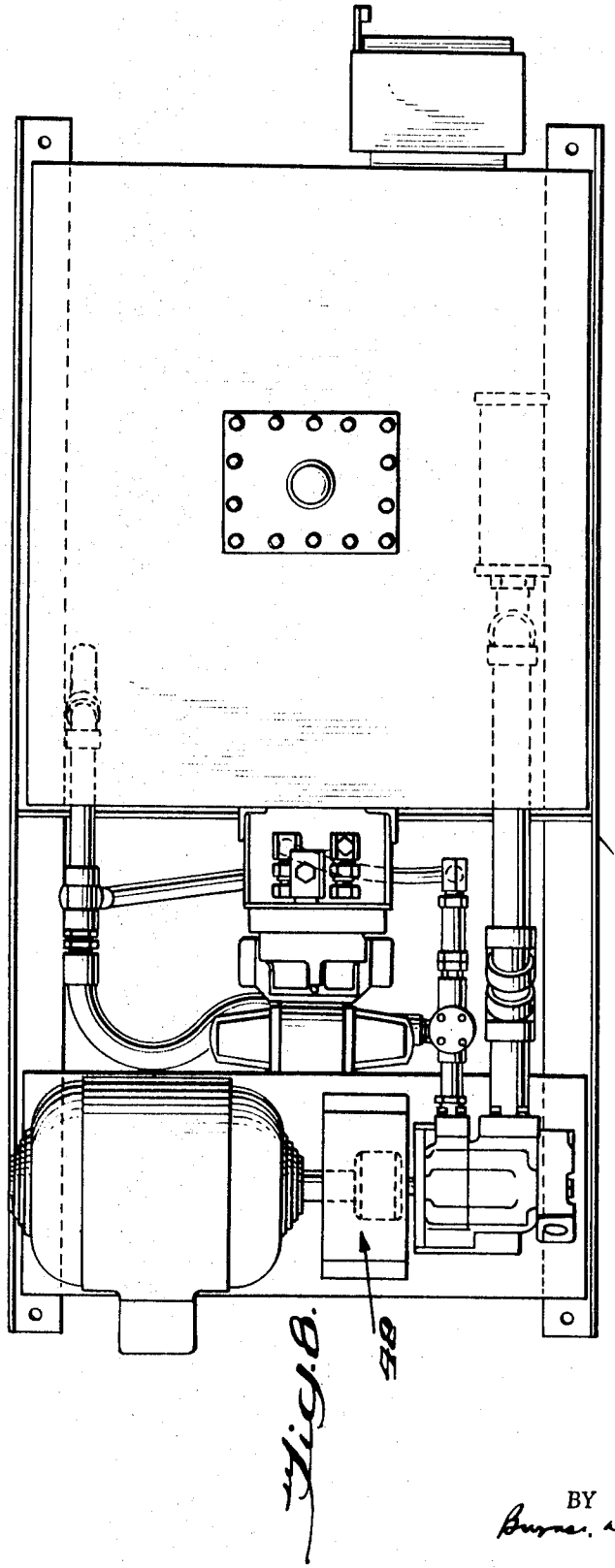


Fig. 8.

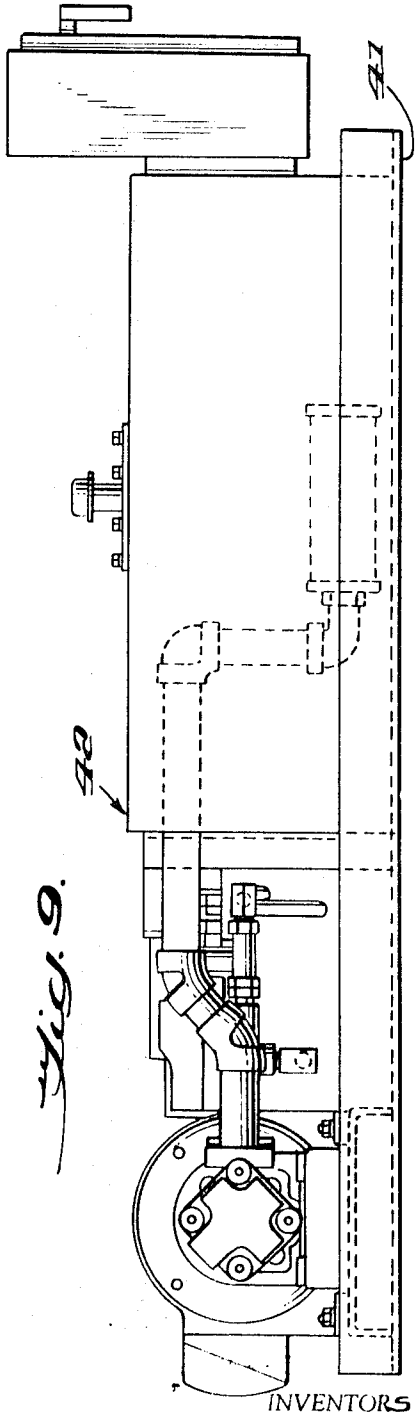


Fig. 9.

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STATIONARY PACKER ASSEMBLIES

CROSS REFERENCES TO RELATED APPLICATIONS

This application is a division of Application Ser. No. 703,995 filed Feb. 8, 1968 and which issued as Pat. No. 3,507,410 on Apr. 21, 1970.

SUMMARY OF THE INVENTION

This invention relates to improvements in Stationary Packer Assemblies and, more particularly, to devices for compacting refuse in a transport container after deposit of the refuse in the container.

It has been provided heretofore that refuse would be dumped into a stationary hopper in the top of a packer from which it would be discharged under pressure into a transport body or container. An example thereof is illustrated in French et al. Pat. No. 3,229,622, Jan. 18, 1966.

A packer system which includes a stationary hopper not only is complex and expensive, but adds considerable overall length to the packer assembly. Moreover, it is difficult to keep clean, especially when waste foodstuffs are dumped into the hopper and these must be washed down frequently to prevent obnoxious odors.

One object of this invention is to simplify and improve the construction of stationary packer assemblies for this purpose to enable these to be constructed at less cost and with less complexity and to require a substantial reduction in overall space for the use thereof.

Another object of the invention is to provide for the dumping of the refuse directly into the transport container and the utilization of the packer to compress the refuse in the container itself, thereby eliminating the need for and the use of a hopper as a part of the packer assembly.

Still another object of the invention is to provide a secure connection between the transport container and the packer assembly and the operation of the packer head through a sufficient distance into the transport container to effect a compressing action to the refuse as it is discharged into the container, the head operating through the area in which the refuse is directed so as to act on the refuse in that area.

These objects may be accomplished, according to one embodiment of the invention, by providing a suitable transport container such as may be picked up on a vehicle for transport to a remote point for dumping and may be of the order of a truck body. Mounted in a stationary position is a packer assembly which is adapted to have the transport container brought into juxtaposition thereto and to be coupled therewith.

The transport container not only has an opening in the rear end thereof through which the packer operates, but it also has one or more filling openings about the sides thereof and may include the top for directing the refuse into the transport container in the path of the packer head on the packer assembly. The packer head operates through the area of discharge in the transport container so as to effect substantial compaction of the refuse in the container as it is discharged therein.

The packer head is supported by a suitable framework and is operated by a power cylinder to effect operation thereof with force required for compacting the refuse. The structure does not include a hopper which has been eliminated from prior packer assemblies.

BRIEF DESCRIPTION OF DRAWINGS

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

FIG. 1 is a top plan view of a combined transport and packer assembly in coupled relation;

FIG. 2 is a side elevation thereof;

FIG. 3 is a partial plan view of the packer assembly;

FIG. 4 is a side elevation thereof;

FIG. 5 is an end elevation thereof;

FIG. 6 is a detail cross section of the packer head guide;

FIG. 7 is a side elevation of an assembly showing a modification of the body connection;

FIG. 8 is a plan view of a power unit, detached, for the packer; and

FIG. 9 is a side elevation thereof.

DETAILED DESCRIPTION OF DISCLOSURE

Referring to FIGS. 1 and 2, we have shown a transport vehicle, which is designated generally by the numeral 1, connected at the front end of a transport container 2 and the latter, in turn, having its rear end coupled with a packer assembly, generally indicated at 3.

The transport vehicle 1 is provided with means for loading and unloading the transport container 2. This container handling mechanism is illustrated and described more in detail in Pat. No. 3,107,020, dated Oct. 15, 1963. Accordingly, the frame structure of the container 2 preferably includes runners 4 extending lengthwise of the container and may also be provided with rollers, if desired, for effecting such lengthwise movement onto and off the vehicle 1. This underframe structure is indicated generally at 4 in FIG. 2 and preferably includes means for detachably moving the container onto and off the vehicle such, for example, as step-by-step mechanism of the character described in the aforesaid Pat. No. 3,017,020.

At its rear end the container 2 is substantially open throughout the area thereof and is provided with a closure door 5 of substantially the same area as said rear end. The door 5 is hinged to the body of the container 2 and is capable of being latched in closed position.

The container 2 is also provided with one or more filling openings adjacent the rear thereof for the deposit of refuse into the rear end portion of the container in a region immediately forward of the rear end of the container. These filling openings may be provided in one or both opposite sides, including the top, and should be provided with doors for closing such openings.

As indicated in FIG. 2, side filling openings are shown, provided with hinged closure doors 9 therefor. One or more filling openings may be provided in the top of the body container 2. Hinged closure doors 12 are provided for the top openings.

The packer assembly 3 is shown more in detail in FIGS. 3 to 5. It includes a frame, generally indicated at 14, which is connected with track members 15 spaced apart to accommodate thereon the runners 4 of the transport container 2 when the latter is brought into juxtaposition with the packer assembly.

At each opposite side of the frame 14 is a channel-shaped beam 16 having its intermediate portion secured rigidly to and supported by the frame 14 and projecting forwardly and rearwardly therefrom. The rear end portions of the beams 16 are supported by upright standards 17. These beams are rigidly connected together at their rear ends by a cross beam 18 (see FIGS. 3 and 5).

Secured to the frame 14 and to the beams 16 are opposite guide plates 36, supported at the upper and lower edges thereof by angle bars 37. These parts 36 and 37 form guides at opposite sides for a compaction head 19 which extends in bridging relation between the guides at opposite sides of the frame 14. The guide plates 36 and angle bars 37 extend forwardly from the frame 14 a substantial distance sufficient to project through the area of deposit in the transport container 2.

The head 19 is mounted for reciprocating movement by a hydraulic cylinder, generally indicated at 21, pivotally connected at one end, at 22, by a suitable pin with the forward end of the head 19, and at the opposite end the cylinder 21 is pivotally connected at 23 with the crossmember 18 so as to allow some vertical flexibility of the head 19.

The container 2 is adapted to be brought into juxtaposition with the packer unit 3, as shown in FIG. 2, so as to allow the head 19 to reciprocate through an opening 24 provided in the lower portion of the door 5 of the container 2. The relation of the head 19 to the frame 14 is such that the head normally projects forwardly therefrom so that upon movement of the container 2 into position for coupled relation therewith, as

shown in FIG. 2, the head 19 may be reciprocated across the area of deposit of material inside the container. In its retracted position, the forward end of the head will be approximately flush with the inside rear door of the container.

Provision should be made for detachably coupling the container with the packer unit. One form of lock device for this container is shown in FIGS. 1, 2, 3 and 4. This form involves coupling links 25 for this purpose, pivoted at 26 on each opposite side of the frame 14. Each of the coupling links 25 has an eyelet at the opposite end thereof, to be connected by a suitable pin with the container 2 in secure juxtapositioned relation. This coupled relation is capable of being tightened to effect the secure connection therebetween.

Another form of lock device that may be used, if desired, between the container 2 and the packer 3 is illustrated in FIG. 7. This involves one or more hooks 38 on each opposite side of the equipment pivoted at 39 to the frame 14 in position for hook engagement with a pin 40 on a side of the container 2. These hooks 38 may be operated automatically or manually for engagement.

The frame 14 and supporting standards 17 are constructed to receive therein a subframe 41 suitably secured to the frame and standards. This subframe 41 is a unitary subframe which serves to support a removable power unit, generally indicated at 42 in FIGS. 8 and 9. This self-contained power unit 42 supplies hydraulic power to the cylinder 21 and conserves space by being located under the machine, although it may be located remote therefrom if preferred. By the utilization of a self-contained power unit the substitution or revision of the components of the unit may be varied as desired.

During normal use, the container 2 and packer 3 are connected together, as shown in FIGS. 1 and 2, but the vehicle 1 is separated and disconnected therefrom. In such use, the refuse is placed in the container 2 through one of the openings, such as a side or top, and the cover door thereof should then be closed. The compaction head 19, which is normally in the retracted position indicated at H in FIG. 2, reciprocates through the area of deposit of refuse to the projected position shown at H' in FIG. 2, entirely across the area of deposit of refuse so as to move all of the refuse out of this area and to compact it forwardly in the container 2. The area of the compaction head 19 is such that it substantially covers the transverse width of the container 2 at the inside thereof and by thus operating through the area of deposit of refuse, this head will effect substantial compaction therein.

After a desired quantity of refuse has been placed in the container 2 and it is desirable that the container be transported to a suitable point for discharge of the refuse, the vehicle 1 may be brought into connected relation therewith, as indicated in FIGS. 1 and 2. The connecting links 25 should then be disconnected, if used or the hooks 38 disconnected at 40, to allow the container to be separated and removed from the packer unit. The container will then be moved by the vehicle onto the latter for transporting to a remote point. If desired, the opening at 24 may be covered during this removal by the provision of a suitable cover thereover.

After dumping the contents from the container, the latter may be brought back to the point of filling and re-connected to the packer unit or taken to another packer unit as desired. It is a relatively simple matter to slide the container along the tracks 15 into coupled relation with the packer unit when it is necessary merely to connect the couplings 25 or hooks 38, and with the packer head 19 retracted in the opening 24 so as to have the unit in operative relation.

This packing system is essentially enclosed when the doors in the container are closed. This is contrasted from the typical stationary packer assembly having a charging box where, if the packer head is left in a retracted position, there is an opening into the rear of the container through the charging box through which odors may emanate, material can blow or persons could enter the container, possibly endangering them. None of this is possible, however, according to this invention because the packer head, in its retracted position, effectively closes the opening into the container and there is no charging box to expose undesirable portions of the packer.

The charging area is not a part of the packer, but is confined within the container. Thus, it is easier to keep it in a relatively clean condition since this area is essentially the container floor. When the container is pulled away from the packer, there is little, if any, structure that can retain refuse or would require cleaning in a system handling food waste, for example, or other contaminating materials.

The short length of the machine in comparison with its displacement makes for simplicity of construction and inexpensive manufacture. The fact that the total head displacement is within the container eliminates extensive travel distance from the overall system dimension which reduces appreciably the packer head stroke as compared with the conventional stationary packer.

The packer head and supporting structure therefor is mounted in an elevated position, as shown in FIG. 4, to allow clearance beneath the frame and guides especially when the container is pulled away from the packer. This makes it easy to clean and aids materially in keeping the entire packer assembly free of contamination and waste and from objectionable materials.

This provides a short overall system, as compared with conventional packer systems that include a hopper as used heretofore. It is completely enclosed, inasmuch as the refuse is discharged directly into the container, which is then closed. A relatively clean, permanent installation can be obtained because there is no charging hopper which must be cleaned frequently, especially when waste foodstuffs are involved, to prevent obnoxious odors.

The system is capable of variable loading arrangements, either from the top of the container or from the side or, if desired, through an opening at the rear, above the packer. A simple and inexpensive power unit is provided which permits installation in any 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 set forth in the claims.

We claim:

1. A stationary packer unit comprising a supporting frame adapted to abut at a forward end with a container, guides on opposite sides of the frame extending lengthwise thereof appreciably beyond the forward end of said frame to be disposed within the container when the frame is in abutting relation therewith, a packer head mounted on the guides, and means for reciprocating said head between positions with the front end of the head at the forward end of the guides thereof and located forwardly of the frame within the container and a retracted position of the head within the frame, said packer head always being positioned so as to preclude the entry of refuse into said container through said packer unit and whereby all refuse to be compacted is placed into said container through openings therein other than that opening through which the packer head reciprocates.

2. A stationary packer unit according to claim 1, including a power cylinder connected with the forward end of the packer head and with the rear end of the frame for reciprocating said head on the guides.

3. A stationary packer unit according to claim 2, including mounting means for the packer head in the guides allowing vertical flexibility of the head relative to the guides, and the connection of the rear end of the cylinder with the frame being movable about a horizontal axis.

4. A stationary packer unit according to claim 2, wherein the power cylinder is mounted in the supporting frame, a self-contained power unit operatively connected with the power cylinder for supplying fluid power thereto, and means mounting the power unit within the frame for detachment and removal therefrom.

5. A stationary packer unit comprising a supporting frame, guides on opposite sides of the frame, a packer head mounted

on the guides for reciprocating movement lengthwise thereof, a power cylinder mounted in the frame in an elevated position, a subframe detachably mounted within the supporting frame, and a self-contained power unit mounted on the subframe and connected therewith and including means for supplying fluid power to the cylinder, said subframe being bodily removable from the supporting frame with the power unit thereon for replacement of the power unit.

6. A stationary packer unit according to claim 5, wherein the power unit on the subframe is mounted in the frame extending from side-to-side thereof below the cylinder and is removable from the frame.