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TANK WITH PROPORTIONING MEANS

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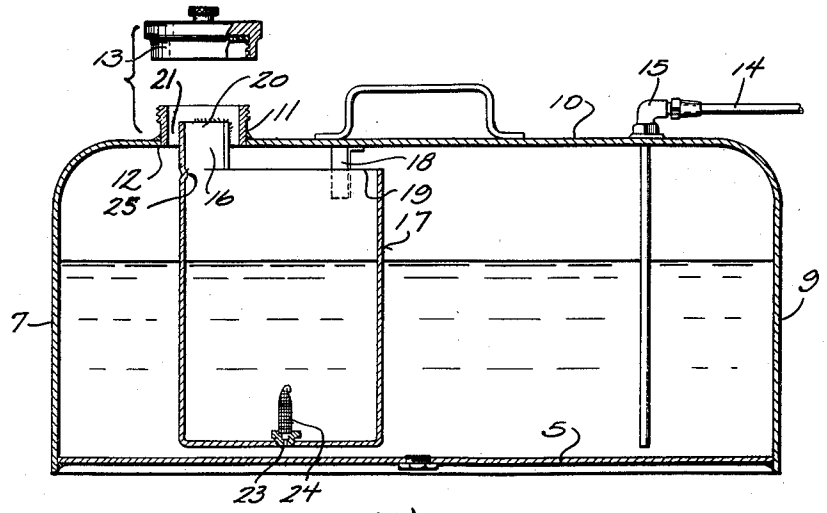

Fig. 1

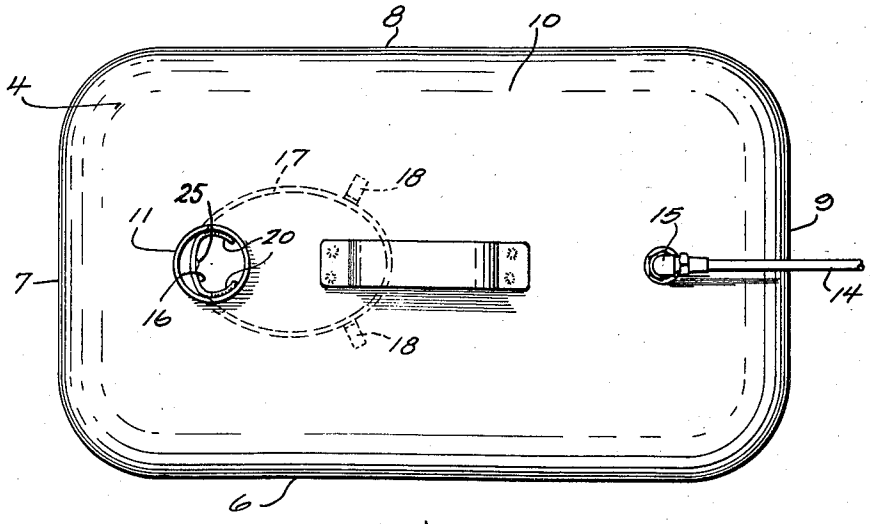

Fig. 2

INVENTOR.
THOMAS S. TUTTLE
BY
Lieber & Lieber
ATTORNEYS

United States Patent Office

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TANK WITH PROPORTIONING MEANS

Thomas S. Tuttle, 1674 N. 122nd St., Wauwatosa, Wis.

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This invention relates to a proportional mixing container for use in storing, mixing and dispensing different fluids. It finds particular utility in mixing fuel for internal-combustion engines.

The invention will be shown and described as having particular utility in connection with mixing fuel for two-cycle internal-combustion engines, but it will be understood that it may be used for proportional mixing of various fluids.

Some internal-combustion engines such as outboard motors or power lawn mower engines, for example, use gasoline for a fuel with which has been mixed a predetermined amount of oil for lubrication of the engine. It is essential to maintain the proper proportion between the gasoline and the oil, and this has presented a problem in refilling a partially empty tank containing such a mixture.

Conventional proportional mixing containers or fuel tanks have been proposed which have been provided with means for eliminating the necessity for separate containers for measuring the gasoline and the oil. These proportional mixing containers, however, usually require manually operated valves to effect the mixing, such valves requiring attention and adding considerably to the cost of such a container.

According to the present invention, there has been provided a proportional mixing container which requires no valves for its operation and which insures the correct proportion of different fluids.

The invention provides a container having therein a separate oil measuring receptacle with means for maintaining the levels of the fuel mixture in both the tank and the receptacle at the same height whereby both fluids can be added to the container at any time and regardless of the degree to which the container has been emptied.

The invention further contemplates a container of the above type which permits mixing of the fuel directly in the tank from which it is to be drawn for use. With this invention the fire hazard of such a mixing operation is considerably reduced. Furthermore, the mixing of the gasoline and oil is very thorough, and the device minimizes the possibility of entry of foreign matter by reducing the usual number of filling and measuring operations.

Carburetor adjustments and engine requirements are sensitive to fuel mixture variations which are caused by careless measuring or mixing. The container of this invention insures a consistent and thoroughly mixed lubricant fuel.

These and other objects and advantages will appear hereinafter, reference being had to the accompanying drawings, in which:

Figure 1 is an elevational sectional view of a container made in accordance with the invention; and

Figure 2 is a plan view of the container shown in Figure 1.

Referring more particularly to the drawings, the invention has been illustrated as applied to a remote fuel tank

4 of the type usable with an outboard negine. The tank is substantially rectangular in shape and has a bottom 5 welded to the walls 6, 7, 8 and 9. The tank has a top 10 formed integrally with the walls as would be formed by a stamping operation.

A collar 11 is welded in an aperture 12 located adjacent one end of the top 10, and the fuel and oil are both poured through this collar for filling the container as will appear. The top end of the collar is threaded to receive the vented cap 13 in sealing relationship therewith.

A fuel line 14 is removably secured to the elbow 15 which is screwed into the top of the tank and is in communication with the interior of the tank for removing the mixture from the tank by suction in the well-known manner. The tank 4 is located at a distance remote from the engine, and the fuel mixture is supplied to the engine via the fuel line 14.

An oil receiver 17 is secured within tank 4 by the supports or braces 18 which may be welded or otherwise secured to the receiver and to the tank before the bottom 5 is welded in place. The receptacle or receiver 17 has an upstanding portion 16 which is formed by cutting an upper portion of the receiver away to define an upper edge 19 of the receiver. Each side of the upstanding portion 16 is turned inwardly to form curved attaching portions 20 which are welded within the collar. Thus a rigid and rattle-proof structure is formed.

The upper portion 16 forms a baffle within the collar 11 and, as viewed in Figure 2, when the fluid is poured into the collar, it is directed so as to enter the oil receptacle as the portion 16 occupies the majority of the space within the collar.

The bottom of the oil measuring receptacle has a small aperture 23 therethrough which acts as a bleed hole, and a screen filter 24 preferably covers this hole to prevent any sediment, which may have accidentally entered the receptacle, from plugging the bleed hole. This bleed hole and filter assemblage is preferably removable for cleaning or replacement and may be located at any convenient location in the receptacle bottom.

Assume the container is completely empty and it is desired to mix a correct proportion of two different fluids. The receptacle 17 would first be filled with one fluid, such as oil, by directing it into the upstanding portion 16 until the oil reaches the level indicated by the projetcion 25 which is located slightly below the overflow edge 19 of the receptacle 17 and is clearly visible through the top of the collar. The other fluid, such as gasoline, is then likewise poured into the receptacle 17 until the tank 4 is completely filled, and it will be noted that air is permitted to escape from the tank through the space 21 between the baffle 16 and collar 11 during this filling operation. The resulting mixing action between the oil and gas is one of considerable turbulence, which results in a thorough mixture flowing from the receptacle over the top edge 19 thereof. When the tank has been completely filled, the correct pre-determined proportion has been reached; and the same procedure is followed for filling the tank regardless of the existing level therein at the time of filling.

During fuel withdrawal from the container, the levels of the mixture in the receptacle and in the tank proper remain the same as the bleed hole 23 permits restricted fluid communication therebetween.

It may be desired to again fill the tank with the mixture at any time, and regardless of the level of the mixture remaining in the container, the correct proportions of mix will be attained in filling the same as described. By means of this invention no guesswork is involved in mixing the correct proportions for the new batch. It is

simply necessary to fill the receptacle with oil to the indicator **25** and then completely fill the container, via the receptacle, with gasoline.

With this construction there are no valves to adjust or manipulate, the mixing process is extremely simple and requires no separate mixing cans, which in themselves are a fire hazard. The container is sealed by its cap immediately after filling, and no fumes will remain in the area.

The container may also be used to safely store the fuel mixture for indefinite periods. Likewise, the receptacle **17** may be of any given volume proportionate to the volume of the tank **4** depending upon the desired mixture. As for the bleed hole **23**, it is believed obvious that it should be of sufficient size to permit the level in the receptacle **17** to recede with substantially the same speed as the level in the tank **4** upon withdrawal of fuel mixture through the line **14**, but it should also be small enough to insure retention of substantially all of the oil poured therein during the filling process as above described.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. A proportional measuring and mixing fuel container for internal combustion engines comprising, a primary fuel tank for a gasoline and oil mixture, said tank having an upper fuel supply inlet, a removable cap normally closing said inlet, an oil measuring receptable approximately co-extensive in height with said tank secured therein in communication with said inlet, said receptacle having a transverse sectional area at all levels thereof in substantially constant predetermined proportion to the transverse sectional area of said tank at corresponding levels, and means providing an air vent passage leading from the interior of said tank exteriorly of said receptacle and through said tank inlet to the atmosphere, said receptacle also having a bleed hole adjacent the bottom thereof for constantly permitting restricted fluid communication between said tank and said receptacle, said bleed hole being sized to permit equalization of fluid levels between the interiors of said tank and receptacle at maximum normal rates of fuel withdrawal from said tank while not materially varying the differential in fluid levels therebtween during normal introduction of oil to said receptacle.

2. A proportional measuring and mixing fuel container for internal combustion engines comprising, a primary fuel tank for a gasoline and oil mixture, said tank having an upper fuel supply inlet, a removable cap normally closing said inlet, an oil measuring receptacle approximately co-extensive in height with said tank secured therein in communication with said inlet, said receptacle having a transverse sectional area at all levels thereof in substantially constant predetermined proportion to the transverse sectional area of said tank at corresponding levels, means forming segregated filling and air vent passages extending into said inlet, said air vent passage leading from the interior of said tank exteriorly of said receptacle to the atmosphere, and means forming a constantly open overflow passage placing the upper portion of said receptacle in communication with the interior of said tank, said receptacle also having a bleed hole adjacent the bottom thereof for constantly permitting restricted fluid communication between said tank and said receptable, said bleed hole being sized to permit equalization of fluid levels between the interiors of said tank and receptacle at maximum normal rates of fuel withdrawal from said tank while not materially varying the differential in fluid levels therebetween during normal introduction of oil to said receptacle.

3. A proportional measuring and mixing fuel container for internal combusion engines comprising, a primary fuel tank for a gasoline and oil mixture, said tank having an upper fuel supply inlet, a removable cap normally closing said inlet, an oil measuring receptacle approximately co-extensive in height with said tank secured therein in communication with said inlet, said receptacle having a transverse sectional area at all levels thereof in substantially constant predetermined proportion to the transverse sectional area of said tank at corresponding levels, and means forming a filling passage extending through said inlet in direct communication with said receptacle and cooperating with said inlet to provide a segregated air vent passage leading from the interior of said tank exteriorly of said receptacle and through said tank inlet to the atmosphere, said receptacle also having a bleed hole adjacent the bottom thereof for constantly permitting restricted fluid communication between said tank and said receptacle, said bleed hole being sized to permit equalization of fluid levels between the interiors of said tank and receptacle at maximum normal rates of fuel withdrawal from said tank while not materially varying the differential in fluid levels therebetween during normal introduction of oil to said receptacle.

4. A proportional measuring and mixing fuel container for internal combustion engines comprising, a primary fuel tank for a gasoline and oil mixture, said tank having an upper fuel supply inlet, a removable cap normally closing said inlet, an oil measuring receptacle approximately co-extensive in height with said tank secured therein in communication with said inlet, said receptacle having a transverse sectional area at all levels thereof in substantially constant predetermined proportion to the transverse sectional area of said tank at corresponding levels, means providing segregated filling and air vent passages leading respectively directly through said inlet to said receptacle and from the interior of said tank exteriorly of said receptacle to the atmosphere, and means spacing the upper edge of the receptacle side wall from the upper wall of said tank to place said receptacle in constant communication with the interior of said tank and provide a constantly open overflow passage, said receptacle also having a bleed hole adjacent the bottom thereof for constantly permitting restricted fluid communication between said tank and said receptacle, said bleed hole being sized to permit equalization of fluid levels between the interiors of said tank and receptacle at maximum normal rates of fuel withdrawal from said tank while not materially varying the differential in fluid levels therebetween during normal introduction of oil to said receptacle.

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