Oct. 19, 1926. 1,603,698

A. A. KRAMER

TANK

Filed March 9, 1925

Fig. 1.

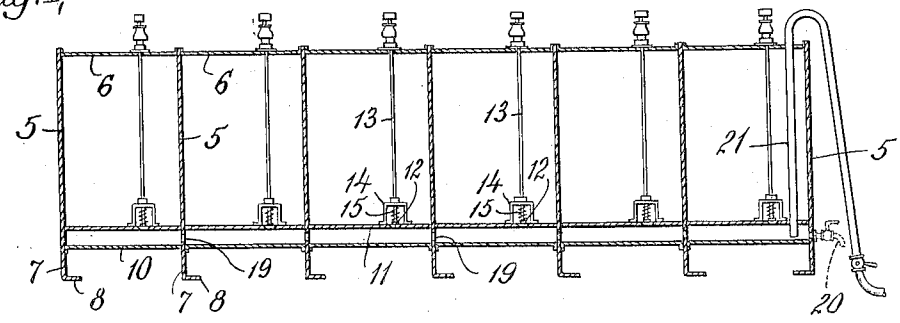



Fig. 2.

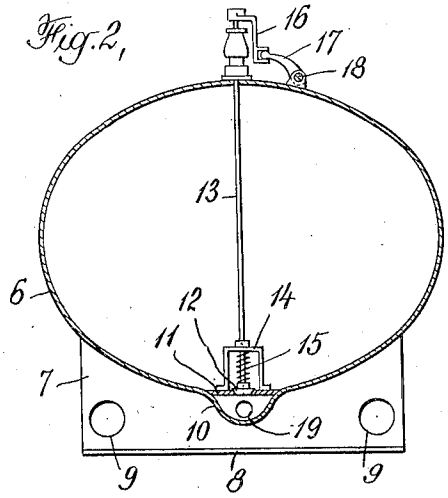



Fig. 4.

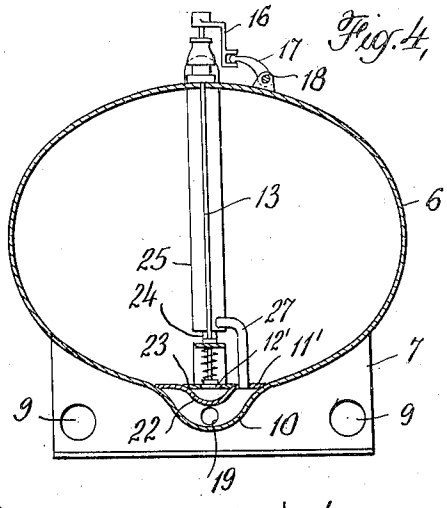
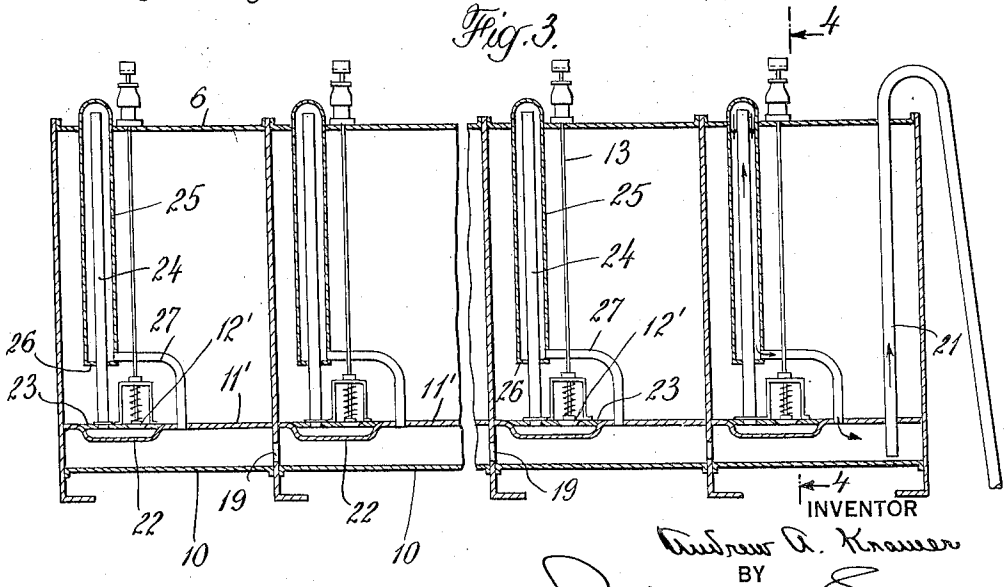



Fig. 3.




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Patented Oct. 19, 1926. 1,603,698

# UNITED STATES PATENT OFFICE.

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## TANK.

Application filed March 9, 1925. Serial No. 13,950.

This invention relates to tanks for use in distributing and dispensing volatile liquids, particularly gasoline, and is directed to the provision of a tank of an improved construction adapted to be mounted upon the chassis of an automobile for use in distributing gasoline to a multiplicity of service stations. More particularly the invention relates to a tank of the type in which the body is subdivided into a plurality of separate compartments such that the gasoline may be withdrawn from any selected one of the said compartments without affecting in any way the supply of the others. By so subdividing the entire amount of gasoline carried by the vehicle into a plurality of separate supplies in the several compartments, the element of danger incident to conveying such an inflammable fluid, more particularly in crowded city streets, is greatly reduced.

In accordance with the invention, the plates from which the tank is made are shaped to form a trough or elongated sump running the full length of the tank and under the entire line of tank compartments and means are provided whereby the contents of any compartment may be discharged into this trough through which they flow to suitable outlet devices.

In the preferred embodiment of the invention the plates which are employed for dividing the tank into the several separate compartments are extended below the body of the tank formed by what is known as a wrapper sheet and these extensions of the division plates are employed to support the tank as a whole and stiffen its structure. When this construction is employed in a tank having the lengthwise trough above referred to and valved outlets to the trough from all of the several compartments, the extensions of the division plates are provided with holes through which the liquid may flow from one section of the trough to another.

The trough referred to is preferably provided by pressing the wrapper sheet to the shape required for providing the trough, and then placing a plate over the top of the trough and welding its lateral edges to the metal of the wrapper sheet. This plate in effect constitutes the bottom of the tank compartment and as the wrapper sheet is maintained imperforate the danger of leakage is avoided. In each tank compartment, this cover plate of the trough is provided with an outlet opening controlled by a valve and the operating means for the several valves extends to the exterior of the tank at the top thereof whereby any selected valve may be opened and closed at will.

In a tank of this construction, the liquid allowed to flow into the trough from a selected compartment may be drawn off from the trough through a faucet of the type commonly employed in such tanks located at the rear end of the tank in a compartment provided for the dispensing devices. Such a construction, however, involves the provision of an outlet opening below the level of the liquid in the tank and that is considered objectionable. Instead, therefore, a siphon may be provided for drawing off the liquid from the trough by the use of a siphon, the bend of which is located above the liquid level. Such a siphon may be located outside the tank, preferably immediately adjacent to its rear end wall, or, if desired, it may extend from the trough up through the rearmost compartment of the tank and through the top wall of the tank and then bend down along the rear wall. For the operation of such a siphon, a manually operated pump may be provided on the vehicle for starting the flow from a compartment out through the siphon, the flow being continued through a by-pass around the pump. Such a construction is illustrated and described in an application filed by me January 21, 1925, and serially numbered 3776. Such a construction as that above outlined involves a possibility of inaccurate supply of liquid if the tank compartments are relied on as measures and if leakage occurs at the valves of one or more of the compartments. This may be guarded against quite effectually by providing a siphon for each compartment for effecting the flow of the liquid from that compartment into the trough. With such an arrangement the liquid could be withdrawn from the trough by a faucet at the rear end thereof or by a siphon additional to the several individual compartment siphons arranged as above set forth.

These and other features of the invention will be better understood by reference to the following description taken in connection with the accompanying drawing, in which Fig. 1 is an elevation of a tank embodying the invention adapted to be mounted on the frame of a vehicle; Fig. 2 is a transverse section of the tank shown in Fig.

1; Fig. 3 is a view similar to Fig. 1 showing a modified construction; and Fig. 4 is a transverse view in section on line 4—4 of Fig. 3.

Referring first to Figs. 1 and 2, the tank is shown as consisting of six compartments formed by vertically disposed plates 5 and wrapper sheets 6. The wrapper sheets are bent to an oval or similar shape indicated in Fig. 2, their lateral edges coming together at the top and the sheets being unpierced at any point below the liquid level line. Each of the plates 5 is extended below the wrapper sheet to form an extension 7 preferably flanged as shown at 8 and these several extensions 7 are employed for supporting the tank structure and for stiffening its construction. In Fig. 2 openings 9 are shown in the extensions 7 to receive pipes to which the extensions are welded for the purpose of strengthening the construction and making it much more rigid.

The wrapper sheet 6 of each compartment is shaped at the bottom thereof as shown at 10 to form a trough extending in a direction parallel to the axis of the tank, the bottom wall of this trough being therefore integral with the side walls of the compartment itself.

A plate 11 is then mounted in position to form the bottom wall of the tank compartment and the top wall of the trough 10. This plate 11 may be of rectangular shape and of the width of the top portion of the trough and its lateral edges are welded to the wrapper sheet. In each plate 11 is an opening controlled by a valve 12 mounted on the end of a rod 13 which extends entirely across the tank compartment and out through the top thereof. A frame 14 secured to the plate 11 serves as a guide for the stem 13 and a spring 15 coiled about the stem urges the valve 12 to its closed position. At its upper end the stem 13 passes through a suitable stuffing box and an arm 16 mounted on it is adapted to be engaged by a lever 17 on a rock shaft 18 to lift the stem and thereby open the valve. Each of the several compartments of the tank is built up in a similar manner and each is provided with a valve; and the valve operating mechanism including shaft 18 and arms 17 is so constructed as to permit of selecting any of the several valves and opening it so as to discharge liquid from the compartment controlled by that valve.

The extension 7 of the partition plate 5 is provided with holes as indicated at 19 which connect the sections of the trough so that a continuous trough is formed running the entire length of the tank along the bottom thereof parallel to the axis and into which the liquid may be allowed to flow from any selected compartment by manipulation of the valve of that compartment.

Suitable means are provided for regulating the flow of the liquid out from the trough. In Fig. 1 I have shown a faucet 20 of the type commonly employed on tanks for dispensing gasoline mounted in an opening in the rear wall 5 of the tank structure in communication with the end of the trough. Provision for withdrawing the liquid in this way is considered objectionable because it involves the use of an opening located below the level of the liquid in the tank compartments. To obviate this objection a siphon may be provided as shown at 21 connected at one end to the trough and extending up to a point above the liquid level and then down to suitable dispensing devices. In Fig. 1 the upwardly extending leg of the siphon is shown as located within the rear compartment of the tank, though if desired it may be outside the tank, preferably adjacent to the rear end wall 5. A hand operated pump may be provided on the vehicle for starting the flow from the trough up over the bend of the siphon and if desired a valve-controlled port may be provided at the top of the siphon for discontinuing the siphon action, all as described in my application above referred to.

The construction above described may be further developed to guard against the effect of leakage of one or more of the valves controlling the outlets from the compartments, as is shown in Figs. 3 and 4. In accordance with these figures a siphon is provided for each tank compartment for regulating the flow from that compartment into the trough. For this purpose the plate 11′ forming the bottom wall of the tank compartment and the top wall of the trough is pressed to form a sump 22 which has a plate 23 welded in position over it. The valve 12′ controls an opening in this plate 23 and therefore controls the flow of the liquid from the tank compartment into the sump 22. The liquid is withdrawn from this sump by a siphon. In Fig. 3 a pipe 24 is shown as having its end secured in another opening in the plate 23 so as to be in communication with the sump 22 and this pipe extends up through the compartment to a point above the top thereof. A second pipe 25 with a closed end fits over the upper portion of the pipe 24 as shown and its lower end is closed by an annulus 26. A pipe 27 connects the lower portion of the pipe 25 with the trough formed by the wrapper sheet 10 and the plate 11′.

Each of the several compartments of the tank is provided with a siphon structure similar to that above described for controlling the flow from the tank compartment into the trough and the several trough sections are connected by openings 19 as shown. The liquid may be withdrawn from the trough by a siphon 21 which may have one

leg located within the end compartment of the tank or may be located entirely outside the tank and preferably against the rear end wall.

In the operation of a tank of this construction the valve 12' of a selected compartment is opened and suction is applied to the outlet end of the siphon 21 in any suitable manner, as for instance by the hand-operated pump above referred to. This suction is exerted through the trough and the pipes 27, 25 and 24 upon the liquid which has flowed by gravity into the sump 22 of the tank compartment whose valve 12' has been opened. In response to this suction the liquid flows from the sump 22 up through the pipe 24 and then down through the pipes 25 and 27 and into the trough and from the trough it passes through the siphon 21 to the outlet opening.

It will be noted that all of the forms of the invention above described include a tank consisting of a plurality of tank compartments, a trough extending the full length of the tank under all of the compartments, valved openings controlling the flow of liquid from the several compartments into the trough and means controlling the flow of liquid from the trough out through the supply devices, the valves controlling the outlets from the several compartments being subject to individual selection and manipulation whereby liquid can be supplied from any selected compartment without affecting the others in any way. This construction is preferably employed in the form above described wherein the division of the tank into compartments is effected by partition plates which are extended below the tank proper to form supporting and strengthening means and in which the wrapper sheets of the several tank compartments are shaped to form sections of the trough, which sections are connected by openings through the extensions of the partition plates.

I claim:

1. A tank consisting of a plurality of tank compartments arranged in line, a trough extending lengthwise of the tank under all of the tank compartments, individual valves controlling the flow from the several compartments into the trough and means for controlling the outlet of liquid from the trough.

2. A tank comprising the combination of a plurality of tank compartments arranged in line, a trough extending lengthwise of the tank under all of the compartments and formed by bending the wrapper sheet of the tank to the form of a trough at the bottom of the tank, a wall constituting the top of the trough and the bottom of the tank compartments, valves controlling openings from the several tank compartments into the trough and means for controlling the outlet of liquid from the trough.

3. A tank comprising the combination of a plurality of tank compartments arranged in line, the end walls of the compartments being formed by partition plates which are extended beyond the wall of the tank, a trough extending lengthwise of the tank under all of the compartments and including openings through the partition plates, valves controlling the flow of liquid from each compartment into the trough and means for controlling the outlet of liquid from the trough.

4. A tank comprising the combination of a plurality of tank compartments arranged in line, each compartment formed by vertically disposed partition plates and a curved wrapper sheet and the partition plates having integral extensions projecting below the wrapper sheet, a trough extending lengthwise of the tank under all of the compartments formed by bending the wrapper sheet of each compartment to the form of the trough at the bottom of the compartment and the trough including openings in the extensions of the partition plates, a plate in each compartment secured to the wrapper sheet and forming the bottom of the compartment and the top of the trough, valves controlling the flow from the several compartments into the trough and means for controlling the outlet from the trough.

5. A tank comprising the combination of a plurality of tank compartments arranged in line and each consisting of vertically disposed partition plates and a wrapper sheet secured thereto, the wrapper sheet of each compartment being bent at the bottom thereof to form a trough, and the partition plates being provided with integral extensions projecting below the wrapper sheet and provided with openings for connecting the troughs of the several compartments, a plate in each tank compartment having its lateral edges welded to the wrapper sheet and located in position to form the bottom of the compartment and the top of the trough section of that compartment, valves controlling openings in the said plates of the several compartments, each having a stem extending upwardly through its compartment and the top wall thereof, and means for controlling the outlet of liquid from the trough.

6. A tank comprising a plurality of tank compartments arranged in line, a trough extending lengthwise of the tank under all of the compartments thereof, means for controlling the flow of liquid from any compartment into the trough and a siphon for withdrawing liquid from the trough, the siphon extending to a point above the level of the liquid in the tank.

7. A tank comprising a plurality of tank compartments arranged in line formed by

vertically disposed partition plates separating the several compartments, which partition plates are provided with integral extensions projecting below the bottom wall of the tank, a trough extending lengthwise of the tank under all of the compartments and including openings through the extensions of the partition plates, valves controlling the flow of liuid from the several compartments into the trough and a siphon extending from the trough up to a point above the tank for withdrawing liquid from the trough.

8. A tank comprising a plurality of tank compartments in line, each formed by vertically disposed partition plates and a curved wrapper sheet secured thereto, the partition plates being extended below the bottom surface of the wrapper sheet and the wrapper sheet being bent at the bottom thereof to form a section of a trough extending lengthwise of the tank under all of the compartments thereof and including openings through the extensions of the partition plates, a plate in each compartment secured at its lateral edges to the wrapper sheet and forming the bottom of the compartment and the top of the trough section of that compartment, valves controlling openings in said plates and a siphon extending from within the trough to a point above the top wall of the tank and controlling the flow of liquid out from the trough.

9. A tank comprising the combination of a plurality of tank compartments arranged in line, a trough extending lengthwise of the tank under all of the compartments, a siphon controlling the flow from each compartment into the trough and means for controlling the flow of liquid out from the trough.

10. A tank comprising a plurality of tank compartments arranged in line formed by vertical partition plates and a wrapper sheet secured thereto, the wrapper sheet being bent at the bottom thereof to form a trough section and the trough sections of the several compartments being connected by openings through the partition plates, a plate in each compartment secured to the wrapper sheet thereof and forming the bottom of the compartment and the top of the trough section, a siphon located in each compartment and controlling the flow of liquid from that compartment into the trough, and a siphon common to all of the compartments and controlling the flow from the trough to the exterior of the tank.

11. A tank comprising a plurality of tank compartments, a trough extending under all the tank compartments, and means for controlling the flow of liquid from the tank including independent valve means for each compartment and valve means for the trough.

12. A tank comprising a plurality of tank compartments, a trough extending under all the tank compartments, and means for controlling the flow of liquid from the compartments into the trough and a siphon for withdrawing the liquid from the trough.

13. A tank comprising a plurality of tank compartments, a trough extending under all the tank compartments, for the discharge therethrough of liquid from any tank compartment, and siphon means for controlling the discharge of fluid from any one of the tank compartments.

In testimony whereof I affix my signature.

ANDREW A. KRAMER.