

Jan. 25, 1966

H. E. SMITH

3,230,868

GARBAGE COMPACTER

Filed June 5, 1964

4 Sheets-Sheet 1

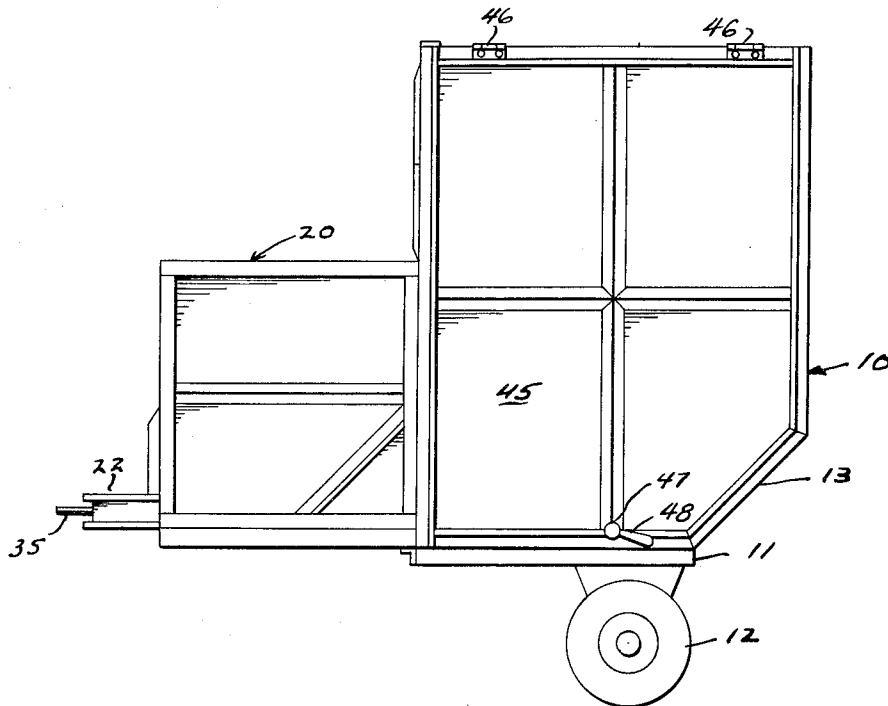


Fig. 1

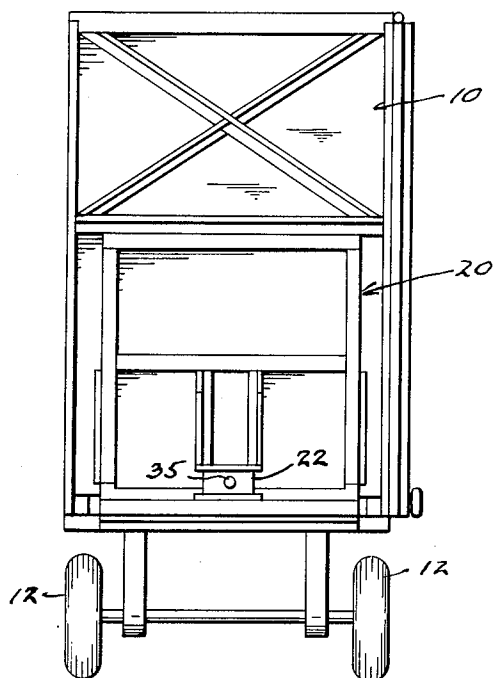


Fig. 2

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4 Sheets-Sheet 2

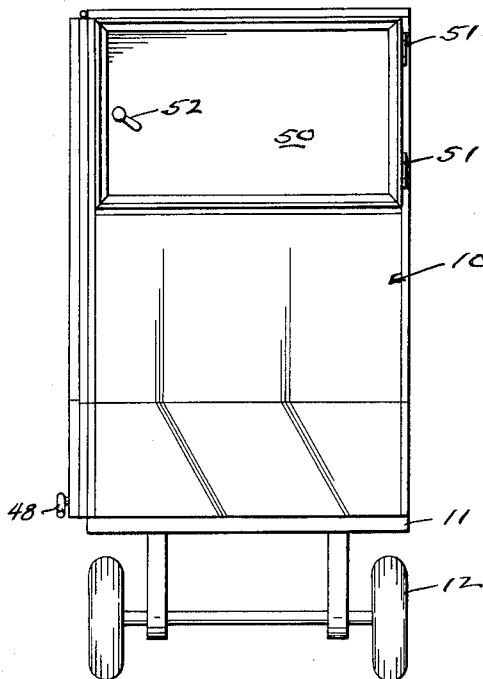


Fig. 3

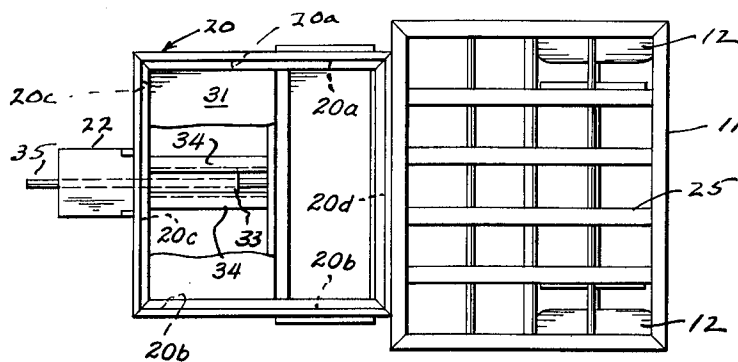


Fig. 4

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4 Sheets-Sheet 3

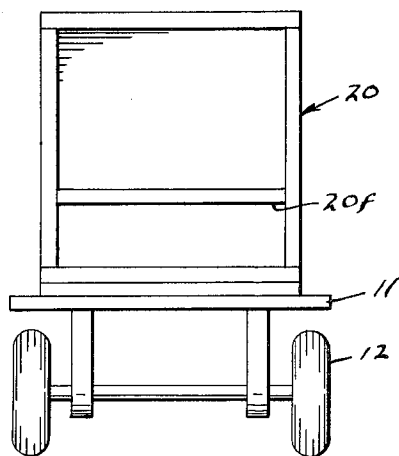


Fig. 5

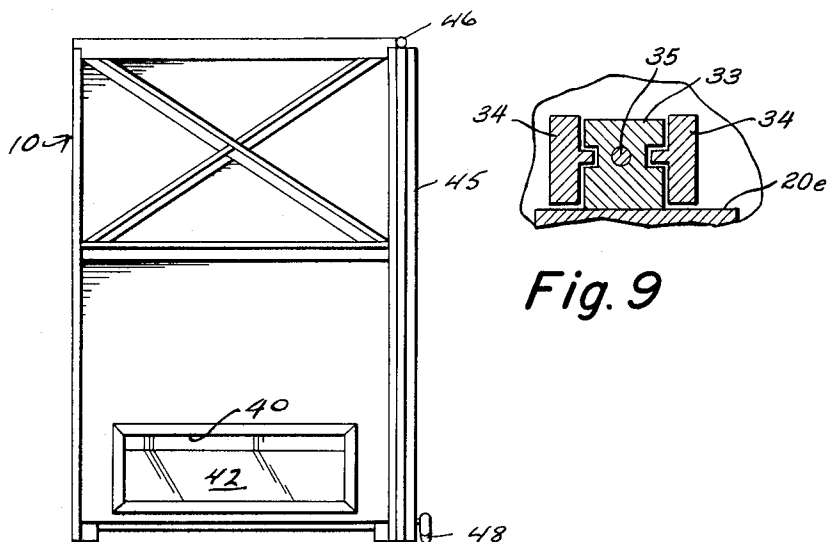


Fig. 9

Fig. 6

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4 Sheets-Sheet 4

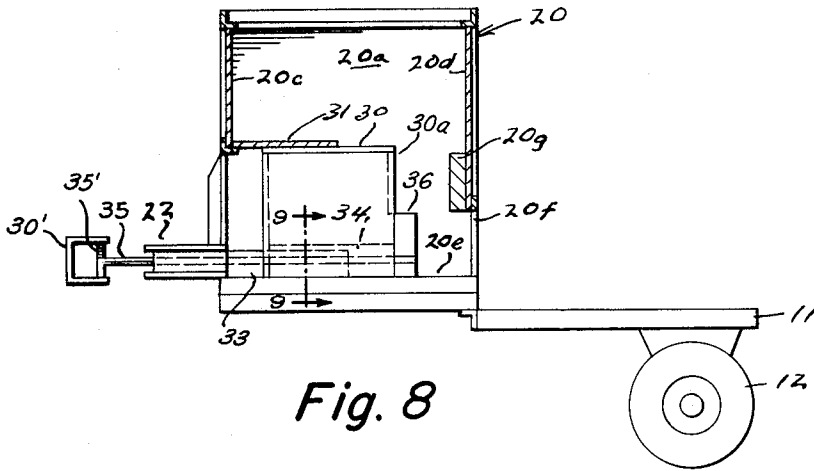


Fig. 8

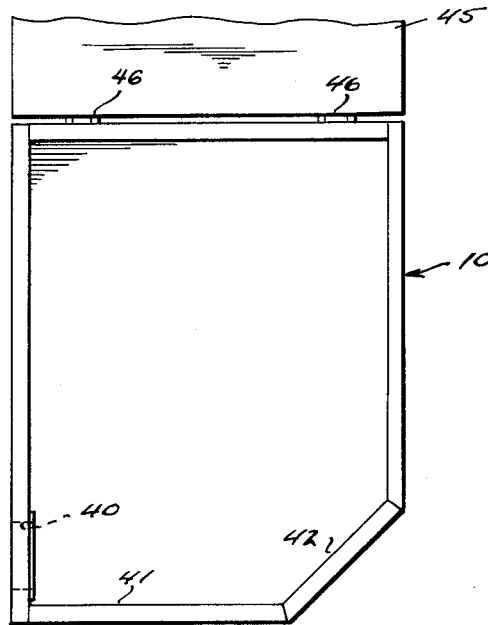


Fig. 7

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3,230,868

GARBAGE COMPACTER

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Filed June 5, 1964, Ser. No. 372,743

1 Claim. (Cl. 100-100)

This invention relates to apparatus for the collection of refuse. More particularly it relates to an apparatus which may be attached to an ordinary truck or vehicle and wherein the refuse may be placed into a hopper and compacted in the hopper in multiple stages, and ultimately forced into a storage compartment. Although it will be described as being a trailer type device, it is contemplated that the structure could be an integral part of a truck.

As is well known, one of the problems confronting modern civilized communities is that of the disposal of bulky waste materials, such as garbage or other refuse. Not the least of these problems is concerned with the transportation of that material from the collecting point to the ultimate disposal point.

Refuse loosely thrown into a truck, takes up considerable volume. Thus, in communities of any size, frequent trips must be made from the collecting point to the ultimate disposal point. Therefore, anything that can be done to lessen the number of trips results in a considerable saving of time and expense. In connection with certain types of refuse, such as boxes, papers and the highly compactible refuse, not the least of the problems is the ultimate disposal. Anything that can be done to reduce the volume of this material and thus decrease the area needed for the final disposal, is of a useful nature.

The present invention is one wherein the various types of refuse, including garbage and compactible refuse, may be easily collected, compacted, and forced into a storage compartment. Due to its compacted nature, a considerably greater amount of refuse can be stored, thus enabling a much larger territory to be covered by one trip, reducing the number of trips from the collecting points to the disposal point, and reducing the volume of the material for disposal at the disposal point.

Briefly, the invention contemplates a tractor vehicle having a compactor stage mounted on the forward end and a storage compartment mounted rearwardly of the compactor stage. The material is first compacted in the compactor compartment and is automatically passed from the compactor portion into the storage portion. The pre-compacted portion gradually accumulates in the storage portion and eventually the accumulation in the storage portion is such as to increase the compacting action of the compacting portion, thereby reducing the size of the vehicle for picking it up and increasing the mobility.

The advantages of the improved construction is that the storage portion, once filled, can be removed and transported to the place of disposal and replaced by an empty storage compartment, and thus enable a more continuous pick-up of the refuse with a minimum of "down" time.

It will also be apparent that by this apparatus a vastly more economical construction can be provided, which is within the purchasing capabilities of smaller communities. Furthermore, because of its simplicity, a minimum of maintenance work is required.

Still other advantages of the invention, and the invention itself will become more apparent from the following description of an embodiment thereof, which is illustrated by the accompanying drawings and forms a part of the specification.

In the drawings:

FIG. 1 is a side elevational view of the invention;

FIG. 2 is a front elevational view of the invention;

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FIG. 3 is a rear elevational view of the invention;

FIG. 4 is a top plan of the invention, with the storage compartment removed;

FIG. 5 is a rear elevation with the storage compartment removed;

FIG. 6 is a front elevation of the storage compartment removed;

FIG. 7 is a side elevational view of the storage compartment, with the side door open;

FIG. 8 is a view, partly in elevation and partly in section, of the structure shown in FIG. 4; and

FIG. 9 is a sectional view taken along line 9-9 of FIG. 8.

In the drawings, I have shown an embodiment of an invention wherein in FIG. 1 there is shown a vehicle which comprises an enlarged storage compartment 10 supported by an under-carriage 11, upon rubber tired wheels 12. The storage compartment is of a generally rectangular box-like formation except for a slanting rear surface 13, about which more will be said later. Ahead of the storage compartment 10 there is a receiving and compacting compartment 20, the upper portion of which is open to receive the refuse and the interior of which is provided with a two-stage compacter mechanism, operated by a suitable reciprocatory means attached to an operating member 35 disposed in a tongue 22 on the lower front of the compartment 20. The compartment 20 may be made separately from the compartment 10. Preferably it is contemplated that the compartment 20, together with an under-carriage 11, form a support on which the storage compartment 10 may be removably disposed. To this end, the rear portion of the under-carriage is provided with a grate-like member 25 (FIG. 4) upon which the storage compartment 10 may be removably disposed.

Referring to FIGS. 1, 4 and 8, the compacting compartment 20 is box-like in shape. Inside of the compartment on the floor thereof is reciprocally mounted a compacter element or box member which comprises an enlarged rectangular element 30, substantially filling the box from one side to the other, as viewed in FIG. 4, between the side 20a and 20b and extending from the front wall 20c about half-way to the rear wall 20d. This member is ordinarily provided with a closed top. In FIG. 4 the top has been broken away to show the construction underneath. The bottom wall 20e of the chamber 20 is provided with a guide rail 33. The box member 30 is provided with a pair of ways 34 disposed on opposite sides of the guide rail. A rod 35 extends through a bore in the tongue 22 and is secured to the compacter element. When the rod 35 is reciprocated, the compacter element is movable toward and away from the wall 20d. A plate 31 extends from the front wall over the compacter element and in cooperation with the top of member 30 prevents refuse from falling between the front wall 20c and the compacter.

As best shown in FIG. 8, the compacter element is comprised, as stated, of the enlarged preliminary compacter assembly of generally rectangular cross-section and having on its lower rear end a stepped out portion 36 which is of full width but is reduced in height and depth, extending from front to rear, as compared with the main section from which it is stepped out.

The rear end of the compacter compartment, which is defined by the wall 20d, has as its lowermost portion a rectangular opening 20f. This opening extends the full width of the compartment 20. The top of this opening is defined by an abutment 20g which projects inwardly into the compartment from the top of the window opening 20f. The main body of the compacter 30, which fills the compartment from side to side, has a height that is equal to the combined height of the top of the inwardly projecting portion 20g and the window opening 20f. The

shorter step portion 36 of the compacter element 30 is of a size such that when the compacter element moves toward the rear window, this portion will extend into and substantially close the window opening 20f, passing under the projection 20g.

The compacter element is reciprocated backward and forward between the front wall 20c and rear wall 20d. The refuse is thrown into the compacter compartment through the open top. Although the top is open, it may be provided with a hinged lid, not shown. The refuse so thrown into the compartment falls on top of the compacter element when it is in the rearmost position and between the compacter element and the rearmost wall when it is in the forward position. Assuming that the material is thrown into the compartment when the compacter is in the forward position, it will fall into the space above plate 31 and the top of compacter 30 and also into the space between the abutment 20g and above the step defined by the top of the step 36 and the rear of the compacter.

At the start of the operation the material, which falls between the window opening 20f and the step 36 upon the first reciprocation of the compacter, is merely pushed through the opening 20f, but the material immediately above it will be compressed between the wall 30a and the abutment 20g, during this rearward movement. At the end of the compression stroke, the compacter member reciprocates to its forward position and the compacted material, which was compacted between the wall 30a of the compacter and the abutment 20g, will now fall into the space between the step portion 36 and the window opening 20f. At this time more material is fed into the space where the compacted material left and fell into the space opposite the window opening 20f, and on the next stroke the compacted material will be pushed through the window opening 20f and more material compacted as above.

As previously stated, the storage compartment is supported on the rack or grill 25. As best shown in FIG. 6, the storage compartment has a front window or window means 40 which is the same size as the window opening 20f and, when in position, is in alignment therewith. It will be apparent, therefore, that the compacted material, once operation is started, is pushed from the compacter chamber through the window opening 20f and the window 40 into the interior of the storage compartment. This material is pushed across the floor 41 of the storage compartment, as best shown in FIG. 7, until it eventually reaches the upwardly slanting wall 42 at the rear of the storage compartment. Continuous operation of the device causes the compacted material to be passed across the floor 41, up the wall 42, gradually filling the storage compartment from the bottom.

It will be apparent from the above that after a short time of operation, the weight of the material accumulated in the storage compartment will cause an interference with the passage of the compacted material through the window opening 20f and 40. This will thus cause the smaller section 36 of the compacter element to cause further compression of the material as it is forced through the openings 20f and 40. Thus two stages of compression are provided, the first one being the preliminary compression by the upper part of the compacter 30 and the step 36, and the second one being a further compression between the compacter 36 as it pushes the material through the windows 20f and 40, which material is obstructed by the weight of the material previously forced through the window.

This process continues until eventually the storage compartment becomes so filled that the material hits the top. The two-stage compression effect is realized almost immediately. After the material hits the top, the two-stage compression becomes even more effective, amplifying that of the compacter compartment by the compacting and passage of the material from the compacter com-

partment into the storage compartment. Thus, eventually the storage compartment can be packed completely and fully.

It will be noted, as can be seen from FIG. 2, and by comparison of FIG. 6 with FIG. 5, that the storage compartment is wider than the compacter compartment. Therefore as the material passes through the window 40 there is a slight release of the compressive effect, which causes the material to expand beyond the side extremities of the window 40. This has a valve effect which keeps the material from re-entering into the compacter compartment, through the window opening 20f and window 40, which assists the inherent resistance of the material which has been pushed into storage to pass backward.

It has been found that as a matter of operation there is a minimum of compacting action at the start but that as the material is accumulated in the storage compartment, the compacting action gradually increases until the material hits the top of the compartment and after that the compacting increases until eventually, due to the small size of the compacter and its valve effect in combination with the window opening, the material is eventually compacted to substantially a solid state.

Thus, because of this arrangement and the fact that the material is being pushed in from the bottom through the window opening and window, the refuse is materially reduced in its volume. This enables the operator to cover a considerably larger territory than heretofore was possible. The result is that the operator makes fewer trips to the place of disposal and this is a considerable saving in time that would otherwise be lost with ordinary equipment which fills up sooner and has to be disposed of sooner.

When the device is eventually filled to the place where no more can be compressed, it is then taken to the point of disposal and the side door 45, which is hinged at the top at 46, may be opened by means of the latch 47 which has a handle 48, and swung to the open position, as shown in FIG. 7.

To facilitate the discharge of the material, there is provided an auxiliary rear door 50, hinged at 51 and controlled by a latch 52. This door can also be opened for the loading of material too large for the compressor.

As previously stated, the storage compartment can be removed from the compacter compartment. If desired, more than one storage compartment can be provided. A tractor vehicle may be provided for pulling the entire assembly and a second truck or trucks may be used to shuttle the storage compartment between the compacter and the dump. Although I have shown the device as being adaptable to attachment to any ordinary truck, it is contemplated that it may be a permanent installation with the tractor portion. Thus one driver and his assistant may operate the compacter and storage compartment until it is filled and the storage compartment slid from the tractor onto the truck and an empty storage compartment used to replace the filled compartment. This allows the driver and his assistant to continue with a minimum of interference with the operation in the collection of the refuse.

It is apparent that the piston 35 of an air cylinder 30 could be integral with reciprocating rod 30 and that this may be operated by the truck's air supply, or a separate compressor. Likewise, it is contemplated that this reciprocation be effected by hydraulic means.

Due to the compact nature of the device, it may be installed in certain places, where warranted by the amount of refuse, as a semi-permanent installation. After a period of time, when it becomes filled, it may be hauled away to the place of refuse disposal.

Having thus described the invention in an embodiment thereof, I am aware that numerous and extensive departures may be made therefrom without departing from the spirit or scope of the invention as defined in the appended claim.

I claim:

A refuse compacter comprising an under-carriage, wheels connected to the under-carriage for supporting the same, a compacter and hopper mechanism carried by the under-carriage and comprising an open top housing of generally cubic conformation with closed side walls, a closed front wall, a rear wall and a closed bottom wall, a compacter member reciprocally mounted in said housing on the floor thereof for movement toward and away from said front and rear walls, said member occupying a portion of the lower half of said housing and having a rear upper compression surface and a rear lower compression surface, said surfaces being in step relationship with said lower compression surface being more adjacent said rear wall, said compression surfaces extending completely between the side walls of said housing, said compacter member having a top spaced from the top of said housing, said housing having a plate secured to said front wall and side walls of said housing and being spaced immediately above said compacter member, said rear wall having a window opening formed in the bottom thereof having the same cross-sectional area and configuration as said lower compression surface of said compacter member, an abutment on the rear wall of said housing immediately above said window opening extending from one side wall to the other and adapted to be engaged by the upper compression surface of said compacter member, means to reciprocate said compacter member between the front and rear walls, a storage compartment larger than said compacter and hopper mechanism having closed top, bottom and side walls with doors located therein, and removably disposed on said under-carriage, a window in a wall of said storage compartment in registration with said window opening in said housing and

having the same shape and cross-sectional area thereas, said storage compartment including a deflecting wall in the path of travel of refuse passed through said window opening and window, for deflecting the material upwardly in said storage compartment.

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WALTER A. SCHEEL, *Primary Examiner*.