

Dec. 23, 1958

E. T. NEWELL

2,865,286

PLOWS FOR GARBAGE TRUCKS

Filed Dec. 31, 1953

2 Sheets-Sheet 1

Fig 1

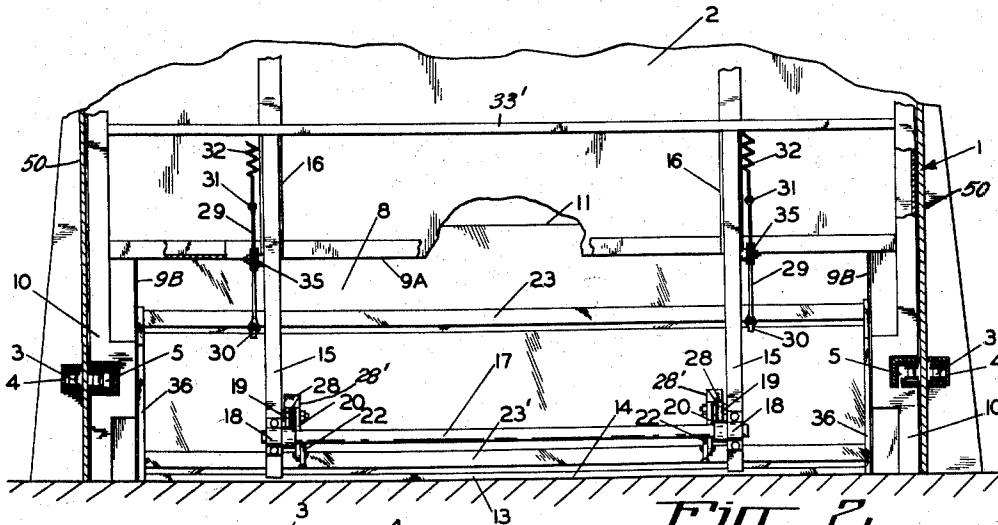
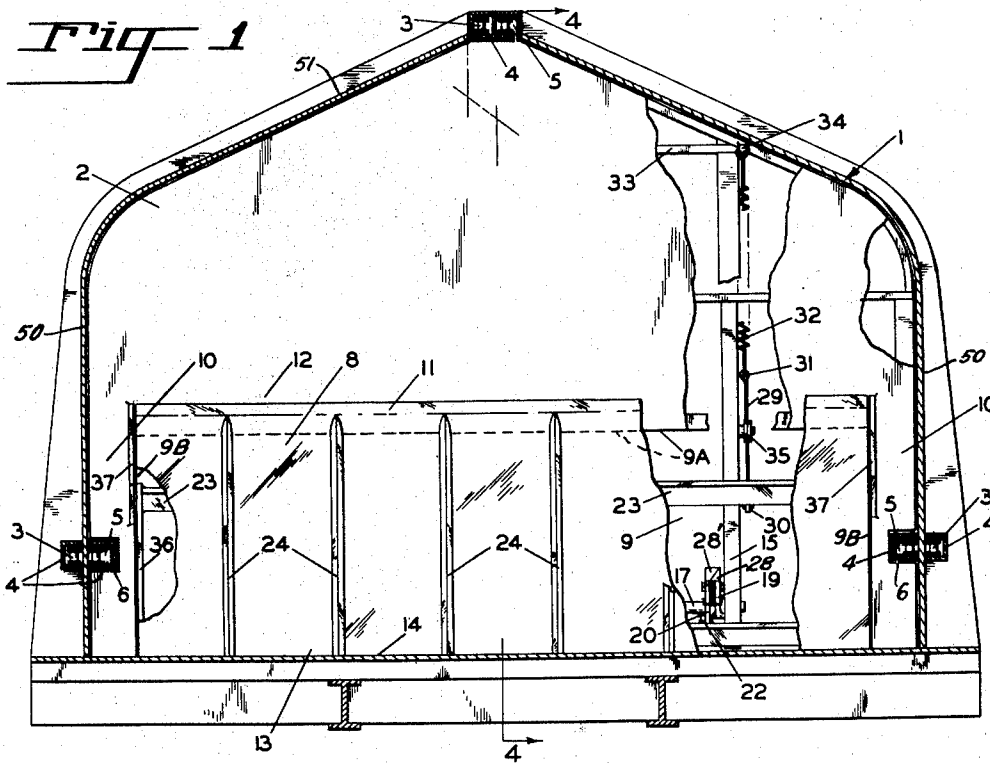


Fig 2

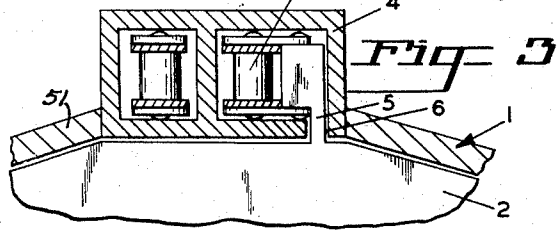


Fig 3

INVENTOR.

EDWARD T. NEWELL

BY *Wm. A. Smiley*
ATTORNEY

Dec. 23, 1958

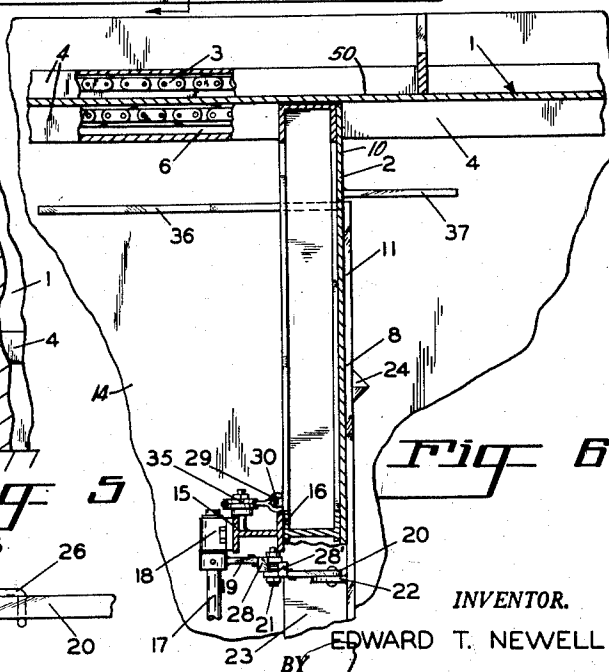
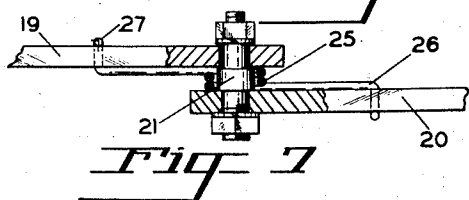
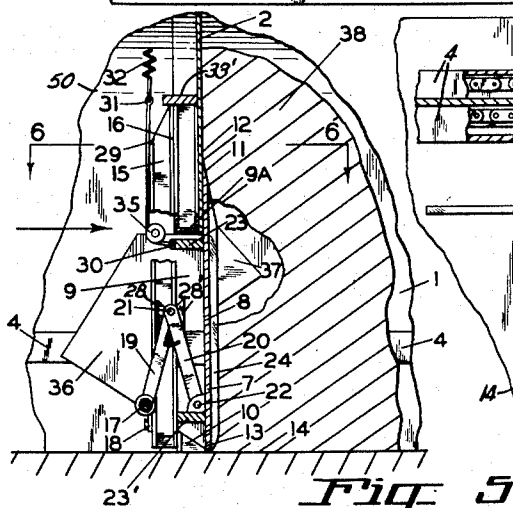
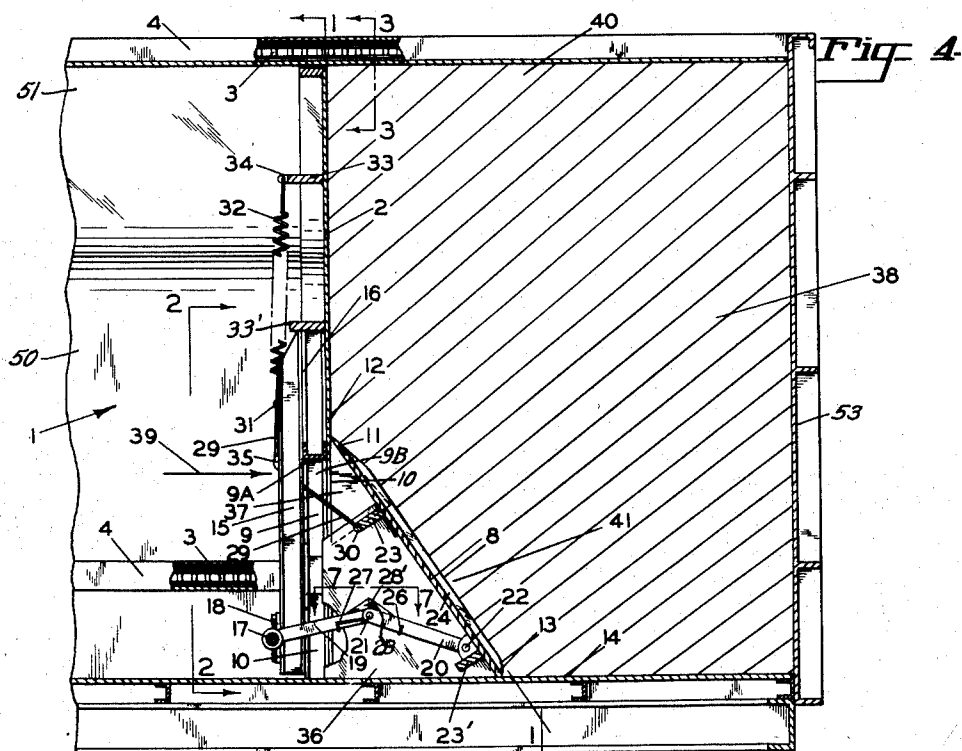
E. T. NEWELL

2,865,286

PLOWS FOR GARBAGE TRUCKS

Filed Dec. 31, 1953

2 Sheets-Sheet 2



INVENTOR.
EDWARD T. NEWELL

BY *Wm. J. Mulvey*
ATTORNEY

1

2,865,286

PLOWS FOR GARBAGE TRUCKS

Edward T. Newell, Portland, Oreg.

Application December 31, 1953, Serial No. 401,621

2 Claims. (Cl. 100—295)

This invention relates to refuse truck bodies and more particularly to packing devices for such bodies.

The usual refuse or garbage truck body is adapted to be loaded at one end and discharged at the other end with gate or door means closing the discharge end or opening, and is provided with a plow or dozer reciprocally movable longitudinally of the body with means for moving the plow to move refuse dumped into the body toward the discharge end or opening and pack the refuse in the body as well as to discharge the refuse through the discharge opening. A structure of this type is shown in my Patent No. 2,541,538. A truck body of this type, especially if employed in garbage collection, now usually comprises a closed body of generally tubular configuration including a floor and side and top walls and having access opening means at one end, usually the front end, for the admission of refuse into the body and a discharge opening, normally the rear end of the body, closed by door means.

The plow or dozer, as shown in the aforementioned patent, usually comprises a generally flat, substantially vertically disposed member extending transversely of the truck body and, if the body is closed, substantially conforming to the configuration of the body. This plow is usually provided at its lower portion with a toe inclined downwardly and toward the discharge end or opening to force the loose refuse material upwardly so as to fill the upper part of the body. It has been found, however, that when the plow is retracted for the admission of additional refuse, the toe portion leaves a cavity under the packed material and, as a result, a considerable portion of the previously packed material falls to the bottom or floor of the truck body.

Having in mind the defects of the prior art devices, it is the primary object of the present invention to provide means for packing loose material such as refuse so that the material remains substantially in its packed condition when the packing means is withdrawn from the compressed material.

It is another object of the invention to provide means for packing loose material, such as refuse, substantially the full height of a body or container.

It is still another object of the invention to provide means for packing loose material, such as refuse, by applying pressure thereto in a generally vertical plane and substantially the full height of a body or container.

The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will best be understood from the following description of a specific embodiment when read in connection with the accompanying drawings wherein like reference characters indicate like parts through the several figures and in which:

Fig. 1 is a cross-sectional view taken on line 1—1 of Fig. 4 transversely of a closed refuse truck body and show-

2

ing a packing device or plow in accordance with the present invention parts being broken away for clarity;

Fig. 2 is a fragmentary cross-sectional view taken transversely through the truck body on line 2—2 of Fig. 4;

Fig. 3 is an enlarged fragmentary cross-sectional view taken on line 3—3 of Fig. 4;

Fig. 4 is a fragmentary cross-sectional view taken on a vertical plane longitudinally through a truck body on line 4—4 of Fig. 1;

Fig. 5 is a fragmentary cross-sectional view similar to that of Fig. 4 but showing only the lower portion of the packing means or plow with the normally inclined toe portion in collapsed or retracted position;

Fig. 6 is an enlarged fragmentary cross-sectional view taken on line 6—6 of Fig. 5, and

Fig. 7 is an enlarged fragmentary view, partially in cross-section, as seen from the viewing line 7—7 of Fig. 4, of the toe-bracing mechanism.

Referring now to the drawings, specifically to Figs. 1 and 4, the present invention relates to a packing means constituted by a plow or dozer 2 of the type shown in my Patent No. 2,541,538. In the present instance, this plow is shown in conjunction with the usual closed refuse or garbage collection truck body 1 which is of generally tubular configuration and includes a floor 14, side walls 50 and a top wall 51. Normally, such a body 1 is provided at one end, usually the forward end, to the left of Fig. 4, with access opening means of any conventional form for the admission of refuse into the body 1, and a discharge opening at the other end 53, usually the rear end of the body 1, which is closed during the collecting operation but may be opened for discharge of the collected material.

The packing means or plow 2 extends across the body 1 and is reciprocally movable in the body 1 so that it can be retracted beyond the receiving or access opening of the body 1 to enable loose material or refuse to be loaded thereinto whereupon, the plow 2 is advanced or moved toward the discharge end 53 of the body 1, that is, in the direction of the arrow 39 in Fig. 4, to compress the loose material into a compact mass 38. The plow 2 may be reciprocally moved in any desired manner but, as disclosed in the aforementioned patent, the preferred moving means is constituted by endless chains 3 running in channels or guideways 4 extending longitudinally of the walls of the body 1 and having slots 6 in their inner sides to accommodate arms 5 fixed with the plow 2 and connected to the chains 3, as best shown in Figs. 1—3.

The plow 2, as shown in the aforementioned patent, preferably is disposed in a substantially vertical plane transversely of the body 1 and at its lower portion is provided with a toe portion 8 which is inclined from its working face 12 downwardly to the body floor 14 and toward the discharge end of the body 1. In operation, the inclined toe portion 8 forces the loose material upwardly from the floor 14 so as to pack the material or refuse in the upper portion 40 of the body 1 and prevent an accumulation of the material only in the lower portion thereof. However, when the toe portion 8 is in fixed relation to the plow 2, it forms a cavity or undercut portion 41 undermining the packed material 38 so that when the plow 2 is retracted to receive additional material, a portion of the packed material falls from the upper portion of the body 1 to the floor 14.

As the inclined toe portion 8 is necessary to force the material upwardly so as to fill the upper portions of the body 1, this toe portion 8, in accordance with the present invention, is constituted by a separate plate which is movably supported by the plow 2 and normally retained in an inclined position, as shown in Fig. 4, but is also capable of being collapsed, by reaction of the compressed material 38, into a position generally parallel

to and substantially contiguous with the working face 12 of the plow 2, as shown in Fig. 5, so that the compressed material 38 is compacted in a generally vertical plane and any cavity under such material is eliminated. Consequently, when the plow 2 is withdrawn or retracted from the compacted or compressed material 38, the latter tends to stay in a compressed mass and does not fall down to any great degree.

The toe plate 8 is movably supported by the plow 2 and according to a preferred embodiment of the invention, the plow 2 is provided with a cutout 9 extending through the bottom of the plow to accommodate the toe plate supporting means. The toe plate 8 has an upper edge 11 which is maintained in engagement with the working surface 12 of the plow 2 and a lower edge 13 which engages, at all times, the floor 14 of the body 1. The cutout or opening 9 is defined at the top by an edge 9A of the plow 2 that is slightly below the lowest position of the upper edge 11 of the toe plate 8 when the latter is in inclined position and at the ends the opening 9 is bounded by edges 9B which are spaced inwardly from the side edges of the plow 2 and the area of the plow between its side edges and the respective edges 9B constitute leg portions 10 integral with the plow 2 and extending to the floor 14 of the body 1, as best shown in Fig. 1.

One or more, preferably a pair, of vertically disposed legs 15 are fixed to the lower back portion 16 of the plow 2 above the opening 9, these legs 15 extending down almost to the floor 14 and substantially spanning the opening 9. Adjacent their lower ends, the legs 15 carry axially aligned bearings 18 within which is journaled a substantially horizontally disposed shaft 17 having one or more arms 19 fixed therewith. Preferably, there are a pair of arms 19 which are in parallel relation and at their free ends, these arms are each connected by a pivot 21 with a link 20 which is, in turn, connected by pivot means 22 with the rear of the toe plate 8, preferably near the lower edge 13 thereof.

Each associated arm 19 and link 20 forms a collapsible brace that is spring biased in one direction, as by a spring 25 coiled about the pivot 21 and having its ends 26 and 27 anchored to the link 20 and arm 19, respectively, as shown in Fig. 7, to force the lower edge 13 of the toe plate 8 away from the lower end of the plow 2. Each brace is limited in its spring biased movement by mutually engageable abutments or stops 28 and 28' carried by the arm 19 and link 20, respectively, adjacent the pivot 21 to retain the brace in an extended position and prevent the pivotal connection 21 thereof from passing into or beyond center, as shown in Fig. 4. It will be noted that the abutments 28, 28' limit the brace to an angular relation and preclude the arm 19 and link 20 from assuming alignment which might inhibit or preclude collapsing of the brace.

Means are provided for retaining the upper edge 11 of the toe plate 8 in engagement with the working face 12 of the plow 2 regardless of the relative position and angle of the plate 8 to the plow 2. This means is shown as including one or more, preferably a pair, cables 29 having one end 30 connected to the back of the plate 8 adjacent its upper edge 11 and the other end 31 connected to one end of a spring 32 having its other end 34 anchored to the back of the plow. Preferably, each cable 29 is trained over a pulley 35 journaled on one of the legs 15 so that the pull of the cable on the plate 8 will be in a more or less horizontal direction.

The toe plate 8 is provided on its working face with vertically extending reinforcing ribs 24 and across its back with horizontally extending bars 23 and 23'. Similarly, the plow 2 is provided on its back with horizontal bars 33 and 33'. The cables 29 have their ends 30 connected with the upper cross-bar 23 on the plate 8 while the upper ends 34 of the springs 32 are anchored to the upper bar 33 on the plow 2, and the lower cross-

bar 33' provides upper attachment points for the legs 15. The width of the toe plate 8 is preferably substantially identical with that of the opening 9 in the plow 2, and the cross-bars 23, 23' are of a width or depth to abut the legs 15 when the plate 8 is collapsed or retracted so as to retain the plate substantially contiguous with the working surface 12 of the plow 2 and prevent its passing into or through the opening 9, as shown in Fig. 5. In addition, the upper bar 23 is positioned so that it is closely juxtapositioned to the edge 9A when the toe plate 8 is folded or swung to its vertical collapsed position and thereby prevents the plate from slipping upwardly which would enable material to be squeezed under the lower edge 13.

If the width of the toe plate coincided with that of the plow 2, it would be necessary to recess its edges to accommodate the channels or guideways 4 and enable the angular movement of the plate. As such recesses would permit the passage of material or refuse behind the plate and between the plate and plow legs 10, it is preferred that the width of the toe plate 8 be less than that of the plow and coincide with that of the opening 9. To prevent passage of material around the ends of the plate 8 and through the opening 9, the plate 8 is provided with end shields 36 along its end edges and extending from the back thereof in telescopic relation with the inner edges 9B of the legs 10. As the shields 36 must terminate short of the full height of the plate 8 to be accommodated by the opening 9, cooperative triangular shields 37 are fixed on the working face 12 adjacent each edge 9B and extending slightly above the edge 9A, as shown in Figs. 1 and 4-6. The lower edges of the shields 37 overlap the upper edges of the adjacent shields 36, as shown in Fig. 5.

In operation, when the plow 2 is retracted to that material can be loaded into the body 1 in front of the working face of the plow, the springs 25 spread the braces 19-20 to push the lower edge 13 of the toe plate 8 forwardly of the plow, while the springs 32 and cables 29 bias the upper edge 11 of the toe plate 8 against the working face 12 of the plow so that the toe plate 8 assumes the inclined position shown in Fig. 4. It will be understood that the springs 25 bias the relatively opposite ends of the arms 19 and links 20 apart and tend to swing the respective arms 19 and links 20 into alignment. Before the respective arms 19 and links 20 can reach alignment, however, their respective stops 28, 28' come into abutment to retain them in slight angular relation.

After a certain amount of material is loaded into the body 1, the plow 2 is then advanced toward the discharge end 53 in the direction of the arrow 39 in Fig. 4, and the inclined toe portion scoops or cams the material upwardly from the body floor 14 to the upper portion 40 of the body until the newly packed material becomes a part of the mass of packed or compressed material 38. Upon engagement with the mass 38, the reactive pressure on the toe plate 8 overcomes the bias of the springs 25 sufficiently to collapse the braces 19-20, that is, cause the respective arms 19 and links 20 to swing toward each other about their mutual pivots 21 in opposition to the springs 25, and permit the toe plate 8 to swing from its inclined position, Fig. 4, back toward and into contiguous relation with the plow 2, Fig. 5.

As the toe plate 8 is forced back, a part of the material of the mass 38 is squeezed downwardly in front of the toe plate to fill the undercut or cavity 41, Fig. 4, while retaining the material packed at the upper portions 40. When the toe plate 8 is fully collapsed, the pressure face of the mass 38 extends substantially vertically and is packed from the floor 14 upwardly the full height thereof. Consequently, upon retraction of the plow 2 from the mass 38, there is very little tendency of the material to fall from the mass. As the plow 2 is retracted, the springs 25 again bias the arms 19 and their respective

5

links 20 apart to swing the bottom 13 of the toe plate 8 away from the plow 2 and position the plate in its inclined position.

Although a certain specific embodiment of the invention has been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except insofar as is necessitated by the prior art and by the spirit of the appended claims.

I claim:

1. A packing device for refuse truck bodies adapted to receive loose refuse material to be packed at one end thereof, said packing device comprising a plow in a substantially upright position transversely of the body and reciprocally movable in the body longitudinally thereof, said plow including a substantially flat main portion having a pressure face and a substantially flat toe portion across the lower part of said main portion on the pressure side thereof, said toe portion having a lower edge engageable with the floor of the body and said toe portion normally being inclined downwardly and forwardly of said main portion to force some of the loose material upwardly when the plow is moved toward the packing position, and collapsible means connecting said toe portion to said main portion and including spring biased mechanism normally maintaining said toe portion in its inclined relation with the upper edge portion of said toe portion engaging said main portion and the lower edge portion of said toe portion engaging the body floor, said

6

collapsible means including an arm pivotally connected at one end to said main portion and pivotally connected at its other end to a link with the other end of the link pivotally connected to the lower part of said toe portion, stop means on said link and arm to prevent the arm and link from assuming a straight line or dead center position, a spring urging the arm and link toward a straight line position, and spring means connected between the upper part of said toe portion and said main portion and biasing the upper edge portion of said toe portion into engagement with said main portion while permitting vertical and angular movement therebetween.

2. A packing device as defined in claim 1 comprising end plates attached to the sides of said toe portion and shields attached to said main portion in contact with said end plates to prevent refuse from getting between the toe portion and main portion and behind the plow.

References Cited in the file of this patent

UNITED STATES PATENTS

200,131	Cousland	Feb. 12, 1878
872,850	Rowekamp	Dec. 3, 1907
2,055,291	Henry	Sept. 22, 1936
2,298,747	Agar	Oct. 13, 1942
2,387,535	Sewell	Oct. 23, 1945
2,541,538	Newell	Feb. 13, 1951
2,693,890	Bridge	Nov. 9, 1954