This invention relates to the transportation of liquids, particularly in large quantities, and includes not only the containers therefor and the necessary attachments, but also the method of filling and emptying such containers. While some features of this invention may be adapted for general use, such as the shipment of wines, tomato juice, or other similar liquids or semi-liquids, it is particularly directed to the transportation of charged or carbonated liquids, and especially beer.

The difficulties incident to the transportation and handling of beer are well recognized. If the beer is placed in barrels or kegs for shipment, it involves considerable expense incident to the cost of the barrels and the necessity of cleaning and preparing the same for repeated shipments, and freight on the barrels during shipment and return. If the beer is bottled at the brewery, it is usually necessary to pasteurize the same and the cost of shipment in bottles with liability of breakage is also excessive.

In accordance with the present invention I provide for the transportation of liquids, such as beer or the like, in tank cars whereby large quantities may be shipped at comparatively low cost from the place of production to the places of distribution.

Among the objects of this invention are to provide novel means for transporting liquids of the character indicated to provide a tank car having a tank or receptacle which is adapted to receive such liquids and to keep the same in proper condition for a predetermined length of time; to provide a tank for a railway car which is constructed so that the inner surface will be comparatively smooth and free of any obstructions upon which bacteria might collect; to provide a tank car having a tank with suitable lining or coating for carrying beer or the like; to provide a tank car with novel means for filling and emptying the same and for maintaining a predetermined pressure therein; to provide a tank car of such conformation, as by having the center larger than the ends, so that it may be filled without the entrapment of any air therein even if the car is not standing in a level position; to provide a tank car for liquids, having a minimum number of fillings to minimize the chance of contamination and also the chance of leakage, particularly when the container is maintained under pressure or vacuum; to provide a tank car which can be easily sterilized and maintained in sterile condition during loading and unloading and also during transportation; to provide means for loading carbonated or effervescent liquids such as beer, pop, or the like, without undue foaming thereof; to provide simple means for determining the level of the liquid in the tank or container; to provide a pressure or vacuum relief safety valve or means which will normally seal the container but which will yield under excessive pressure or vacuum and admit sterilized air in the case of excessive vacuum or discharge gas or liquid to the atmosphere in the case of excessive pressure and will maintain the contents of the container in sterile condition; to provide means for sealing the container, particularly when shipping or transporting liquid or alcoholic beverages; to provide means for loading and unloading carbonated liquids such as beer, and maintaining a carbonation thereof during such operation and also during transportation; to provide a level gauge mechanism which may be removed after the tank or container is filled; to provide an improved coating or lining for the interior of a tank car or the like which will have no effect on the taste of the contents and which will protect the metal of the container against action which might be caused by the contents; to provide generally for a tank car or container adapted to be mounted on a car which will serve for the transportation of beer or the like, and will tend to cut the cost of transportation thereof; to provide a tank car which is suitably insulated to maintain the contents for a predetermined length of time at approximately the same temperature as when loaded; and more particularly to provide an improved method for filling and emptying a tank car with charged or carbonated liquids or liquids under pressure, or at less than atmospheric pressure as in vacuum.

In the accompanying drawings illustrating this invention,

Figure 1 is a side view of my improved tank car with parts shown in section and other parts shown diagrammatically for convenience in illustration;

Figure 2 is an enlarged cross sectional view of a portion of the tank showing the dome with loading and unloading apparatus and other equipment associated therewith;

Figure 3 is a diagrammatic view illustrating the arrangement for supplying gas to the container and removing the same therefrom;

Figure 4 is a sectional view illustrating a bottom loading and unloading attachment including a closing valve; and

Figure 5 is a sectional view showing a special form of valve to prevent foaming when the tank is being filled.

As shown in these drawings 10 illustrates a tank car having any ordinary or preferred form of running gear and frame and including my improved tank or container 11 which may be mounted on the car and attached thereto in any conventional manner. The tank or container 11 is preferably formed of sheet metal such as sheet steel and may conveniently be formed in sections such as...
section 12, and section 13 and heads 14, these sections being welded together as indicated by the joints 15 and the inner surfaces ground smooth so that there will be practically no crevices or projections or obstructions upon which bacteria might collect, this being true of the entire inner surface of the complete tank or container. The tank is preferably made smaller at the ends than at the center, or tapering or converging from the center toward the ends as clearly shown in Fig. 1, so that there will be little or no possibility of air being trapped in the container when it is being filled as might occur if the car were standing on a grade. It will be understood that such taper may be made in accordance with the standard grades of any railroad upon which the car is to be used so that the pitch due to the car standing on the grade as when being filled, will be less than the pitch provided by the taper at the top of the tank. This is particularly necessary to prevent contamination of the contents by any air which might otherwise remain in the tank. The tank or container 11 has a sump or recess 16 at the bottom into which the contents will drain in order to effectively empty the tank even if it is standing out of level during the unloading operation, the taper or slope of the bottom of the tank serving to direct the contents to such recess. An outlet opening or threaded bung hole 17 is provided at the bottom of the recess, this opening having a closing plug 18 preferably made of aluminum, stainless steel, or other material which will not contaminate the contents of the tank. This plug is preferably inserted from the inside of the tank, thus preventing any possibility of unauthorized removal of the same and the arrangement provides an efficient drain to drain the tank when being washed or cleaned.

The tank is provided with a dome 19 which is preferably formed of a single piece of metal, or of parts welded together to provide a smooth inner surface conforming to the inner surface of the tank. This dome has a flange 20 which fits closely against the surface of the tank and which is welded thereto. The shell of the tank extends for some distance inwardly beyond the dome flange and has a hole or passageway 24 to provide communication between the tank and the dome, this hole being preferably very large to permit a man to pass therethrough.

In the construction of an all-welded tank or container of large size, such as contemplated herein, it is necessary or desirable to anneal the entire structure after the parts have been welded together. Of course with a large container such as the present tank, large furnaces must be provided for heating the same for annealing and during the annealing operations or baking the lining therein, more or less strains are set up in the container and attached parts, such as the dome, which necessitates the effective attachment of the dome to the shell, as above described, to prevent cracks in the parts or the separating of the dome from the shell. It will also be understood that the construction of the tank is such that it may be inspected as by means of X-rays and tested in the various ways necessary to be acceptable under government, railway or other regulations.

The dome 19 has an upwardly projecting neck 25 with an outwardly extending flange 26 for receiving a cover 27 which has a centrally depressed portion 28 and an outwardly extending flange portion 29 which rests on the flange 26. The cover is held in any suitable manner as by means of eye bolts 30 which are pivoted at 31 to lugs on the dome and which engage with slots in the flanges with their nuts 32 pressing on the top of the cover as shown. A gasket may be interposed in the usual manner between the flanges to make a tight closure. This provides a convenient means for securing the cover and prevents the loss of the bolts.

The entire tank and dome, with the exception of the necessary inlets and outlets are covered with insulating material 33 of any suitable kind which is protected and held in position by a sheet metal casing or jacket 34. I also provide an insulating cap or cover 35 for enclosing the dome cover and another similar insulating cap or cover 36 for covering an inlet and outlet opening. In some cases the covers 35 and 36 may be formed integrally or as one cover if desired. These covers are secured to the insulating jacket over the dome in any suitable manner as by means of the fastenings 37 and are preferably formed so that they may be sealed while in transportation to conform with the requirements of the law for shipping alcoholics liquids or the like. Such sealing means is also beneficial in shipping other products and preventing unauthorized tampering therewith, particularly in such cases as where it is a penal offense to seal seals on railroad cars without proper authority.

The dome 19 has an upwardly projecting neck 38 with a flange 39 at the top. A loading and unloading or siphon pipe 40 extends downwardly through the neck and through a hole 41 in the top of the tank shell and terminates at a short distance above the bottom of the sump or recess 16 as shown particularly in Fig. 1. The lower end of this pipe is braced or fastened by a suitable clamp or support 42 which is welded to the tank. This pipe is preferably made of aluminum but may be made of other suitable material, depending upon the contents of the container or liquids to be shipped therein. The upper end of the pipe 40 is connected with a valve 43 which has a flange 44 that rests on the flange 39 and is held by means of bolts 45. A gasket 46 is preferably inserted between the flanges to make a tight closure. The valve 43 may be of any of the well known types, such as a globe or gate valve, but is preferably of the type shown in Fig. 2. This valve and the pipe 40 may be subjected thereto and be readily removed for cleaning or sterilizing the pipe 40 or 50 for other purposes. One branch 41 of the valve body is threaded to receive a corresponding threaded portion of a sight glass 48. The opposite end of this glass or member is provided with a threaded end or fitting 49 for connection with a hose or pipe 50 required for the delivery or removal of the contents of the tank.

When the car is being prepared for transit the sight glass or inspection member 48 is removed and the threaded portion 47 of the valve is covered and protected by a cap 51 which is attached by means of a chain 52 to the body of the valve or fitting 43. A similar cap or cover 53 is provided for covering the valve stem 54, the adjacent portion of the valve body being threaded 55 for receiving the same. The caps 51 and 53 may be provided with holes 55 for receiving a sealing wire or the like so that they may be sealed to prevent unauthorized opening during transit.

Suitable means are provided for introducing gas 70 into the tank through a fitting the discharge of the same as required. In the particular arrangement shown, a valve 56 has a body with a threaded stem 57 which engages with a suitable threaded opening in the cover 27 as shown particularly in...
Figure 2. The upper end of the valve body is enlarged and threaded at 58 for engagement with a coupling member 59 on the lower end of a pipe 66, this coupling being of any common type and preferably provided with a gasket to insure tight closure. When the car is prepared for shipment, this coupling and parts connected therewith are removed and the threaded end 58 is covered by a cap 61 which is attached to the cover by a chain or flexible connection 62. The valve stem 63 is also covered by a cap 64 which is attached to the cover by a flexible connection 65, these parts also being preferably perforated for receiving a sealing wire of the character and for the purposes above described in connection with the valve 43.

The pipe 66 is connected with one branch of a T or preferably arranged for ready removal from the container. These gauges are preferably mounted in the cover 27. A bushing or fitting 75 extends through a hole 76 in the cover and makes a tight connection therewith. The hole 76 is adapted for inserting the passage way therethrough. A pipe or hose 70 is connected with the inlet of the pressure relief valve 68. This pipe may be connected at its other end to a gas collecting tank 71, such as commonly found in breweries, for collecting gas, or it may be connected with the gas inlet of another tank the same as described herein. Or if desired, it might also be opened to the atmosphere. A hose or pipe 72 leads from the other branch of the T 66 to any suitable source of supply of gas so as to supply gas to the tank, which may also be a collector tank such as the tank 71. The pipe 72 is also provided with a valve 74 for controlling the passageway therethrough.

The tank is provided with a pressure or air gauge and a liquid level gauge which is intended to be the top level to which the tank is to be filled and which level is preferably at a substantial distance above the bearing 79. A three-way cock or valve 85 is mounted above the valve 86, and serves to measure the pressure within the tank. When the valve is turned in one direction communication is had between the tank and the gauge and when turned in another direction communication is made between the tank and the outlet orifice to the atmosphere. The third position of the valve closes the passageway through the bearing 79.

When these gauges are removed as for shipping, the nut 64 is unscrewed from the fitting, which releases the tube 82 and parts connected therewith and as the tube is withdrawn the hole through the collapsible member 71 closes. In order to provide a further closure and to protect the parts a cap 89 is provided which is screwed onto the fitting 79 to close the passageway therethrough. This cap is preferably attached to the cover by means of a chain 90 and is also preferably provided with holes 91, as with the previously described caps, for receiving sealing tires.

The tank is also preferably provided with an overload or safety device which will yield under excessive pressures in the tank or when the pressure is reduced below a predetermined amount. This relief device is preferably arranged on the dome 18 as shown particularly in Figure 2. The dome has an upwardly extending neck or cylindrical projection 92 which may be formed integrally therewith or formed separately and welded thereon. A cylindrical or cup-shaped member 93 is mounted in the projection 92 and has an upper flange 94 which engages with a flange 95 on the neck. These parts are held together in any suitable manner as by means of bolts 96 and a gasket or packing 97 is inserted therebetween to make a tight closure. The cup 93 may be a collector tank such as the tank.

When the tank is used for shipment of products to be carried under vacuum conditions, or at less than atmospheric pressure, the cup or cylinder 93 is provided with a gasket 101, and a plurality of screens 102 are preferably extending across the cup. These screens may be made of any suitable material such as bronze, copper or the like, and when the safety device operates as by breaking of the seal or disc 100 due to excessive pressure in the tank, serve to provide fish separators and prevent undue foaming of the discharge.

When the tank is used for shipment of products to be carried under vacuum conditions, or at less than atmospheric pressure, the cup or cylinder 93 is provided with a gasket 101, and a plurality of screens 102 are preferably extending across the cup. These screens may be made of any suitable material such as bronze, copper or the like, and when the safety device operates as by breaking of the seal or disc 100 due to excessive pressure in the tank, serve to provide fish separators and prevent undue foaming of the discharge.

When the tank is used for shipment of products to be carried under vacuum conditions, or at less than atmospheric pressure, the cup or cylinder 93 is provided with a gasket 101, and a plurality of screens 102 are preferably extending across the cup. These screens may be made of any suitable material such as bronze, copper or the like, and when the safety device operates as by breaking of the seal or disc 100 due to excessive pressure in the tank, serve to provide fish separators and prevent undue foaming of the discharge.
provided with downwardly projecting lugs which are secured to the neck or projection in any suitable manner as by means of cap screws whereby the shield may be readily removed.

If desired the loading and unloading pipe and all parts connected therewith and provision for mounting the same in the tank may be omitted and a bottom filling connection provided such as shown in Figure 4. In this case the outlet opening and plug 18 could also be omitted from the bottom of the tank. In the arrangement shown in Figure 4, a valve body is connected directly with the bottom of the sump or depression and depends downwardly therefrom. This body is provided with a flange which may be welded or otherwise secured in a tight manner to the bottom of the tank. The lower end of the valve body is preferably reduced and threaded as shown at 109 for connection with a hose or pipe for filling or emptying purposes. A cap 108 is used for closing the outlet during transit this cap being connected with the valve body by means of a chain. A groove such as a V-groove may be provided in the casting of the valve body below the valve mechanism in order to comply with the requirements of the Association of American Railroads which provide that a tank car for railroad service must have its weakest point beneath the valve mechanism.

The casing or body is formed to receive a valve seat made of suitable metal such as bronze or the like, which may be threaded into the valve body but which preferably has a pressed fit therein. The valve seat has an inclined or tapered surface which is engaged by the valve 115 which is correspondingly tapered to engage therewith. The valve has a downwardly projecting stem 116 and radially arranged guide members 117, the latter being formed to slide on the inner wall of the valve cage or seat 113. The valve cage has inwardly extending arms 118 at the bottom which support a bearing 119 for the valve rod 116. The valve stem extends downwardly below this bearing and carries a spring 120. The upper end of the spring abuts against the bearing 119 and the lower end engages with a washer 121 which may be adjusted by a nut 122 on the lower end of the stem. This arrangement is such that the spring tends to hold the valve 116 normally in closed position.

In order to open the valve when desired a cam shaft 123 is operatively mounted in the valve body or housing. One end of the shaft engages with a bearing 124 in the side of the valve body and the opposite end extends outwardly through a bushing which is secured to the side of the body by bolts 125. The bushing is threaded at 127 to receive a gland 128 which in turn forms thepacking 129 to make a tight closure. A cam 130 is formed on the shaft or attached thereto and is positioned below the valve stem 116 and is adapted to contact therewith to open the valve when the shaft is turned. The outer end of the shaft is preferably square for engagement by a key or wrench for turning the same. The bushing or fitting 125 is also threaded exteriorly at 132 to receive a cap 133 which makes a tight closure to prevent any possible leakage around the shaft. This cap is attached to the car by means of a chain 134 and may also be provided with holes for sealing wires as previously explained.

The valve casting or body may also be provided with a pet cock 135 in order to facilitate sterilization.

A modified form of valve is shown in Figure 6 which is intended to prevent foaming. This valve is intended to be used in a similar manner as the valve 115 but in this instance the valve proper 136 projects upwardly into the tank and its upper portion is of considerably larger diameter than the inlet opening. It is provided with an annular curved portion 137 extending upwardly and outwardly from the valve seat which provides a spreading surface to guide the flow of liquid entering through the valve when loading. The liquid will be directed at approximately right angles to the axis of the valve stem which reduces foaming when loading liquids which are liable to foam, because the incoming liquid is forced along the bottom of the container, having no tendency to rise. On the contrary when liquid is forced in an upward direction, particularly through the liquid in the tank, with sufficient force, it will foam upon reaching the surface.

The method of transporting carbonated liquids such as beer, including the use of the tank equipped as shown in Figure 1, is substantially as follows. The covers 35 and 36 are removed from the dome and the caps 51 and 52 are removed from the valve 43. A pipe line is then connected to the inlet of the valve and steam or any suitable sterilizing liquid or other sterilizing medium, is admitted to the tank at suitable temperature and for a sufficient time to thoroughly sterilize the same. As it is necessary to remove all of the air from the tank before loading the cover 27 and the fracturing disc 100 are removed and the tank or container is filled with water through the valve 43 until it floods over the highest point. On account of the tank being of smaller diameter at the ends or having its upper surface portion sloped toward the center, all of the air will be driven therefrom and entrapped at the air at the ends is avoided. While 1 have shown and described the tank proper as having smaller ends or sloping toward the center to avoid entrainment of the air it will be apparent that this result might be obtained by other means such as pipes (not shown) connected with the ends of the tank and with the dome, or a sloping channel (not shown) in the tank top connected with the dome could also be used to serve to overcome the entrainment of the air. The water used for filling the tank or container and driving out the air is usually chilled to pre-cool the car to the desired temperature, which in the case of beer is approximately 32° F. When the tank has thus been filled with water, the cover 27 and the fracturing disc 100 and parts connected therewith are replaced, and the water supply shut off. The hose or conduit from the water supply to the valve 43 is disconnected either from the valve or at its other end and a conduit or hose connected to the valve 43 to provide for the removal of the water in the tank. The cap 58 is removed and the pressure gauge and liquid applied to the bearing or fitting 79 as shown in Figure 2, and the cock 55 is turned to connect the pressure gauge with the tank or container. The conduit or pipe 72 from the CO2 gas supply is connected with the 7 88 and the 7 in turn connected with the valve 56 by means of the nut 58 to complete the connection from the pipe to the tank. The valve 60 is then closed and the
2,102,124 valve 4 opened and the CO2 gas allowed to flow from its source into the tank. The water in the tank of the desired pressure inside the tank which is usually fifteen pounds per square inch in the case of beer. When the desired pressure is obtained in the tank, the gas inlet valve 74 is closed and the valve 59 opened, allowing the gas to exert its pressure against the relief valve 68 which is preferably connected by means of the pipe 70 to a gas collecting tank. The valve 43 is closed and the water outlet hose is disconnected and beer or carbonated liquid hose or conduit is then connected with this valve. The valve 43 is then opened and the beer or liquid allowed to flow therethrough into the container. As the liquid is forced through the relief valve 68 and pipe 70 into the collecting tank such as the tank 71, it will be noted that the pressure inside the tank or container is maintained at the pressure at which the relief valve is set to control the same. By increasing the pressure for beer at approximately fifteen pounds per square inch, all foaming is prevented and there is no loss of carbonation. When the beer or carbonated liquid is flowing into the container, the cock 85 is turned to shut off pressure from the pressure gauge 87, and opened to allow gas from the container to flow through the outlet hole or orifice 87, it being understood that this hole is sufficiently small to prevent undue escape of gas. When the liquid reaches the bottom tube 82 it will be forced up through the tube and out through the hole 87 in the cock 85, thus indicating that the tank had been filled to the proper level. As previously explained, the lower end of the tube 82 is set at the height desired to carry the liquid in the container so that when liquid flows out through the hole 87 the valve 43 is closed and the liquid conduit disconnected therefrom and the cock 85 is also turned to closed position.

The lower end of the tube 82 is terminated so that the liquid fills the tank and also the lower side of the dome 19 far enough to substantially limit the surging in transit to the contents of the dome. The connection of the dome to the tank which provides a baffle plate between the dome and the body of the tank and the filling of the same in this manner to prevent surging and foaming forms an important feature of this invention.

After the tank has been filled the pressure and depth gauges are removed from the fitting 19 and in doing this the tube 82 should be pulled up rapidly so that when the lower end of the tube passes the lower end of the flexible cylinder portion 71 the sides of the cylinder are collapsed or pressed together by the pressure inside the tank and form a seal to prevent escape of the gas from the tank. After the gauges have been removed the cap 89 is screwed in position to seal the opening through the fitting 19. The caps 51 and 53 are applied to the valve 43 and caps 61 and 64 are applied to the valve 56.

By the use of such caps all of the openings are provided with double seals which is very desirable because any loss in pressure during transit might cause injury to the contents of the tank and serious loss to the shipper. The foam separator or sterilizing means 103 and 104 are then placed in position and the guard 105 attached. The covers 35 and 36 are then fastened in position and sealed and the car is ready for transit. It will also be understood that the various sealing caps which are provided with holes for sealing wires may be sealed in position to avoid tampering during transit.

When the car arrives at its destination it is unloaded as follows. The outlet connections are sterilized and gas supply connections attached as for loading, the valves 56 and 14 being opened and the valve 59 being closed. The covers 35 and 104 are removed and a hose or conduit connected to the valve 43 and leading to a racking machine or storage tanks or other point of discharge. The racker or storage tanks (not shown) are filled from any suitable source with CO2 gas at the desired pressure to prevent foaming and loss of carbonation. The valve 43 is then opened, also the gas supply valve, being careful that sufficient pressure is maintained in the tank or container to prevent loss of carbonation. The gas displaces or drives out the liquid in the container and opening the fact that the end of the discharge pipe 40 is close to the bottom of the recess 16, the entire contents are removed even though the tank may be slightly out of level. This also applies to the displacement of the water when loading. When the liquid has been displaced or driven out, the outlet conduit is removed from the valve 43 and the tank is thoroughly washed to remove gas so that men can enter the same if necessary.

It is evident that the loading and unloading mechanism could be removed before and after loading or unloading in a similar manner to that employed in removing the pressure gauge and height gauge fitting. This would minimize possible breakage of the pipe 40 and would lessen the chance of leaks and contamination.

When the tank or container is equipped with a bottom loading and unloading valve such as shown in Figures 4 and 5, the method of filling and emptying the tank would be substantially as above described and will be readily understood by those familiar with such operation. This arrangement would have the advantage of having fewer parts inside the tank which might cause contamination and would be preferable when used to transport certain types of liquids.

The insulating of the tank is a desirable feature which would result in additional saving to the user, the beer or liquid being loaded in a precooled container at 32° F, could easily be shipped across country or for long distances, even in summer, in a well insulated tank car such as described, without rising over the limiting temperature of 44° F. The large volume of liquid carried in the container is responsible to a great extent for this improvement. This arrangement would avoid all icing charges to the shippers and would also cut out the expensive repairs to the interiors of ordinary refrigerator cars caused through top icing of beer shipments.

The considerable saving in transit due to the use of my improved tank car is evident. One tank car of this type would transport approximately three times the liquid volume shipped in a standard refrigerator car. It also reduces the brewer's investment in cooperage and packages, especially when we consider the large part of his equipment which is out of service while in transit, as in the return of barrels to the brewery.

While the method of operation herein described relates particularly to the transportation of beer...
or similar carbonated beverages, it is evident that sterile air, or even atmospheric air, could be used in connection with some products that are not carbonated. It is also evident that CO₂ could be used whether the liquid is carbonated or not, because in liquids that are not carbonated, the fact that they come in contact with CO₂ would in many cases have no effect as it requires considerable agitation over a period of time for any liquid to absorb CO₂ gas. Other liquids could be loaded and unloaded by gravity, especially when using the bottom valves shown in Figures 4 and 5, a sterile air inlet being attached to the valve 5 if required. It is usual to insert a sight glass or glass gauge such as the glass 48 between the unloading valve mechanism and the hose or conduit.

It is also evident that in shipping some products, such as wort, it would be beneficial to use a non-insulated container, thereby lowering the temperature of the contents during transit and effecting considerable saving to the operators in refrigeration since it is necessary to reduce the temperature of wort to 36°F. for fermentation.

From this description it will be apparent to those familiar with the commercial transporting of liquids that my improved tank car and apparatus associated therewith and also my improved method conform to the requirements of the Bureau of Explosives, particularly in that 30% excess is allowed for expansion in a pressure vehicle of this nature. It also conforms to the requirements with regard to welding, annealing of the complete container and X-ray examination thereof. The rules of the Association of American Railroads are also complied with as my improved car was accepted thereby and receive classification for regular service. The container and method also conform to the requirements of the Bureau of Pure Foods and Drugs and the regulations of the Internal Revenue Department, with respect to alcoholic liquids whereby the same may be utilized for interstate shipments.

While I have demonstrated the practicability of shipment of large quantities of beer in my improved tank car such as shown and described herein, it is apparent that modifications may be made in the method of the construction of the apparatus in order to adapt the same for different materials to be shipped or for different conditions. It is thought that the numerous advantages of my invention will be understood from the foregoing description and it is obvious that numerous changes may be made in the form, construction, and arrangement of the parts without departing from the spirit or scope of my invention, and therefore I do not wish to be limited to such particular features except as specified in the following claims, in which I claim:

1. A beer transporting tank, means for rigidly securing the tank on a railroad car, said tank including a lining or inner surface of a material adapted to resist the reaction of the liquid contents, a dome at approximately the center of the tank and from which the body of the tank tapers in opposite directions to the ends thereof to prevent formation of air or gas pockets in the body thereof and to drain the contents to a central point in the bottom of the tank, the walls of the tank and dome being insulated to assist in maintaining the bulk of the liquid contents at a low temperature during transportation, a baffle plate at the bottom of the dome having a comparatively small central opening therein leading into the dome only; together with a filling and emptying valve pipe connecting with the tank at the lowest point of the bottom thereof, whereby the tank mounted rigidly on the railroad truck facilitates the shipping of beer and similar carbonated liquids to distant points.

2. A beer transporting tank, means for rigidly securing the tank on a railroad car, said tank including a lining or inner surface of a material adapted to resist the reaction of the liquid contents, a dome at approximately the center of the tank and from which the body of the tank tapers in opposite directions to the ends thereof to prevent formation of air or gas pockets at said ends and to drain the contents to a central point in the bottom of the tank, the walls of the tank and dome being insulated to assist in maintaining the bulk of the liquid contents at a low temperature during transportation, a baffle plate at the bottom of the dome having a comparatively small central opening therein leading into the dome only; together with a filling and emptying valve pipe connecting with the tank at the lowest point of the bottom thereof, whereby the tank mounted rigidly on the railroad truck facilitates the shipping of beer and similar carbonated liquids to distant points.

3. Apparatus for transporting beer comprising a metal tank of large capacity having a lining which is resistant to any chemical action of the beer and having a permanent heat insulating covering, said tank also being tapered from the center toward the ends and having a relatively small opening at the top with a dome of substantially larger diameter than said opening whereby the walls around the opening will act as a baffle between the dome and the interior of the tank, a filling and emptying pipe extending into the tank having an open end adjacent to the bottom of the tank at the lowest portion thereof, a gas inlet and outlet pipe having its open end adjacent to the top of the tank, valves for said pipes and means for rigidly securing the tank on a railroad car, with its longitudinal axis lengthwise of the car.

4. A metallic shipping tank of large capacity for shipping beer, for the purposes set forth, having a lining of suitable material to protect the liquid transported therein and having a permanent heat insulating covering which will serve to maintain the temperature of the liquid in the tank for a predetermined time and within predetermined limits; the tank being tapered from the center toward the ends to provide for escape of gas from the ends and to drain toward the center, a dome at the center communicating with the interior of the tank, a baffle plate between the tank and the dome having a small opening therein leading into the dome, a valve controlled filling and emptying pipe communicating with the central bottom portion of the tank, a valve controlled gas inlet and outlet communicating with the top central portion of the tank, a pressure relief valve to control the pressure while filling the tank, and means for rigidly securing the tank to a railroad car.