A rectangular transcontainer for flowable goods, comprising a frame closed in itself and a tank liquid-tight on all sides, wherein part cylindrical outwardly cambered wall elements are connected to said frame in such a manner as to form therewith a liquid-tight box girder resistant to bending, twisting and buckling, the connections and fittings for access to the interior of the tank being located within the contour of said frame.

33 Claims, 19 Drawing Figures
RECTANGULAR FREIGHT CONTAINER FOR
INTERNATIONAL COMBINED TRAFFIC,
PARTICULARLY FOR FLOWABLE BULK GOODS

BACKGROUND OF THE INVENTION

The present invention relates to a rectangular freight-container for international combined traffic (hereinafter referred to as “transcontainer” or briefly as “container”), designed particularly for flowable bulk goods.

As well known, the main advantage of the container transport of piece goods consists in dispensing with transloading work in ports, railway yards and lorry transloading terminals, since the containers as a whole can be loaded as units in a very short time without intermediate transport or storage of the goods contained therein and without having to touch the plurality of individual freight pieces.

It is obvious to make use of the advantages in saving time, better utilization of space and weight as well as exchangeability of the transport means likewise in the transport of bulk liquids. The transport of liquids and other flowable goods offers, however, special problems as compared with the transport of piece goods or coarse grained bulk goods. These problems consist particularly in their generally high specific weight as compared with piece goods, the liberation of inertia forces within the container, when accelerating, braking or in curves owing to the movements of their own of the liquids to be transported as well as increased risk of overturning owing to the high specific weight and inertia forces, when the center of gravity of the entire mass of the vehicle, particularly road vehicles, lies too high.

Hitherto bulk transport of liquids has been made generally in tanker ships, railroad tanker trucks, tanker lorries, or in tanks placed on normal platform trucks, or in box-shaped small containers, which could be placed on normal platforms.

For a change-over to trans-container traffic, low liquid contain- ers of the usual construction having circular or oval cross- sections have been fitted into box-shaped standard containers with stiff frames, such as described e.g. in a prospectus of the firm Sea-Land Service, Inc. The cross-section of the container thus should form a square or rectangle circumscribed to the cross-section of the liquid tank. A rectangular shape is preferable since when loading a liquid having the metric specific weight of 1 the utilization of a square standard cross-section of 2,435 x 2,435 mm (8 feet x 8 feet) would exceed the tank loads permitted for the actual standard lengths for which the standardized loading equipment in ports and other trans-loading places are provided.

The possibilities offered by the use of liquid transcontainers even considerably exceed the known advantages of normal piece good containers. Normally transcontainers having a single chamber have been used for a unit liquid charge. Accord- ingly liquid transcontainers with their contents can be deposited at their destination as storage tanks, in exchange for corresponding empty transcontainers. The construction of special storage containers on the site is no longer required.

While the transport of flammable and non-flammable liquids was possible hitherto only by the aid of expensive and often custom-built tank-saddle vehicles, the use of trans- containers for fuel and other liquids permits the use of the same motor vehicles as can be used also for the transport of other containers and loads. Instead of an expensive tank saddle vehi- cle, shipping and forwarding operators can transport solid or liquid goods according to requirements by the aid of liquid trans-containers with the use of the same vehicle.

The known liquid containers comprising a cylindrical or oval liquid tank mounted in a square or rectangular piece goods container have, however, inter alia the disadvantage that the container space is not fully exploited since unused wedge shaped spaces remain empty at the eight corners outside the circular or oval sections enclosing the liquid tank. The unused space is further increased by the spacing required between the outer boundaries of the container and the extreme points of the cylindrical or oval tank body. Thus 40 to 50 percent of the total volume available remain unused.

For this reason parallelepipedon-shaped liquid tanks, the useful volume of which approximates as much as possible the prescribed outer boundaries of the container are preferable to those of circular or oval cross-section.

Such constructions may be based on the experience gained hitherto in the construction of stationary self-supporting box-shaped liquid tanks. In view of the inertia forces occurring upon movements of a vehicle or ship the stability of the walls (pressure resistance) has an importance which exceeds that of stationary rectangular tanks. The same applies to any surge baffles and internal partition walls as well as to built-in struc- tures for reducing the so-called free liquid surface areas.

While the walls of stationary box-shaped liquid tanks have merely to stand a certain test pressure, transcontainers must additionally afford a certain stacking possibility. Since support reaction forces occur at the eight corners, a sufficiently stiff construction of the vertical edges is of particular importance. These edges have to be made more resistant to buckling and twisting than those of ordinary box-shaped containers. Since also the hoisting forces when transpositioning the containers are applied to the corners thereof, the container has to be constructed as a whole as a stiff box girder capable of resisting bending; the international standard regulations ISO/TC 104 or DIN 15190 have to be adhered to.

Finally, in view of the liquids to be transported the internal surfaces should be as smooth as possible, in order to allow easy discharging, cleaning and disinfection while avoiding deposited corrosive attack.

With ordinary piece good containers as well as with some stationary liquid tanks often beads of channel or semi-circular section are used for stiffening the walls. Such beads would, however, buckle more readily than cambered walls owing to the special dynamic loading of transcontainers for liquids under otherwise equal conditions, and would tend to per- manent deformations, particularly when the trans-container is filled but partly. Bead profiles would also make the cleaning of the interior of the transcontainer more difficult.

Completely flat walls are in consideration only in conjunc- tion with additional profiles welded to them, involving in- crease in weight, since otherwise they could easily buckle.

BRIEF SUMMARY OF THE INVENTION

The invention has accordingly the object of providing a rectangular freight transcontainer complying with interna- tional standards, for flowable goods, comprising a frame closed in itself consisting of profiled sections, and a tank liquid-tight on all sides, wherein the space available within the prescribed dimensions is better exploited than hitherto, and wherein at the same time the conditions set forth hereinabove can be fulfilled.

This is attained by a transcontainer according to the invention in that outwardly cambered part-cylindrical wall elements are connected to a frame in such a manner that they form together with the latter a box girder which is liquid-tight and resistant to bending and twisting and offers great safety against buckling, and that the required connections and fittings of the access openings of the transcontainer are accommodated within the contours of the said frame.

While in the constructions hitherto known the frame, the liquid tank and the support saddles form separate structural elements, which though fixedly connected to each other have to fulfill different tasks, in the transcontainer according to the invention the frame and the wall elements of the liquid tank are integrated into a unit which can withstand the two main stresses suffered by a freight container for flowable goods simultaneously. One of these stresses results from externally applied substantially static hoisting and support reaction forces, and the other from the substantially dynamic inertia forces originating at the contents of the container. For tak- ing both kinds of stresses according to the invention the frame members as well as the wall elements are used, these two kinds of components mutually assisting each other. This integral construction not only results in an outstanding exploitation of
The term "liquids" covers in this context all flowable goods of every description such as flour, cement and the like.

Furthermore, the profiled sections of the frame extend at right angles to the axes of curvature of the associated wall elements, at least on those faces thereof which are adjacent to curved edges of said wall elements. The curved edges of the wall elements thus meet everywhere corresponding external faces of the frame sections, so that nowhere wall elements of differentcamber can meet one another. Consequently the loading space has no acute angles or wedges. Thus faultless cleaning and internal coating are made possible.

The frame sections are accordingly made preferably as angular profiles of open or closed cross-section, at least so far as they do not run parallel to the axis of curvature of the cambered wall elements. In the case of closed cross-sections they may be used at the same time for heating the contents of the container.

In particular, the frame is preferably composed of four corner struts resistant to buckling and capable of taking the stacking load, and of two upper and two lower longitudinal and transverse beams. Eight corner fittings of cast steel form the junctions of the longitudinal and transverse beams with the corner struts meeting there. Depending on the length and height of the container the longitudinal beams are additionally connected horizontally by intermediate transverse beams and vertically by internal struts. In the lateral and frontal bays of the frame thus formed outwardly cambered wall elements are welded, which considerably increase the section modulus thereof in both axial directions and the stiffness thereof. Major bays are reinforced by additional stiffeners.

The bottom of the container preferably consists of cambered troughs arranged in one or more steps descending towards the sole line and resting on longitudinal bottom stiffeners. The internal partitions are interrupted at sole level to allow complete discharge of any remnants. For the transport of flowable bulk goods, the discharge of which is effected by tipping, the arcs of curvature of the cambered bottom elements may be positioned transversely of the longitudinal axis of the container. In this case the otherwise convenient chamfering of the lower transverse beams for establishing a slide chute surface may be dispensed with. The ceiling consists of several trough-shaped wall elements cambered in the longitudinal or transverse direction, the shape of which safeguards a non-thermal expansion during transport.

When braking and accelerating as well as open ship movements the internal beams have the effect of hampering surging. It is possible without difficulty to build in additional standing or suspended partition walls or surge baffles in the bays formed by the intermediate beams and struts.

According to a development of the invention the manhole required for entering into and for cleaning the interior of the container is provided with a lid, which in contrast to known constructions is cambered inwardly. Consequently it does not protrude beyond the frame contour, and moreover devices for regulating, airing and venting, for measuring etc. may be arranged in the hollow of the lid. Moreover, the internal camber of the manhole lid serves to a limited extent as a spill tray.

The discharge ports and their valves are preferably arranged in a re-entrant portion of an end wall of the container. When the container has to serve for the transport of flowable solid bulk goods and is to be discharged by tipping, oblique guide plates may be provided in the regions of the lower transverse beams and of the end walls, which lead to the discharge opening and prevent the formation of dead associated wall elements.

As the material for the wall elements, particularly stainless chromium-nickel steel alloys are in consideration because of their corrosion resistance. Provided the frame sections are not in contact with the charge, they may be constructed of less expensive carbon steel. If desired, the frame sections may be covered on their faces inside the container with stainless steel sheets. Alternatively coating with synthetic substances is possible. Also light metal alloys are in consideration as materials for the frame sections and wall elements.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS.

Further details of the invention are disclosed in the following description of some embodiments thereof illustrated by way of example in the accompanying drawings, in which:

FIG. 1 is a perspective illustration of a preferred embodiment of the transcontainer according to the invention.
FIG. 2 is a cross-section thereof on the line A—B of FIG. 1.
FIG. 3 is a corresponding cross-section of a slightly modified embodiment.
FIG. 4 is a partial horizontal section on the line C—D of FIG. 2.
FIG. 5 is a partial vertical section on the line E—F of FIG. 2.
FIG. 6 is a section on a larger scale of the discharge device.
FIG. 7 is a section on a larger scale of the lid of the manhole.
FIG. 8 and 9 show details of the connections between struts and wall elements.
FIG. 10 shows a modification for the transport of flowable solid bulk goods.
FIGS. 11 to 14 show various embodiments of strut constructions.
FIGS. 15 to 19 show various possible connections between wall elements.

DETAILED DESCRIPTION

The transcontainer for flowable goods illustrated in FIG. 1 to 7 comprises a closed frame consisting of four corner struts 1 taking the stacking load and resistant to buckling, two lower transverse beams 2, two upper transverse beams 3, two lower longitudinal beams 4 and two upper longitudinal beams 5. Eight corner fittings 6 conforming to the international standards ISO-TC 104 are made of cast steel; they serve for hoisting and anchoring the transcontainer and form the junctions of the longitudinal and transverse beams with the vertical corner struts meeting one another there. Depending on the length and height of the transcontainer the longitudinal beams 4, 5 are additionally connected horizontally by lower intermediate beams 7 and upper intermediate beams 8, and vertically by intermediate struts 9.

The struts and beams are formed in the embodiment illustrated by hollow profiles of substantially rectangular cross-section; however, the lower longitudinal beams 4 are provided on their outer lower edges with recesses 10, so that these beams have inverted L-profiles, so as to allow transport by portal lifting trucks engaging them there.

If desired the struts and beams may be at least partially open or closed profiles of non-rectangular cross-section. For example the corner struts 11 according to FIG. 11 consist of an open profile of angular cross-section; in FIG. 12 the corner strut 12 is a profile of circular cross-section; and in FIG. 13 the corner strut is a profile of semi-circular cross-section 13 with stiffening extensions 14, while in FIG. 14 the corner strut 15 is a profile of triangular cross-section. Likewise, intermediate struts may have profiles 16 of circular cross-section in accordance with FIGS. 17 and 18, or profiles of angular cross-section 17 in accordance with FIG. 19.

Outwardly cambered wall elements 18 are welded to the struts and beams of the frame, so as to increase considerably the section modulus thereof in both main directions of the wall and the stiffness of the assembly. The axes of curvature of the wall elements on the side and end walls are preferably positioned vertically and those of the wall elements of the ceiling of the container extend preferably in the longitudinal direction of the container. Each wall element is surrounded from all sides by frame elements (struts and beams), the axes of curvature of all the wall elements being positioned at right angles to the curved edges of the adjacent wall elements and to the adjoining faces of the frame profiles. Accordingly nowhere will elements cambered in different directions meet
one another, a frame element being always arranged between any such wall elements.

By the connections of the upper and lower longitudinal beams and vertical intermediate struts with the outwardly cambered wall elements the side walls of the transcontainer box utilize the properties of rigid girders and reliably prevent any undesirable bending thereof even under full load. Major wall elements 18 are reinforced by additional stiffeners. The latter consist in the preferred embodiment of U-profile sections 19 welded on from outside. Instead, they may consist in accordance with FIGS. 15 and 16 of arcuate portions of sheet metal, the radius of curvature formed integral with the wall elements, and with other elements in accordance with FIG. 15 of arcas 20 having their axes of curvature outside the container or in accordance with FIG. 16 of arcs 21 the axes of curvature of which lie inside the container. Alternatively profiles of circular or angular cross-section similar to FIGS. 18 and 19 or of any other cross-section may be welded as stiffeners to the wall elements. In a similar way additional stiffening of the corner struts may be effected by integral angular or arcuate flanges 22, as shown in FIG. 11. The adjoining flanges are in this case welded to each other at 23.

The wall elements are in general butt-welded to the frame elements. The wall elements can then be prefabricated and mounted individually or in sectional construction. Alternatively a whole wall may consist of continuous sheet metal panels 13 cambered outwardly in sections, to each of which supporting stiffeners are welded from outside. This manner of construction has the advantage of simplified protection from corrosion.

The wall elements 18 may be joined seamlessly also on the edges of the container as shown in FIG. 13 at 23. Moreover, it is possible in accordance with FIG. 14 to attach the wall elements to an oblique facet 24 of a profiled corner strut 15 of triangular cross-section.

The ceiling of the transcontainer consists in the embodiment illustrated in FIGS. 1 and 2 of three identical wall elements 18, cambered about the longitudinal directions and reinforced by two stiffeners 25. By this shape a volume reserve is afforded for thermal expansion during the transport of a full container. The intermediate beams 8 are provided with cut-outs 26 for equalization of pressure.

The bottom of the container consists in the embodiment of FIG. 2 of two cambered wall elements 27 descending in two steps towards the sole level and resting on two longitudinal bottom stiffeners 28. These bottom stiffeners 28 likewise consist in the present embodiment of U-profile sections welded to the wall elements from outside. These bottom stiffeners may, if desired, be used for heating the contents of the container (like the other stiffeners and hollow profiles of the frame). The transverse intermediate beams 7 of the frame are cut out at 29 at sole level for allowing complete discharge of any remnants.

Depending on the load to be taken, the directions and shapes of camber and the number of the cambered wall elements as well as of the stiffeners on the ceiling and bottom may vary. For example in the modified embodiment of FIG. 3 the bottom and ceiling of the container consist in simply cambered wall elements 27a and 18a, respectively. In the case of single curvature cambers the longitudinal wall stiffeners may be dispensed with. If necessary, the cambered wall elements of the bottom may be reinforced by welding on one or several tension straps 52 to the circumference of the camber.

For liquid containers which are not subdivided into compartments the axes of curvature of the bottom elements have to lie parallel to the longitudinal axis of the container for the purpose of allowing discharging without remnants. For liquid containers subdivided by partition walls 30 in the regions of the intermediate beams 7, 8 and intermediate struts 9 into individual compartments (FIG. 4), and for single-compartment containers for flowable solid bulk goods, which are to be discharged by tipping the containers, it is, however, convenient to arrange the axes of curvature of the bottom wall elements transversely of the longitudinal axis of the container.

Moreover transverse ribs may be provided on the bottom for engagement by fork-lift trucks.

Since the ceiling has to be designed for the same pressure loads as the bottom these possible constructions may likewise be applied to the ceiling of the container.

In the bays formed by intermediate beams and intermediate struts, the mounting of additional flat or cambered partition walls 30 (FIG. 4) or of standing or suspended baffles (FIG. 5) is possible without difficulty. Such suspended baffle elements are particularly advantageous for reducing the so-called free surface area of liquid contents of the container, which determines the inertia forces occurring when braking and accelerating and particularly upon ship movements. Besides, the intermediate beams have already a surge damping effect.

All internal edges and weld seams are rounded and ground in such a way that good and easy cleaning and, if desired internal coating are made possible.

As the material for the wall elements, primarily stainless steel or zirconium-nickel steel alloys are used because of their corrosion resistance. The frame elements may be made of less expensive carbon steel provided they are not in contact with the goods of the charge. In order to protect the front faces of the frame elements facing towards the interior of the container from corrosion these portions may be made of stainless steel, for example in FIG. 8 the corner support 1 is composed of an outer angular profile 31 of stainless steel and an inner angular profile 32 of stainless steel which are welded to each other at their corners. The wall elements 18, likewise consisting of stainless steel, are then welded to the inner angular profile 32.

Alternatively the corresponding portions of frame elements consisting of carbon steel may be covered with stainless steel sheet. For example in FIG. 9 the corner strut 1 consists of a hollow profile of rectangular cross-section of carbon steel, and the stainless steel wall elements 18 abut flanges 33 likewise consisting of stainless steel, which extend to the inner corner of the corner strut 1 and are welded to each other there.

The openings required for entering and cleaning the interior and the fittings for discharging, filling, warming or cooling or for measuring are arranged, for optimum utilization of space and for protection from being damaged, on reentrant portions of the wall facing or in the corners of the transcontainer.

Preferably a recess 34 of a semi-cylindrical or cambered shape corresponding to the internal pressure is provided on an end wall of the container for accommodating a fitting for the filling and discharging of the container, which fitting comprises a filling and discharging socket 35 on the lower part of the end wall, to which socket a cock 36 with hose coupling 37 is screwed. The hose coupling 37 is accessible through a corresponding opening 38 in the lower transverse beam 2 of the container. This sunken arrangement of the filling and discharging fittings has the further advantage that the recess 34 can be easily sealed by custom-made plugs.

The lid of the manhole is likewise so constructed that it occupies as little space as possible and can be sealed in a simple way by custom-made plugs. For this purpose the lid 39 is cambered inwardly and is provided with suitable sockets 40, 41 for airing and venting and for safety valves 42. The lid rests, with a seal 43 interposed, on the upper edge of a short manhole socket 44, which has to be made only high enough to afford space to the attachment means 45, 46. The ceiling 47 is somewhat recessed in the surroundings of the manhole, as shown in FIG. 5, so that the upper edge of the lid of the manhole does not lie at a higher level than the beams 3 and 8 of the frame. The lid and the fittings mounted in the hollow thereof are closed by a flat plate 48 secured against being tampered with. In the hollow of the lid there could collect any liquid leaked from the valves.

When the transcontainer is to be used for flowable solid bulk goods, a larger outlet port 49 (FIG. 10) is to be provided in the recess 34, and the transcontainer may be emptied preferably by tipping. In order to avoid dead corners forming on both sides of the discharge port, in this case oblique guide plates 50 are fitted on both sides of the outlet port and if desired in the region of the lower transverse beams.
What we claim is:
1. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame having profiled frame members, said frame comprising vertical struts and horizontal beams subdividing the wall faces of the transcontainer into individual bays, each bay containing one part-cylindrical outwardly cambered wall panel connected to said frame members so as to form unitarily therewith a liquid-tight tank resistant to bending, twisting and buckling, openings for access to the interior of said tank located within the frame contour, and wherein several adjacent wall panels consist of a continuous steel sheet strip outwardly cambered section-wise and attached to said struts from the inside.
2. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame having profiled frame members, said frame comprising vertical struts and horizontal beams subdividing the wall faces of the transcontainer into individual bays, each bay containing one part-cylindrical outwardly cambered wall panel connected to said frame members so as to form unitarily therewith a liquid-tight tank resistant to bending, twisting and buckling, openings for access to the interior of said tank located within the frame contour, and wherein several adjacent wall panels consist of a continuous steel sheet strip outwardly cambered section-wise and attached to said struts from the inside.
3. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame having profiled frame members, part-cylindrical outwardly cambered wall panels connected to said frame members so as to form unitarily therewith a liquid-tight tank resistant to bending, twisting and buckling, openings for access to the interior of said tank located within the frame contour, and wherein the cambered wall panels at the bottom of said tank are reinforced by curved tension straps.
4. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame consisting of frame members, part-cylindrical outwardly cambered panels connected to the frame members to form unitarily therewith a tank for the flowable goods in the form of a rectangular box girder resistant to bending, twisting and buckling, openings for access to the interior of said tank, and covers for the openings located within the frame contours, wherein some said cambered wall panels have margin portions with smaller radii of curvature than those of their camber and extending into the interior of said transcontainer.
5. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame having profiled frame members, said frame comprising vertical struts and horizontal beams subdividing the wall faces of the transcontainer into individual bays, each bay containing one part-cylindrical outwardly cambered wall panel connected to said frame members so as to form unitarily therewith a liquid-tight tank resistant to bending, twisting and buckling, openings for access to the interior of said tank located within the frame contour, and wherein the cambered wall panels at the bottom of said tank are reinforced by curved tension straps.
6. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame consisting of frame members, part-cylindrical outwardly cambered wall panels connected to the frame members to form unitarily therewith a tank for the flowable goods in the form of a rectangular box girder resistant to bending, twisting and buckling, openings for access to the interior of said tank, and covers for the openings located within the frame contours, wherein the cambered wall panels at the bottom of said tank are reinforced by curved tension straps.
7. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame having profiled frame members, said frame comprising vertical struts and horizontal beams subdividing the wall faces of the transcontainer into individual bays, each bay containing one part-cylindrical outwardly cambered wall panel connected to said frame members so as to form unitarily therewith a liquid-tight tank resistant to bending, twisting and buckling, openings for access to the interior of said tank located within the frame contour, and wherein the cambered wall panels at the bottom of said tank are reinforced by curved tension straps.
8. A transcontainer as claimed in claim 7, wherein the lower horizontal beams are provided with longitudinal recesses on their lower outer edges.
9. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame consisting of frame members, part-cylindrical outwardly cambered panels connected to the frame members to form unitarily therewith a tank for the flowable goods in the form of a rectangular box girder resistant to bending, twisting and buckling, openings for access to the interior of said tank, and covers for the openings located within the frame contours, wherein the cambered wall panels at the bottom of the tank comprise a cambered wall panel presenting a concave surface to the interior of the transcontainer and a convex surface to the exterior thereof, said wall panels being connected to the frame members and the vertical struts to form unitarily therewith a liquid-tight tank resistant to bending, twisting and buckling,至少 one selectively closable opening for access to the interior of said tank, and the outermost extent of the wall panels and the at least one opening being all within the contour defined by the rectangular outer frame.
10. A transcontainer as claimed in claim 9, wherein said frame has transverse intermediate beams provided with holes near the bottom of said tank to allow for complete discharge.
11. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame consisting of frame members, part-cylindrical outwardly cambered panels connected to the frame members to form unitarily therewith a tank for the flowable goods in the form of a rectangular box girder resistant to bending, twisting and buckling, openings for access to the interior of said tank, and covers for the openings located within the frame contours, comprising a manhole socket on top of said transcontainer, an inwardly cambered lid mounted tightly on said socket, and a pressure relief valve and safety valve member mounted in the hollow of said lid.
12. A transcontainer as claimed in claim 11, comprising a flat closable cover for said lid.
13. A rectangular transcontainer for flowable goods provided with corner fittings for stacking and lifting, comprising a rectangular outer frame having profiled frame members, two end walls, two side walls, a top wall, a bottom wall, vertical struts connected to said outer frame and spaced to sub-divide the side walls into individual bays, each bay containing a part-cylindrical outwardly cambered wall panel, each of said wall panels presenting a concave surface to the interior of the transcontainer and a convex surface to the exterior thereof, said wall panels being connected to the frame members and the vertical struts to form unitarily therewith a liquid-tight tank resistant to bending, twisting and buckling, at least one selectively closable opening for access to the interior of said tank, and the outermost extent of the wall panels and the at least one opening being all within the contour defined by the rectangular outer frame.
14. A transcontainer as claimed in claim 13, wherein the frame has corner struts which are of circular cross-section.
15. A transcontainer as claimed in claim 13, wherein the frame has corner struts which are of semicircular cross-section.
16. A transcontainer as claimed in claim 13, wherein the frame has corner struts which are of triangular cross-section.
17. A transcontainer as claimed in claim 13, wherein transverse external ribs are provided at the wall panels at the bottom of said tank for engagement by a fork-lift truck.
18. A transcontainer as claimed in claim 13, comprising surge baffles arranged in the interior of said container.

19. A transcontainer as claimed in claim 13, wherein said panels consist of a corrosion-resistant metal of the group consisting of stainless steel and aluminum alloys.

20. A transcontainer as claimed in claim 13, wherein said frame members, at least on their portions exposed to the interior of said tank, consist of stainless steel.

21. A transcontainer as claimed in claim 13, wherein said frame members, at least on their portions exposed to the interior of said tank, are covered with stainless steel.

22. A transcontainer as claimed in claim 13, comprising stiffeners reinforcing major bays of the wall panels.

23. A transcontainer as claimed in claim 22, wherein said stiffeners are attached to said panels from outside.

24. A transcontainer as claimed in claim 13, wherein the end walls each comprise a plurality of part-cylindrical outwardly cambered wall panels, said wall panels being contained in individual bays formed in part by vertical struts connected to the outer frame.

25. A transcontainer as claimed in claim 24, wherein one of the end wall panels has at its bottom a recess and comprising a filling and discharging socket for said transcontainer arranged in said recess.

26. A transcontainer as claimed in claim 24, wherein the top and bottom walls each comprise a plurality of part-cylindrical outwardly cambered wall panels, said wall panels being contained in individual bays formed in part by horizontal beams connected to the outer frame, and wherein said wall panels are also connected to said horizontal beams.

27. A transcontainer as claimed in claim 26, comprising partition walls arranged between intermediate beams and intermediate struts.

28. A transcontainer as claimed in claim 13, wherein the top and bottom walls each comprise a plurality of part-cylindrical outwardly cambered wall panels, said wall panels being contained in individual bays formed in part by horizontal beams connected to the outer frame, and wherein said wall panels are also connected to said horizontal beams.

29. A transcontainer as claimed in claim 28, wherein said horizontal beams extend at right angles to the axes of curvature of the associated wall panels.

30. A transcontainer as claimed in claim 28, wherein the bottom of said tank consists of panels cambered about the longitudinal direction of the tank.

31. A transcontainer as claimed in claim 30, wherein said frame has transverse intermediate beams provided with holes near the bottom of said tank to allow for complete discharge.

32. A transcontainer as claimed in claim 28, wherein the top wall of said tank comprises panels cambered outwardly about the longitudinal direction of the tank.

33. A transcontainer as claimed in claim 32, wherein upper transverse intermediate beams are disposed perpendicularly to said horizontal beams, said intermediate beams being connected to said wall panels and said outer frame, and wherein holes are provided in said intermediate beams.

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