

Sept. 23, 1958

H. W. JONES

2,853,204

CLOSURE SEALING MEANS FOR SUMP-TYPE CONTAINERS

Filed Aug. 20, 1954

3 Sheets-Sheet 1

Fig. 1.

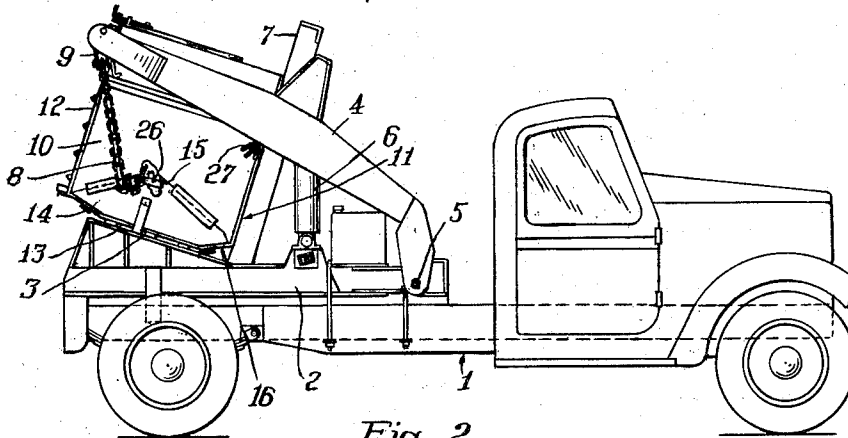
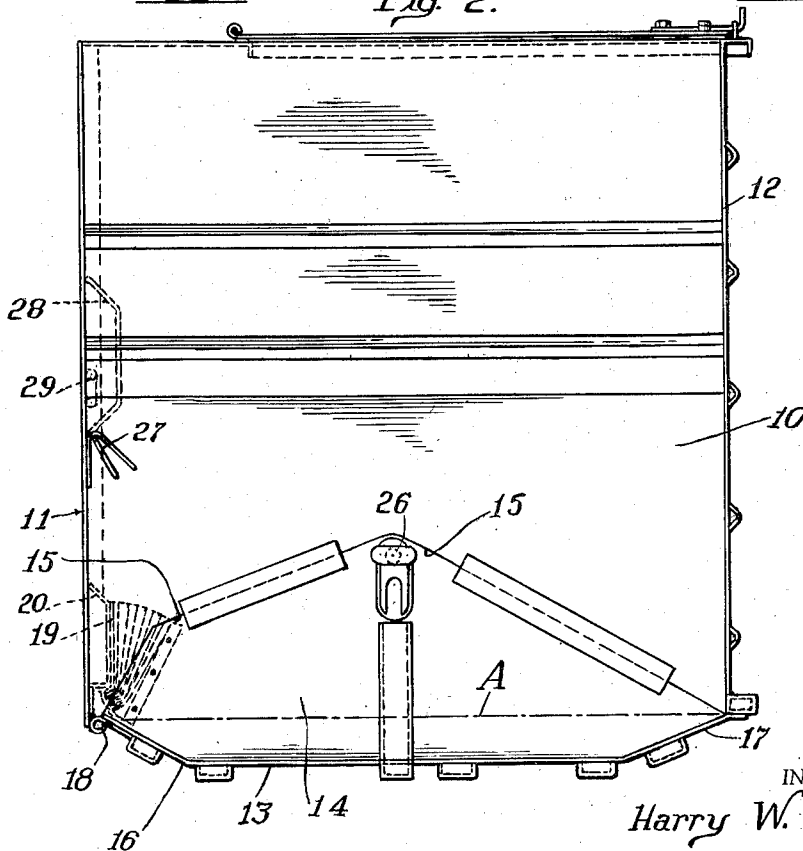


Fig. 2.



INVENTOR

Harry W. Jones

BY *Cyrus Kehr & Swicker*

ATTORNEYS

Sept. 23, 1958

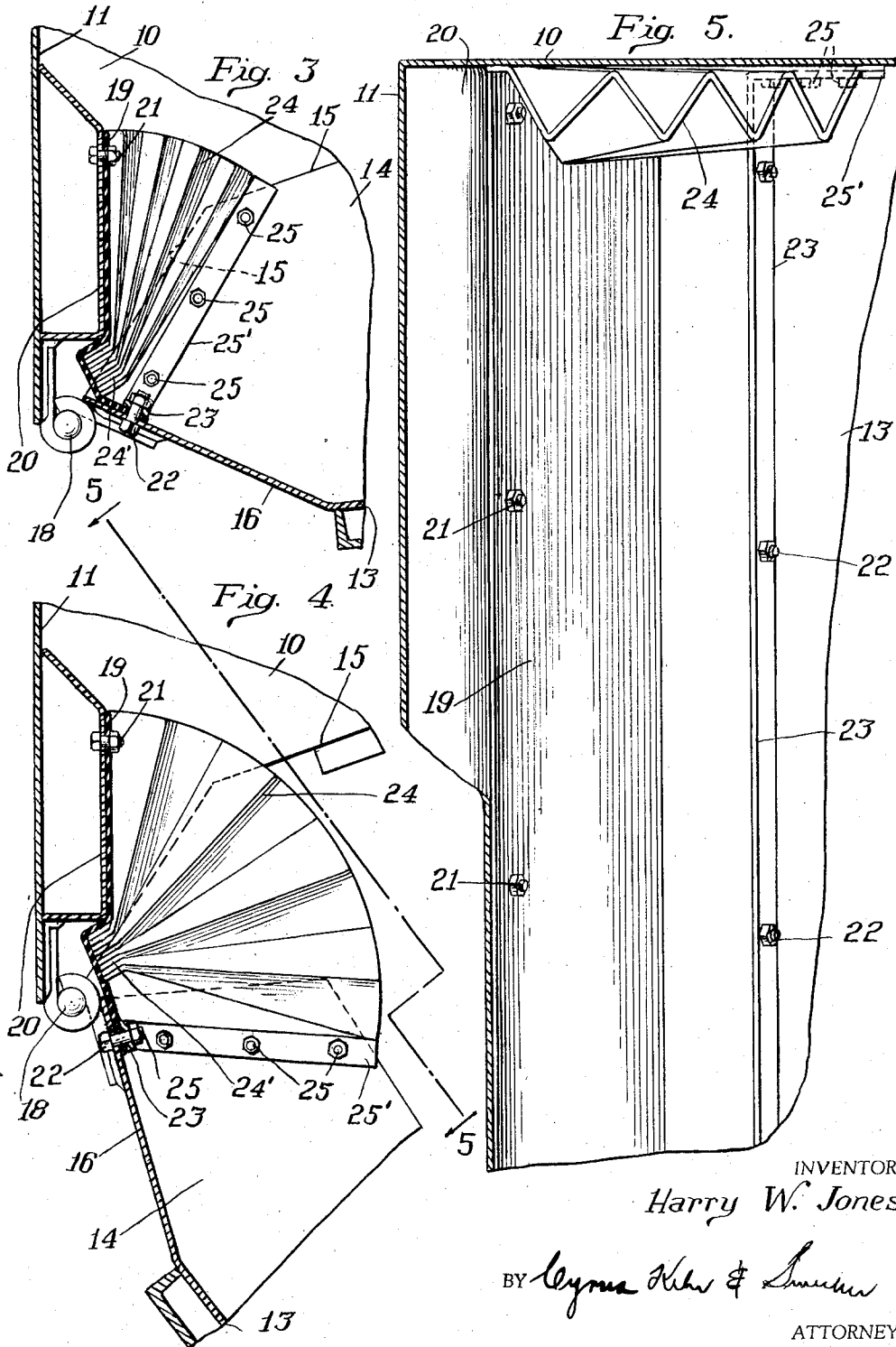
H. W. JONES

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Filed Aug. 20, 1954

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INVENTOR

Harry W. Jones

BY *Lynna Kline & Smith*

ATTORNEYS

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H. W. JONES

2,853,204

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Filed Aug. 20, 1954

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Fig. 6.

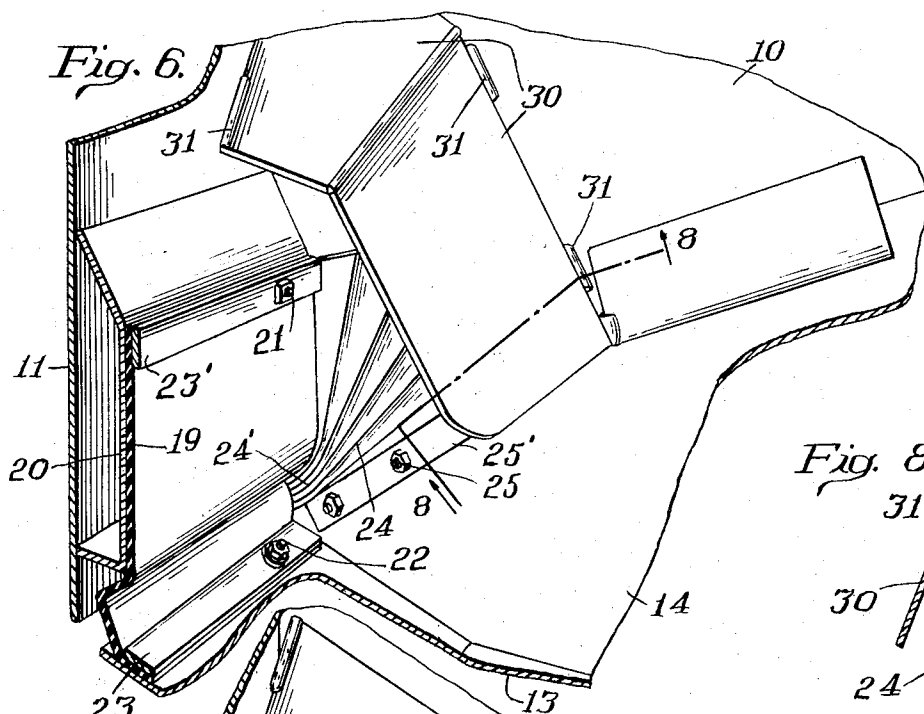


Fig. 7.

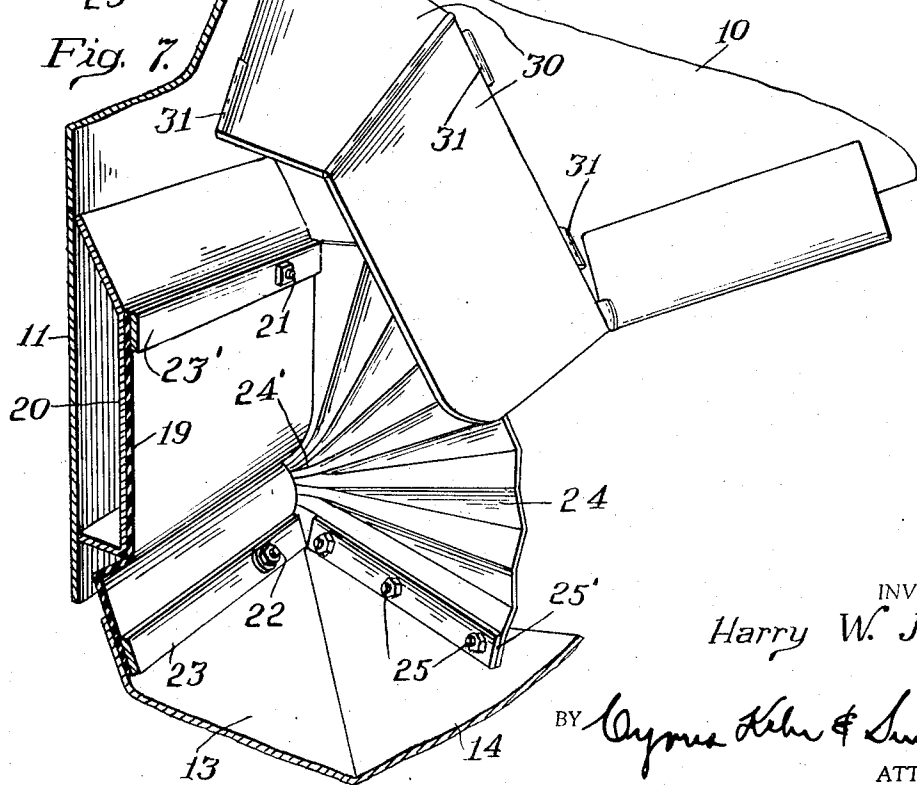
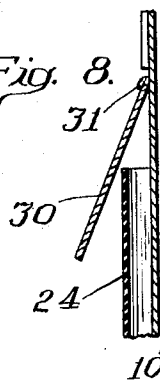


Fig. 8.



INVENTOR
Harry W. Jones

BY *Byron K. Kuhn & Associates*
ATTORNEYS

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2,853,204

CLOSURE SEALING MEANS FOR SUMP-TYPE CONTAINERS

Harry W. Jones, Knoxville, Tenn., assignor to Dempster Brothers, Inc., Knoxville, Tenn., a corporation of Tennessee

Application August 20, 1954, Serial No. 451,180

16 Claims. (Cl. 220—32)

This invention relates to improvements in closure sealing means for sump-type containers, and more particularly to the type of containers used for trash, garbage, and other refuse.

It has been customary to handle refuse containers with transporting and dumping equipment of the types set forth in the patents of George R. Dempster, No. 2,281,183, April 28, 1942, and No. 2,369,722, February 20, 1945, as examples of such equipment. Such containers customarily are filled while sitting on the ground or on the floor, street, etc., and thereafter may be picked up by the transporting and dumping equipment on a motor vehicle, on which the container may be transported to the point of dumping, the contents discharged, and the container then returned or hauled to the point of re-use. Frequently, a considerable quantity of liquid may be received in the container, especially when hauling garbage and other materials, but when the container has a drop bottom as in Patent No. 2,369,722, and is tilted forward on the vehicle in its transport position, the liquid spills out. Furthermore, some of the liquid may leak out at the point of filling and contaminate the spot around the container so as to be highly objectionable in service.

One object of this invention is to retain a considerable quantity of liquid within the container while sitting in its position to be filled, and then later, when the container is raised and tilted forward on the transporting equipment in its carrying position, the liquid is retained in the container without danger of leaking out.

A further object of the invention is to provide in a drop bottom container a sump at or adjacent the point of connection of the drop bottom door with the body of the container which will receive and enclose the liquid contents thereof and with means to prevent leakage through the crack between the door and container when the container is tilted in carrying position.

Still another object of the invention is to provide for the sealing of the crack between a drop bottom door and the body of a container on which it is used against the leakage of the contents therefrom when the container is tilted in carrying position.

These objects may be accomplished according to one embodiment of the invention by constructing a drop bottom container with a sump therein which normally contains liquid. This sump includes a receptacle provided on the drop bottom door adjacent the point of pivotal connection between the edge of the door and the body of the container and having means to seal the crack adjacent the pivotal connection which will trap the liquid in the container against leakage when the container is tilted in its carrying position on the vehicle. This provides a leak-proof sump with a receptacle of substantial quantity that will allow the container to tip forward to a considerable degree without leakage through the crack between the door and the body of the container.

Provision may be made for sealing the crack between the body of the container and the drop bottom door and

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to shed the contents of the container into the sump provided in the drop bottom door as the latter is opened. A boot or cover of elastic or resilient material preferably is used for this purpose, having respective flaps, and said cover is secured to the body of the container along the front wall thereof and to the adjacent edge of the drop bottom door, with the ends closed and sealed to the end walls of the container by bellows sections which will open and close in response to the corresponding movements of the drop bottom door.

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

Fig. 1 is a side elevation of a transporting and dumping unit, showing the improved container in place thereon and in tilted position;

Fig. 2 is an end elevation of the container detached and sitting on the ground or floor;

Fig. 3 is a detail cross section therethrough, showing the boot in place therein, and with the bottom door closed;

Fig. 4 is a similar view showing the drop bottom door in open position;

Fig. 5 is a longitudinal section therethrough, substantially on the line 5—5 in Fig. 4;

Fig. 6 is a detail perspective view of the inside of the container, with the door closed;

Fig. 7 is a similar view with the door open; and

Fig. 8 is a detail cross section therethrough, taken on the line 8—8 in Fig. 6.

The invention is shown as applied to transporting and dumping equipment of the character generally represented in the Dempster Patent No. 2,369,722, February 20, 1945, merely as an example of the type of equipment in connection with which it may be used.

This transporting and dumping equipment includes a motor vehicle chassis generally designated by the numeral 1, upon which is mounted a hoisting unit, comprising a sub-frame 2 having a container rest or seat, generally indicated at 3 mounted thereon and inclined forwardly of the motor vehicle. Boom arms are shown at 4, pivotally mounted at 5 at their forward ends to the sub-frame 2 and adapted to be raised and lowered by hydraulic hoists 6.

A carriage having a skid frame is shown at 7 mounted on the sub-frame 2 for bodily movement lengthwise relative thereto between the position shown in Fig. 1 and a rearward position in which the container may be lowered away from the rest 3. Suitable means is provided for moving the skid frame 7 forward and rearward of the chassis, as described more fully in the Dempster patents referred to above. The free ends of the boom arms 4 support the container by flexible devices such as chains 8, attached to the boom arms at 9 to raise and lower the container to and from its dumping position. The skid frame on the carriage 7 is also provided with a dumping hook (not shown) to be engaged with the container for dumping the latter.

The foregoing transporting and dumping equipment, generally as described above, is set forth and disclosed more fully in the Dempster patents referred to, particularly No. 2,369,722.

The container illustrated as an embodiment of this invention, for use with the transporting and dumping equipment, is shown in Fig. 1 and more fully in Figs. 2 to 8. This container is constructed preferably of sheet metal of relatively heavy gauge, according to the size and capacity of the container and the material to be contained therein, but is substantially of rigid unitary structure. End walls are shown at 10; front and back walls at 11 and 12; and a bottom at 13, all being formed of suitable steel plates or the like, and surrounding walls 10, 11 and 12 are rigidly connected together as by weld-

ing, or other fastening means to form an upright enclosure or container body.

The bottom 13 is shown as provided with upturned end sections 14 formed rigidly therewith in positions to fit into cutout notches 15 provided in the end walls 10 of the container, and may be made as usual by notching out the end plates, using the cutout portions to form the end sections 14 of the bottom 13, or forming said ends on the bottom plate.

The bottom 13 is also provided with upwardly inclined forward and rearward edge portions 16 and 17, respectively, which cooperate with the end sections 14 to provide a sump in the drop bottom 13 for containing liquid therein.

The drop bottom 13 is hinged to the front wall 11 of the container at 18, along the upper edge of the inclined portion 16, as shown more clearly in Figs. 2 to 4. The drop bottom 13 may be lowered about the hinge 18 to the open position shown in Figs. 4 and 7 for dumping the contents of the container.

The hinge connection 18 between the drop bottom 13 and the body of the container would leave a crack therebetween at the hinged edge of the drop bottom door 13. I provided a boot or cover to close this crack between the drop bottom door 13 and the front wall 11 of the container with provisions for sealing the boot or cover to the door, front wall and adjacent portions of the cutouts 15 in the end walls 10 of the container.

The boot or cover preferably comprises a sheet of elastic or resilient material, generally indicated at 19, overlapping at one edge the rear edge portion of the inclined section 16 of the drop bottom door, and at the opposite edge said sheet of material preferably is secured to the front wall 11 of the container. In the example illustrated, a baffle 20 extends lengthwise of the front wall 11 adjacent the lower edge thereof, and the boot or cover 19 is in face-to-face engagement with said baffle 20 while the latter is welded or otherwise sealed to the front wall 11.

Any suitable resilient material may be used for this purpose, such as real or artificial soft rubber. A material which has been found satisfactory for the purpose is an artificial rubber sold under the trade name "neoprene." This material has sufficient resiliency to allow freedom of swinging movement of the drop bottom door 13 to open and closed positions and responds readily thereto and serves as an effective seal for the crack between the door and the front wall of the container.

The boot or cover sheet 19 should be secured by fastenings to both the drop bottom door 13 and the front wall 11. It may be sealed thereto also by adhesive under its edges. A row of bolts is shown at 21 for securing the upper edge of the sheet 19 to the baffle 20, being spaced along said edge and securely anchoring the sheet thereto. In like manner, bolts 22 may be used for securing the bottom edge of the boot or cover 19 upon the rear edge of the door 13. The bolts 22 preferably extend through a relatively thin strip of sheet metal 23 which cooperates with the bolts to clamp said bottom edge to the door 13. The top edge of the sheet 19 also may be clamped by bolts and a strip, as indicated at 23' in Figs. 6 and 7, if desired.

The ends of the boot or cover are closed by flaps or sector-shaped pieces 24 which are preferably formed of the same material as the boot or cover 19 and may be molded in one integral piece therewith or formed of separate pieces adhesively secured or otherwise sealed to said bottom sheet 19. The end pieces 24 are preferably pleated or corrugated for opening and closing expanding movements alternately to the points shown in Figs. 3 and 4. One edge of each end piece 24 should be sealed effectively to the adjacent face of the boot or cover sheet 19 of the boot, while the opposite edge is preferably secured to the end section 14 of the door 13,

not only by adhesive, but also by bolts 25 and a clamping strip 25' overlapping the edge of the segment 24. The sector-shaped pieces 24 of pleated elastic material obtained by drawing the lower ends thereof together at 24' and securing these with adhesive or otherwise.

Deflector plates 30 may be used to shield the pleated or corrugated pieces 24, if desired, as shown in Figs. 6 to 8. These are omitted in Figs. 3 to 5 for clearness of illustration, but preferably are employed. Each of the deflector plates 30 extends along the inner face of the end wall 10 from the front or bail wall 11 of the container substantially to the cutout 15. The deflector plate 30 is welded or otherwise secured at intervals along its edges to adjacent portions of the container, as indicated at 31.

As shown in Fig. 8, each plate 30 is directed laterally from the end wall 10 at an acute angle thereto. These plates 30 extend beyond the boot or cover pieces 24 when the door is closed, and when the pieces are extended as the door is opened (see Fig. 7), the pleats or corrugations pull out from under the deflector plates, and then are folded back under the plates upon closing of the door (see Fig. 6).

Lifting pins are provided at 26 on the end sections 14 of the door 13 for detachably engaging the free ends of the chains 8 to lift the container from its filling position on the ground or other surface onto the carriage or skid frame 7 and to hold the container in dumping position, as well as for handling the container generally.

As set forth more in detail in the above-mentioned Dempster patents, the carriage or skid frame 7 is provided with one or more dumping hooks thereon for engaging the body of the container for dumping. The front wall 11 is shown as provided with an indentation therein, generally indicated at 28, within which is located a cross bail 29 adapted to be engaged by the hook (not shown) on the skid frame 7 to hold the body of the container elevated, for dumping of the contents upon lowering of the drop bottom door 13.

The container may be open at its top or provided with any suitable closure or doors therefore as desired, according to the material to be handled therein and the desirability for enclosing such material.

The container is adapted to be loaded, transported and dumped substantially as set forth more fully in the Dempster patents referred to above, particularly No. 2,369,722. When the container is sitting in its level position on the ground during filling, as illustrated in Fig. 2, the sump provided in the door 13 will contain a considerable quantity of liquid therein, having a liquid level which is at the height of the upper edges of the inclined portions 16 and 17, as indicated at A in Fig. 2. For one size of container, this sump will hold 110 gallons of liquid.

When the same container is lifted from its level position, shown in Fig. 2, to a position in which it rests against the carriage or skid frame 7, as shown in Fig. 1, it will be noted that the body of the container tilts forward of the vehicle through at least 15½ degrees in its carrying position. Inasmuch as a crack would be formed at the point of the hinged connection 18 between the drop bottom door 13 and the body of the container along the front wall 11, if no seal were provided for this crack, the liquid contents would spill out of the container almost entirely in tilting the container to the position shown in Fig. 1, with only a very small quantity of the liquid remaining therein.

The provision of the boot or cover 19-24 will seal the crack between the door 13 and the front wall 11 of the container against the leakage therethrough of liquid within the container, and also prevent leakage through the forward portion of the cutout 15, inasmuch as the latter is sealed by the end pieces 24 of the boot, as will be apparent from Figs. 3, 5 and 6. However, upon opening of the door to the position shown in Fig. 4 or Fig. 7,

the boot or cover will expand at the end pieces 24 and shed the material over the drop bottom door 13, for effective discharge of the contents of the container.

In this way I provide an effective leakproof sump that will retain all of the liquid contents of the container, even during transportation of the latter, in an inclined or tilted position, and yet will discharge the contents fully and effectively when desired.

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 as set forth in the claims.

I claim:

1. A container comprising a container body including a front wall and spaced end walls, a drop bottom door substantially closing the bottom of the container, said door having upturned end sections, means forming a hinged connection between the door and the body substantially at the lower edge of the front wall with a crack between said door and the front wall, sealing means extending along said crack between the edge portion of the door and the front wall, said sealing means being elastic and maintaining the sealing relation with said crack against the leakage of liquid from the sump through the crack, and means at opposite ends of the sealing means in sealing relation with the upturned end sections when the door is closed.

2. A container comprising a container body including front and rear walls and spaced end walls, a drop bottom door substantially closing the bottom of the container and having a sump formed therein, said door having upturned end sections adjacent the end walls, means forming a hinged connection between the door and the body substantially at the lower edge of the front wall with a crack between the door and the front wall, sealing means extending along said crack between the door and the front wall on the inner side of the container relative to the crack, said sealing means being elastic and maintaining the sealing relation with the crack against the leakage of liquid from the sump through the crack, and means at opposite ends of the sealing means in sealing relation with the upturned end sections when the door is closed.

3. A container comprising a container body including front and rear walls and spaced end walls, a drop bottom door substantially closing the bottom of the container and having a sump formed therein, said door having upturned end sections adjacent the end walls, means forming a hinged connection between the door and the body substantially at the lower edge of the front wall with a crack between the door and the front wall, sealing means extending along said crack between the door and the front wall on the inner side of the container relative to the crack, said sealing means being elastic and maintaining the sealing relation with the crack against the leakage of liquid from the sump through the crack, and additional sealing means at opposite ends of the first-mentioned sealing means in sealing relation between the end walls and upturned end sections when the door is closed.

4. A container comprising a container body including front and end walls and a bottom door hinged to the body of the container adjacent the front wall and having a crack along the hinged edge of the door, and means forming a cover overlapping said crack between the crack and the interior of the container, said cover including a flexible sheet of material secured at one edge to the front wall and at the opposite edge to the door, and pieces at opposite ends of said sheet adjacent the end walls and secured, respectively, to the front wall and door at opposite edges of the pieces in positions to expand upon opening movement of the door.

5. A container comprising a container body including front and end walls and a bottom door hinged to the body of the container adjacent the front wall with a crack therebetween, a baffle extending along the lower edge of the front wall on the inner side thereof and se-

cured thereto, means forming a cover overlapping the crack between the crack and the interior of the container including a sheet of resilient or elastic material sealed at opposite edges of the sheet to the baffle and to the upper face of the door adjacent the hinged edge thereof, fastenings securing the sheet to the baffle and door, respectively, at opposite edges of the sheet, said sheet having end pieces at opposite ends thereof adjacent the end walls and secured to the door and to the container body at opposite edges of the end pieces for closing the crack at opposite ends of the crack.

6. A container comprising a container body including front and end walls and a bottom door hinged to the body of the container adjacent the front wall with a crack therebetween, means forming a cover overlapping the crack between the edge of the door and the interior of the container, said cover including a sheet of resilient material sealed to the front wall and upper face of the door adjacent the hinged edge thereof, fastenings securing the sheet to the front wall and door, respectively, at opposite edges of said sheet, and sector-shaped pieces of pleated elastic material secured to said sheet at opposite ends thereof and extending along the end walls of the container in positions to expand upon opening movement of the door, and means for securing each of the sector-shaped pieces at one edge to the container body and at the opposite edge to the door.

7. A container comprising front, rear and end walls, a bottom door having a sump therein and having upstanding opposite ends, means for hinging the door at one edge thereof to the front of the container, said container having a baffle extending along the front wall at the inner side thereof and adjacent the lower edge of said front wall, a sealing sheet overlapping the hinged edge of the door and extending upwardly therefrom to the baffle, means for securing opposite edges of the sheet to the door and baffle, respectively, pieces of resilient or elastic material at opposite ends of the sheet, and means for securing each of the pieces to the baffle and upturn opposite ends of the door, respectively, on opposite sides of the hinged edge of the door.

8. A container comprising a container body including front and end walls and a bottom door hinged to the body of the container adjacent the front wall with a crack therebetween, means forming a cover overlapping the crack including a sheet of resilient material sealed to the front wall and upper face of the door adjacent the hinged edge thereof, fastenings securing the sheet to the baffle and door, respectively, at opposite edges of the sheet, sector-shaped pieces of pleated elastic material at opposite ends of the sheet and extending along the end walls of the container in positions to expand upon opening movement of the door, means for securing each of the sector-shaped pieces at one edge to the front wall and at the opposite edge to the door, and a deflector plate secured to each end wall spaced above and overlapping each sector-shaped piece protecting the latter in the closed position of the door.

9. A container having a front wall and spaced end walls, a drop bottom door having upwardly extending end wall portions, said door hinged at one edge thereof to the front wall, a cover having a central portion extending along said hinged edge of the door in sealing engagement with the front wall and door, said cover at the outer ends thereof having laterally extending portions overlying lower portions of the spaced end walls forming a pocket with the central portion, said lateral end portions of the cover being in sealing engagement with said front wall and the upwardly extending end wall portions of the door and being arcuately extensible about said hinge.

10. A container comprising a front wall and spaced side walls, a drop bottom door covering a substantial portion of the bottom opening of said container, said door having a sump therein for receiving liquid with an upwardly extending edge portion hinged to the adjacent

lower edge of the front wall of the container with a crack therebetween, a cover extending along said crack in sealing engagement with said front wall and inclined edge portion of the door, said cover having lateral means at the side edges overlying lower edge portions of said side walls, said means being in sealing engagement with the front wall and opposite side edges of the door and being extensible arcuately about said hinge.

11. A container comprising a container body including a front wall and spaced end walls, a drop bottom door substantially closing the bottom of the container, said door having upturned end sections, means forming a hinged connection between the door and the body substantially at the lower edge of the front wall with a crack between said door and the front wall, and with cracks between the upturned door sections and the end walls, a strip of resilient sealing material extending lengthwise of the first-mentioned crack overlapping the adjacent portion of the door and body on opposite sides of the crack in sealing relation thereover and at the inner side of the container, said sealing material being elastic and maintaining the sealing relation over the first-mentioned crack, sections of resilient and elastic material extending upwardly from the door along the portions of the second-mentioned cracks adjacent opposite ends of the first-mentioned crack and overlapping the second-mentioned cracks in sealing relation therewith when the door is closed, and means for securing the sealing materials to the container body.

12. A container comprising a front wall and spaced end walls, a drop bottom door having upwardly extending end wall portions, said door covering a substantial portion of the bottom opening of said container, said door having a sump therein for receiving liquid with an upwardly extending edge portion hinged to the adjacent lower edge of the front wall of the container with a crack therebetween, a cover over said crack in sealing engagement with said front wall and upturned edge portion of the door, said cover being elastic and maintaining the sealing relation over the crack, said cover having lateral means at the opposite ends of the crack overlapping lower edge portions of said end walls, said means being in sealing engagement with the front wall and the upwardly extending end wall portions of the door when the door is closed.

13. A container comprising a container body including a front wall and spaced end walls, a drop bottom door closing the bottom of the container, said door having an upwardly inclined forward edge portion and having upturned end sections which form a sump in the door, means forming a hinged connection between the door and the body substantially at the lower edge of the front wall with a crack between said inclined door portion and the front wall, and sealing means extending along said crack between the inclined edge portion of the door and the front wall and sealing said crack against the leakage of liquid from the sump through the crack when the door is closed, said sealing means being elastic and maintaining the sealing relation over the crack.

14. A container comprising a container body including a front wall and spaced end walls, a drop bottom door closing the bottom of the container, said door having an upwardly inclined forward edge portion and having up-

turned end sections which form a sump in the door, means forming a hinged connection between the door and the body substantially at the lower edge of the front wall with a crack between said inclined door portion and the front wall, and sealing means extending along said crack between the inclined edge portion of the door and the front wall and sealing said crack against the leakage of liquid from the sump through the crack when the door is closed, said sealing means being elastic and maintaining the sealing relation over the crack, and means extending upwardly from said sealing means at opposite ends thereof and overlapping the adjacent edge portions of the body end walls in sealing relation therewith when the door is closed.

15. A container comprising a container body including a front wall and spaced end walls, a drop bottom door closing the bottom of the container, said door having an upwardly inclined forward edge portion and having upturned end sections which form a sump in the door, means forming a hinged connection between the door and the body substantially at the lower edge of the front wall with a crack between said inclined door portion and the front wall, and with cracks between the upturned door sections and the end walls, a sealing device extending lengthwise of the first-mentioned crack in sealing relation thereover at the inner side of the container, said sealing device being elastic and maintaining the sealing relation over the first-mentioned crack, said sealing device having upturned opposite end sections extending upwardly from the door along the portions of the second-mentioned cracks adjacent opposite ends of the first-mentioned crack in sealing relation over the second-mentioned cracks when the door is closed, and means for securing the sealing device to the container body.

16. A container comprising a container body including a front wall and spaced end walls, a drop bottom door substantially closing the bottom of the container, said door having upturned end sections, means forming a hinged connection between the door and the body substantially at the lower edge of the front wall with a crack between said door and the front wall, and with cracks between the upturned door sections and the end walls, a sealing device extending lengthwise of the first-mentioned crack in sealing relation thereover at the inner side of the container, said sealing device being elastic and maintaining the sealing relation over the first-mentioned crack, said sealing device having upturned opposite end sections extending upwardly from the door along the portions of the second-mentioned cracks adjacent opposite ends of the first-mentioned crack in sealing relation over the second-mentioned cracks when the door is closed, and means for securing the sealing device to the container body.

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