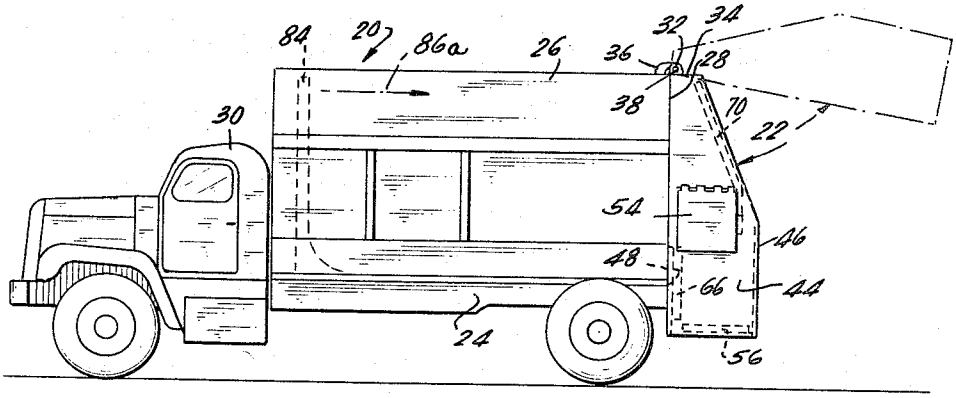
Nov. 28, 1967 A. W. NELSON 3,355,044

REFUSE TRUCK

Filed March 25, 1965 2 Sheets-Sheet 1

FIG. 1.



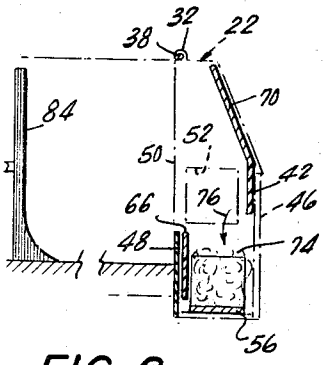


FIG. 2.

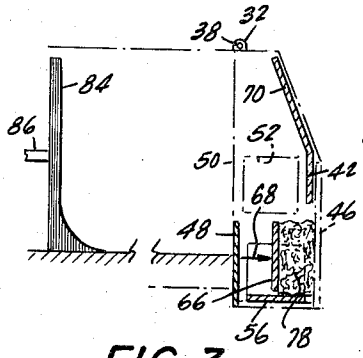


FIG. 3.

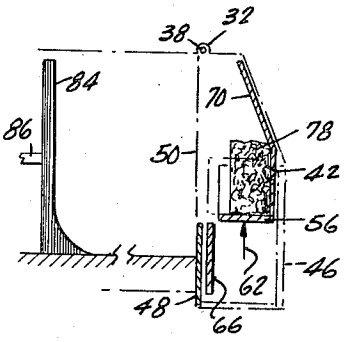


FIG. 4.

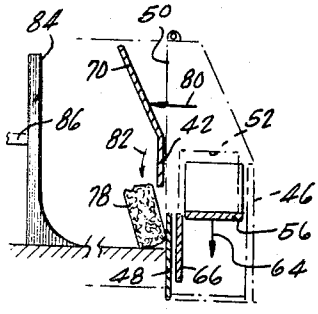


FIG. 5.

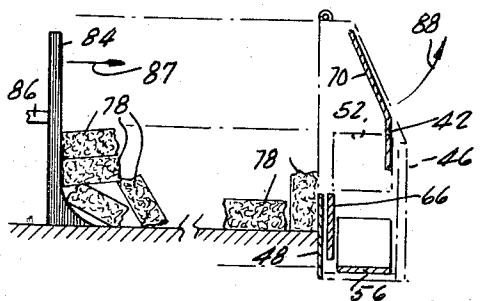


FIG. 6.

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Nov. 28, 1967 A. W. NELSON 3,355,044

REFUSE TRUCK

Filed March 25, 1965 2 Sheets-Sheet 2

FIG. 7.

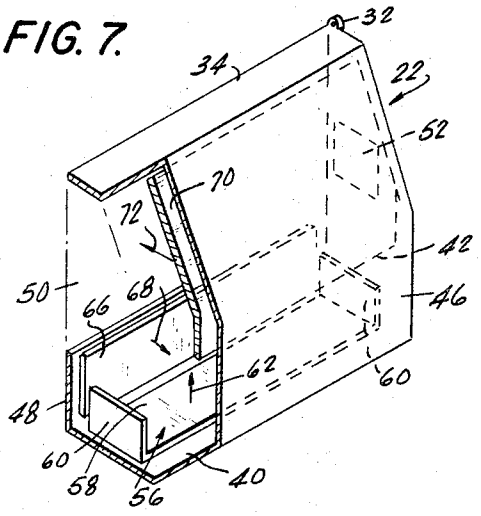


FIG. 8.

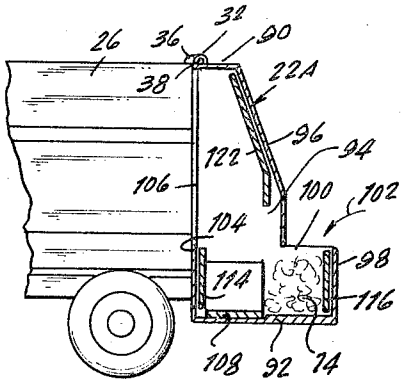
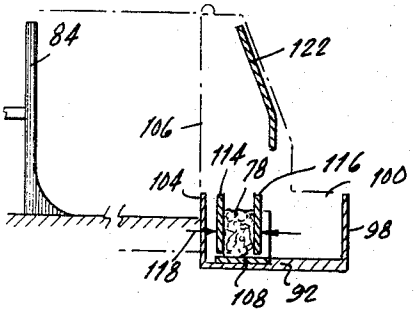


FIG. 9.



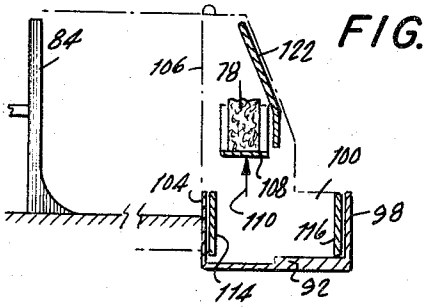
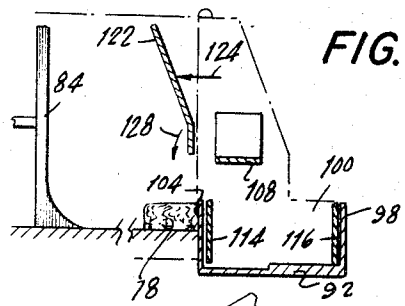


FIG. 10.

FIG. 11.



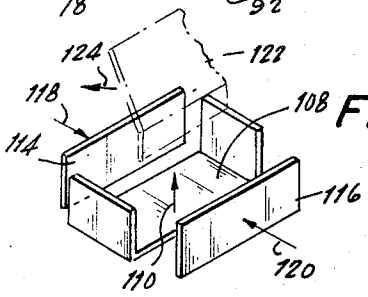
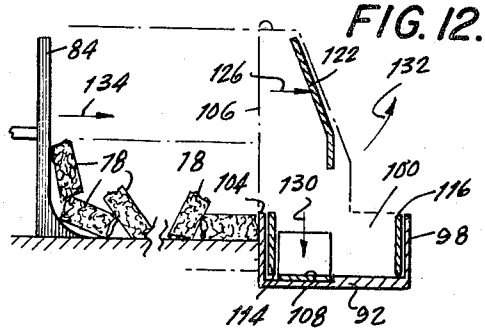


FIG. 13.

FIG. 12.



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3,355,044

REFUSE TRUCK

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Filed Mar. 25, 1965, Ser. No. 442,702
4 Claims. (Cl. 214—518)

The present invention relates in general to refuse trucks and in particular, to improvements in loading and compacting means for such trucks.

In order to achieve efficient and economical operation of a refuse truck, the stored refuse must be properly compacted and forced away from the loading hopper if an adequate load is to be provided in the truck.

Various different types of refuse compacting means are disclosed in the prior art. In such prior art devices, compaction of the refuse is achieved by relatively complicated packing mechanisms which are confined to locations above or in alignment with the opening in the truck hopper. However, due to the restricted location of these compacting mechanisms of the prior art, such mechanisms are of necessity complicated and must be properly synchronized with the deposition of refuse from the hopper into the interior of the truck body. In addition, since the hopper opening is generally located above the bottom of the truck body, refuse which is lodged in the lower rearward portion of the truck body is frequently by-passed by the compacting action. In addition, stoppage of the compacting mechanism results in a complete or a partial blockage of the flow of refuse into the truck interior with the result that the truck is rendered inoperative.

In view of the foregoing, it is an object of the present invention to provide a loading and compacting means for refuse trucks which obviates the disadvantages of the prior art loading and compacting means.

It is another object of the present invention to provide such a means which is relatively simple in construction, efficient in operation and which will have a relatively long life.

It is another object of the present invention to provide such a compacting means which can be manufactured at a relatively low cost and sold at a relatively low price and which, nevertheless, will be highly efficient in operation.

It is a further object of the present invention to provide a loading and compacting means for a refuse truck wherein discrete charges of refuse are loaded into the loading hopper, each charge being compacted in a relatively simple manner and then loaded directly in compacted form into the refuse truck body.

Other and further objects and advantages of the present invention will become readily apparent to one skilled in the art from a consideration of the following specification taken in connection with the appended drawings.

In the drawings which illustrate the best modes presently contemplated for carrying out the invention:

FIGURE 1 is a side elevation view of a refuse truck pursuant to the present invention;

FIGURE 2 is a more or less diagramatic illustration of a loading and compacting means for a refuse truck pursuant to the present invention and illustrates said means with a discrete charge of refuse disposed within the tail gate hopper thereof;

FIGURE 3 is a view similar to FIGURE 2 and illustrates the means for compacting the charge of refuse;

FIGURE 4 is a view similar to FIGURE 2 and illustrates the compacted refuse charge being elevated for loading into the truck body;

FIGURE 5 is a view similar to FIGURE 2 and illustrates the loading of the compacted charge into the truck body;

FIGURE 6 is a view similar to FIGURE 2 and illustrates a loaded truck body showing the compacted refuse charges in condition for being discharged or unloaded from the truck;

FIGURE 7 is a diagramatic perspective view of the loading and compacting means pursuant to the present invention;

FIGURE 8 is a view similar to FIGURE 2 and shows a modified form of loading and compacting means for a refuse truck in which the refuse hopper has provision for the rear-loading of the refuse charges therein;

FIGURE 9 is a more or less diagramatic view of the refuse loading and compacting means in the form of the invention illustrated in FIGURE 8, the loaded refuse charge being in the process of being compacted;

FIGURE 10 is a view similar to FIGURE 9 and illustrates the compacted refuse charge in a raised position thereof prior to loading into the truck body;

FIGURE 11 is a view similar to FIGURE 9 and illustrates the loading of the compacted refuse charge into the truck body;

FIGURE 12 is a view similar to FIGURE 9 and illustrates the compacted refuse charges disposed within the truck body prior to the discharge thereof from the truck body; and

FIGURE 13 is a diagramatic perspective view of the loading and compacting means illustrated in the form of the invention shown in FIGURE 8.

Referring now to FIGURES 1 through 7 in detail, there is shown a refuse truck **20** provided with a tail gate hopper **22** pursuant to the present invention. The refuse truck **20** is provided with a chassis **24** on which there is mounted a refuse storage body **26**. The refuse storage body **26** is provided with an open end **28** which is remote from the cab **30** of the truck. The open body end **28** is closed by the tail gate hopper **22** which is pivoted thereon. More specifically, the tail gate hopper **22** is provided with the pivot hinges **32** provided on the top wall **34** thereof. Complementary pivot hinges **36** are provided on the truck body **26** and pivot pins **38** interconnect the complementary hinges of the hopper and the truck body. In view of the foregoing, it will be apparent that the tail gate hopper **22** may be moved to and from the full line position thereof shown in FIGURE 1 in which the hopper closes the rear end opening of the truck body and the broken line position thereof in which the hopper is retracted from the rear end opening **28** so as to permit for the discharge of the contents of the truck body.

As best shown in FIGURE 7, the tail gate hopper **22** is provided in addition to the top wall **34** with a bottom wall **40** opposing end walls **42** and **44** and a rear wall **46** which extends from the top wall **34** to the bottom wall **40**. In addition, the hopper **22** is provided with a front wall **48** which extends only part way upwardly from the bottom wall **40** toward the top wall **34** so that there is defined a front wall opening **50** through which compacted refuse charges may be discharged from the tail gate hopper **22** into the truck body **26**. The tail gate hopper **22** is adapted for side loading thereof and for this purpose each of the

end walls **42** and **44** is provided with a loading opening **52** which is closed by a hinged cover **54**.

Pursuant to a feature of the present invention, the tail gate hopper **22** is provided with an elevating platform **56**. The platform **56** comprises a base **58** which is provided with a pair of upwardly extending end walls **60**. As indicated by the arrows **62** in FIGURES 4 and 7, the elevating platform is adapted to be raised from its bottom or lower-most position shown in FIGURE 7 to its elevated position shown in FIGURE 4 and to return from said elevated position as indicated by the arrow **64** in FIGURE 5 to its lower-most or initial position as shown in FIGURE 7. It will be understood that the truck **20** is provided with suitable conventional mechanism for effecting the elevation and retraction of the elevating platform **56** to and from the position thereof shown in FIGURES 4, 6 and 7. Such conventional mechanism is preferably a suitable hydraulic means. The hopper **22** is provided also with a compacting member **66**. The member **66** is adapted to be moved from the retracted positions thereof shown in FIGURES 2 and 7 to the projected position thereof shown in FIGURE 3 as indicated by the arrows **68**. In addition, the compacting member **66** is adapted to be returned from its projected position to its retracted position. It will be understood that any suitable conventionable means may be provided for this purpose, such means being preferably hydraulic in nature. In addition to the elevating platform **56** and the compacting member **66**, the tail gate hopper **22** is provided also with a discharge or unloading member **70**. The discharge member **70** is adapted to be moved from the retracted position thereof shown in FIGURE 7 to the projected position thereof shown in FIGURE 5 as indicated by the arrow **72** and to be returned from said projected position to said retracted position. For this purpose suitable conventional means preferably hydraulic in nature are provided in the truck **20**.

From the foregoing, it will be understood that with the various elements of the tail gate hopper **22** disposed in the condition thereof illustrated in FIGURES 2 and 7, either or both of the covers **54** may be opened so that a charge of refuse **74** in uncompacted condition may be loaded on the elevating platform **56** as indicated by the arrow **76** in FIGURE 2. The compacting element **66** is then operated as indicated by the arrow **68** in FIGURE 3 so that it is moved toward the rear wall **46** of the hopper so as to compact the refuse charge **74** therebetween to provide a compacted refuse charge **78** on the elevating platform **56**. The compacting element **66** is then returned to its original retracted position as shown in FIGURE 4. It will be noted that in its retracted position the compacting element is clear of the elevating platform. Consequently, the elevating platform is then raised from its retracted position to its upwardly projected position as indicated by the arrow **62** in FIGURE 4. It will be noted that in said position the compacted refuse charge **78** is now disposed between the discharge member **70** and the discharge opening **50** in the hopper **22**. The discharge member **70** is now operated from its retracted position shown in FIGURE 4 to its projected position shown in FIGURE 5 as indicated by the arrow **80** with the result that the compacted refuse charge **78** on the elevating platform **56** is moved through the opening **50** and discharged into the hollow interior of the refuse storage body **26** as indicated by the arrow **82** in FIGURE 5. The discharge member **70** is then returned from its projected to its retracted position, the elevating platform **56** also being returned from its elevated or projected position to its retracted position as indicated by the arrow **64**. An uncompacted refuse charge **74** is now again deposited on the elevating platform **56** through the side openings **52** and the compacting and discharge process is repeated through the described steps so that another compacted refuse charge **78** is deposited in the truck body **26**. The process is continued until the body **26** is loaded with compacted refuse charges **78** as indicated in FIGURE 6.

Pursuant to another feature of the present invention, the refuse storage body **26** is provided within the hollow interior thereof with a discharge or unloading element or member **84**. Member **84** is normally positioned adjacent the cab **30** as shown in broken line in FIGURE 1. It will be understood that the truck body **26** is provided with suitable conventional mechanism to move the discharge member **84** from its retracted position as shown in FIGURE 1 in the direction of the arrow **86***a* toward the open end **28** of the hopper and to return the discharge member from said protracted position thereof to its retracted position. Said conventional mechanism is preferably a suitable hydraulic means which is generally indicated by the reference numeral **86**. Consequently, it will be understood that when the truck body **26** is fully loaded with the compacted refuse charges **78** the tail gate hopper **22** is retracted or pivoted as indicated by the arrow **88** in FIGURE 6 from its retracted position shown in said figure to its projected or broken line position shown in FIGURE 1. With the tail gate hopper retained in said retracted position therof, the unloading member **84** is now operated in the direction of the arrow **86** so as to discharge the compacted refuse charges **78** from the truck body **26** through the open rear in **28** thereof.

Referring now to FIGURES 8 through 13 in detail, there is shown a tail gate hopper **22A** which is adapted for rear loading rather than for side loading as in the case of the previously described tail gate hopper **22**. It will be understood that the tail gate hopper **22A** is pivotally mounted on the open rear end of the truck body **26** in the same manner as previously described in connection with the tail gate hopper **22**. As here shown, the tail gate hopper **22A** is provided with a top wall **90**, a bottom wall **92** and a pair of opposing side walls **94**. In addition, provision is made for an upper rear wall portion **96** which extends downwardly from the upper wall **90** and a lower rear wall portion **98** which extends upwardly from the bottom wall **92**. Said upper and rear wall portions define a rear wall opening **100**. The opening provides a means for the rear loading of the tail gate hopper **22A** as indicated by the arrow **102** in FIGURE 8. The tail gate hopper **22A** is provided also with a front wall **104** which extends between the bottom wall **92** and the top wall **90** and in which there is defined a discharge opening **106**.

Provision is made in the tail gate hopper **22A** for an elevating platform **108** which is similar to the previously described elevating platform **56** and is adapted to be raised from its lower or retracted position as shown in FIGURE 8 to its upper or projected position as shown in FIGURE 10 as indicated by the arrows **110**. It will be understood that the operating mechanism for the elevator **108** is also adapted to return the elevator from its projected to its retracted position and may be similar in nature to the type utilized to operate the elevator platform **56**. It will be noted that the elevator platform **108** is spaced forwardly from the rear wall portion **98** and being disposed closer to the front wall **104**. The elevator platform **108** is normally seated in a recess **112** defined in the bottom wall **92** and is straddled by the cooperating compacting members or elements **114** and **116**. Compacting element **114** is normally disposed adjacent the front wall **104** and compacting element **116** is normally disposed adjacent the rear wall portion **98**. It will be understood that the compacting elements are adapted to be moved together from the retracted positions thereof indicated in FIGURE 8 as shown by the arrows **118** and **120** to the projected positions thereof as shown in FIGURE 9 and to be returned from said projected to said retracted positions thereof. For this purpose, any suitable conventional mechanism may be utilized preferably a hydraulic means. In addition, the tail gate hopper **22A** is provided also with a discharge member **122** which is adapted to be moved or operated in the same manner as the previously described discharge member **70** and as indicated by the arrow **124** and then

returned from its projected condition to its retracted position as indicated by the arrow **126**. As previously in connection with the member **70**, any suitable conventional mechanism preferably hydraulic in nature may be provided for this purpose.

At the start of each cycle of operation, the various elements are disposed in the positions thereof illustrated in FIGURE 8. It will be noted that in said position thereof an uncompacted refuse charge **74** may be deposited through the rear leading opening **100** as indicated by the arrow **102** between the compacting element **116** and the elevator platform **108**. The companion compacting elements **114** and **116** are then operated to move together so that the compacting element **116** will move the uncompacted refuse charge **74** onto the elevating platform **108** so as to be compacted between the companion compacting elements to form a compacted refuse charge **78** on the elevating platform **108** as best shown in FIGURE 9. The elevating platform **108** is then moved upwardly from its retracted position as indicated by the arrow **110** to its projected position as shown in FIGURE 10. It will be noted that in said projected or raised position of the elevating platform, the compacted refuse charge **78** is disposed between the discharge member **122** and the front wall opening **106** in the tail gate hopper **22**. The discharge member **122** is then operated as indicated by the arrow **124** in FIGURE 11 to the projected position thereof as shown in said figure so as to move the compacted refuse charge **78** from the elevating platform **108** through the discharge opening **106** as indicated by the arrow **128** in FIGURE 11 to move the compacted refuse charge **78** into the hollow interior of the body **26**. The discharge member **122** is then returned from its protracted to its retracted position as indicated by the arrow **126** in FIGURE 12 and the elevator platform **108** is moved downwardly from its raised or protracted position to its lowered or retracted position as indicated by the arrow **130** in FIGURE 12. As each successive charge of uncompacted refuse **74** is inserted through the rear end opening **100** into the tail gate hopper **22A** the cycle is repeated until the hollow interior of the body **26** is fully loaded with compact refuse charges **78** as illustrated in FIGURE 12. The tail gate hopper **22A** is then pivoted to its upper or opened position as indicated by the arrow **132** in FIGURE 12 and while retained in said position, the discharge or unloading member **84** is operated in the direction of the arrow **134** in FIGURE 12 so as to discharge the contents of the hollow truck body **26** outwardly thereof through the rear end opening **28** thereof.

In view of the foregoing, it will be apparent that there has been illustrated and described a highly novel mechanism for loading a tail gate hopper with uncompacted refuse charges which are compacted therein and transferred therefrom into the hollow interior of a truck body. When the truck body of the refuse truck is loaded with compacted refuse charges, the tail gate hopper is retracted to open the rear end opening of the truck body, the compacted refuse charges then being discharged therefrom. It will be understood that various changes and modifications may be made in the present invention without, however, departing from the basic inventive concept thereof as set forth in the appended claims.

I claim:

1. A refuse truck comprising a refuse storage chamber and a tail gate hopper pivoted to the truck and having an inner wall which closes an end opening of said chamber, an opening provided in said inner wall for communication with said chamber, said hopper having means to load uncompacted refuse charges therein, elevator means provided in said hopper, compacting means provided in said hopper to convert each uncompacted charge into a compacted refuse charge for elevation by elevator means to a raised position, and discharge means provided in said hopper for moving each raised compacted charge from said elevator means through said inner wall opening into said refuse chamber, and unloading means provided in said storage chamber for discharging said compacted charges through said end opening when said hopper is pivoted to a position to uncover said end opening, said hopper having an outer wall and a pair of side walls, said loading means being an opening defined in said outer wall, and said compacting means comprising a pair of cooperating compacting members movable together from retracted positions adjacent said inner and outer walls, respectively.

2. A refuse truck comprising a truck chassis having a cab at one end thereof, an enclosed truck body mounted on said chassis rearwardly of said truck and having an end opening remote from said cab, a tail gate hopper hinged to said truck body to normally close said end opening, said hopper having an inner wall, an outer wall, opposing end walls, an upper wall and a bottom wall, said inner wall having an opening in communication with said truck body, an elevator normally disposed on said bottom wall and mounted for reciprocation relative to said top wall, a refuse loading opening defined in said hopper for depositing uncompacted refuse therein, compacting means reciprocable between said inner and outer walls to compact the uncompacted refuse onto said elevator, and discharge means mounted for reciprocation relative to said outer wall for moving the compacted refuse from the raised elevator through said inner wall opening into said truck body, and unloading means mounted in said truck for reciprocation between said cab and said end opening for discharging compacted refuse through said end opening when said hopper is pivoted to a position to uncover said end opening, said refuse loading opening being defined in said outer wall to load the uncompacted refuse between said elevator and said outer wall, and said compacting means comprising a first compacting member normally disposed between said elevator and said inner wall and a second compacting member normally disposed between said elevator and outer wall, said compacting members being movable together to compact said uncompacted refuse onto said elevator.

3. A refuse truck comprising a truck chassis having a cab at one end thereof, an enclosed truck body mounted on said chassis rearwardly of said truck and having an end opening remote from said cab, a tail gate hopper hinged to said truck body to normally close said end opening, said hopper having an inner wall, an outer wall, opposing end walls, an upper wall and a bottom wall, said inner wall having an opening in communication with said truck body, an elevator normally disposed on said bottom wall and mounted for reciprocation relative to said top wall, a refuse loading opening defined in said hopper for depositing uncompacted refuse therein, compacting means reciprocable between said inner and outer walls to compact the uncompacted refuse onto said elevator, and discharge means mounted for reciprocation relative to said outer wall for moving the compacted refuse from the raised elevator through said inner wall opening into said truck body, and unloading means mounted in said truck for reciprocation between said cab and said end opening for discharging compacted refuse through said end opening when said hopper is pivoted to a position to uncover said end opening, said refuse loading opening being defined in one of said end walls to load the uncompacted refuse directly into said elevator, and said compacting means comprising a compacting member normally disposed between said elevator and said inner wall for compressing the uncompacted refuse against said outer wall by reciprocation of said compacting member relative to said outer wall.

4. A refuse truck comprising a refuse storage chamber and a tail gate hopper pivoted to the truck and having an inner wall which closes an end opening of said

chamber, an opening provided in said inner wall for communication with said chamber, said hopper having means to load uncompacted refuse charges therein, elevator means provided in said hopper, compacting means provided in said hopper to convert each uncompacted charge into a compacted refuse charge for elevation by elevator means to a raised position, and discharge means provided in said hopper for moving each raised compacted charge from said elevator means through said inner wall opening into said refuse chamber, and unloading means provided in said storage chamber for discharging said compacted charges through said end opening when said hopper is pivoted to a position to uncover said end opening, said hopper having an outer wall and a pair of side walls, said loading means being an opening defined in one of said walls, and said compacting means comprising a compacting member mounted

for compressing the uncompacted refuse against said outer wall by reciprocation of said compacting member relative to said outer wall.

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