July 8, 1930. G. W. HANSON 1,770,033

PNEUMATICALLY DISCHARGED LIQUID CONTAINER

Filed Oct. 10, 1925

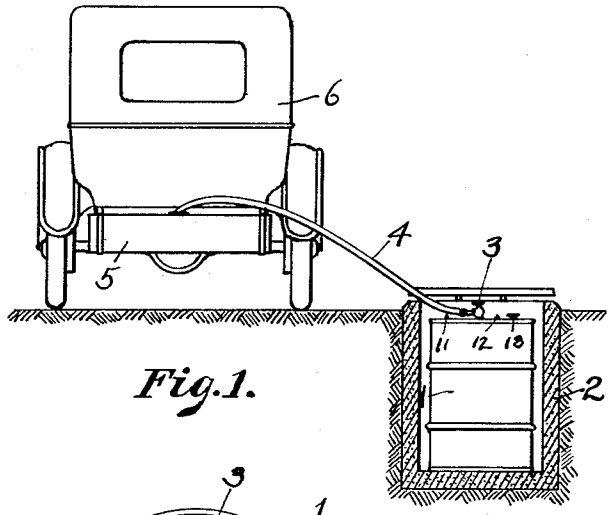


Fig. 1.

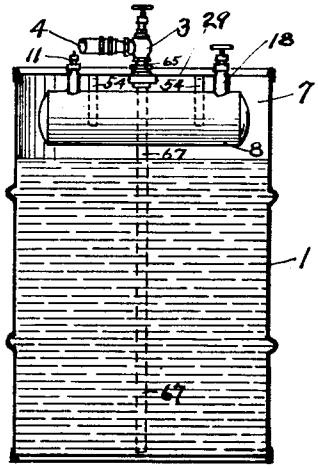


Fig. 2.

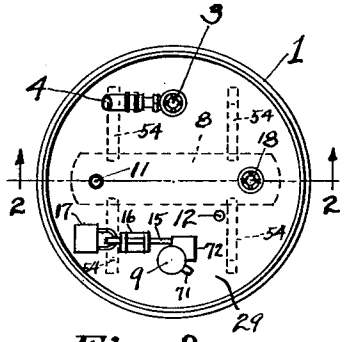


Fig. 3.

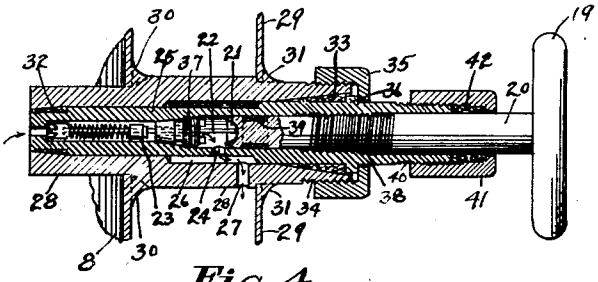


Fig. 4.

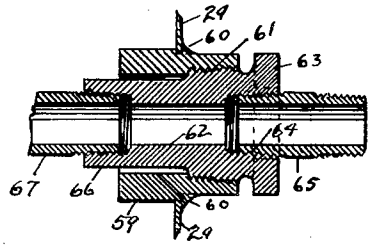


Fig. 6.

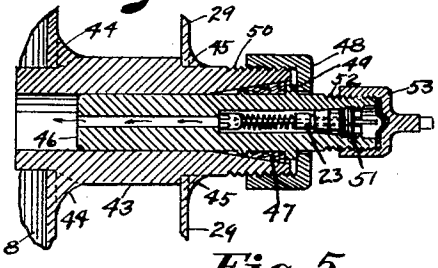


Fig. 5.

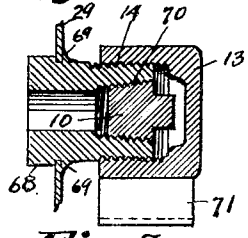


Fig. 7.

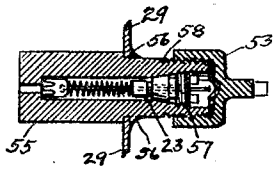


Fig. 8.

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UNITED STATES PATENT OFFICE

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PNEUMATICALLY-DISCHARGED LIQUID CONTAINER

Application filed October 10, 1925. Serial No. 61,807.

My invention relates to containers in common use, such as steel barrels or drums, that by the nature of their construction do not withstand the high air pressure arrived at when such containers are used similarly to the pneumatic water system. My invention was primarily to furnish private individuals, containers of low cost for use in storing small quantities of gasoline for use in automobiles, for fuel oil for oil burners, and such other liquids which are required by insurance regulations, city ordinances and loans to be placed underground, away from the buildings they serve. To make this practical, pressure had to be used in some way to elevate the liquid above the ground to its place of use, I conceived the idea of using an auxiliary tank for storage of compressed air, which would be filled by the vendor when he puts the fluid in the container, and have the compressed air tank connected to the container by an air line with a valve to release the air to the container as needed, and not to exceed the safe pressure the container can withstand.

In order to reduce excessive cost of fittings and valves, valve cores such as are in automobile tube valve stems were selected for air valves as being easy and cheap to replace, and large enough to handle the quantity of air used. In order to make a compact article to handle and install, the compressed air tank is welded fast to one barrel head with all the other necessary opening fittings so that when the head is put in the barrel in the process of its manufacture the air tank will be within the barrel. The purpose of this invention in the case of gasoline is to give the individual car owner on his own premises, a filling station for his own use that will give him the same service as any filling station pump would at a much less initial cost. This container can be placed anywhere to suit the owner's convenience under ground in a masonry or concrete pit, with cover that can be locked for protection against theft.

For convenience and use of the vending company I have placed means for locking the filling opening so that when it places these containers on its routes, it can furnish the truck drivers with the key that unlocks this filling opening, so that none but its authorized salesmen can fill these containers.

I attain these objects by the mechanism illustrated in the accompanying drawing, in which—

Fig. 1 shows one of the uses of the invention.

Fig. 2 is a vertical section of the barrel on the line 2—2 Fig. 3.

Fig. 3 is a plan view of the top head of the barrel.

Fig. 4 is a longitudinal section of the compressed air release valve.

Fig. 5 is a longitudinal section of the air inlet valve.

Fig. 6 is a cross section of the connection to the barrel head of the drainage pipe fittings.

Fig. 7 is a cross section of the connection to the barrel head of the filling fitting with the plug and locking cap.

Fig. 8 is a cross section of the connection of the secondary air inlet valve to the barrel head.

Similar numerals refer to similar parts throughout the several views.

This invention may be used whenever fluids are needed to be lifted or when the viscosity of the fluid is such that it will not flow readily by gravity pressure.

In the drawings I have shown one of the uses of my invention in the handling of gasoline from the barrel to the automobile tank which is illustrated in Fig. 1, in which 1 is a barrel or container. 2 is a concrete or masonry pit, 3 is the control valve of the outflow of the gasoline and the hose 4 leading to the gasoline tank 5 on the rear of the automobile 6. By opening the valve 3, by the operator the gasoline will flow from the barrel 1 to the tank 5 by reason of the pressure exerted by compressed air in the space 7 above the fluid within the barrel 1.

To secure enough air pressure at all times to completely empty the barrel an auxiliary tank 8 for compressed air is installed, preferably within the barrel and during the process of its manufacture. This tank 8 is of adequate size and strength to furnish sufficient air under pressure and strong enough

to withstand the pressure when it is filled with enough air in large enough quantity so that when it is released into the space 7 as needed, it will completely empty the barrel.

The vendor of the fluid used which in the case illustrated, is gasoline, fills the barrel at the opening at 9 leaving the space 7 then closing tightly the opening at 9 with the plug 10. Then from an auxiliary tank and compressor on his truck, he fills the air tank 8 with compressed air to the required pressure through the air inlet valve 11, then fills the space 7 with air to approximately twenty pounds through the air valve 12. After screwing the cap 13 on 14, he places the rectangular bar 15 thru the hasp guide 16 which is welded to the head 29 of the barrel 1, inserts and locks the lock 17, and his work is completed. He has sold with his gasoline, service in the way of energy stored up in compressed air that will force the gasoline out of the barrel as needed. The owner then, as he needs the gasoline, will place the end of the hose 4 or nozzle in the opening of the tank on the automobile, open the valve 3 and the gasoline will flow from the barrel 1 to the gasoline tank 5, and as he needs pressure within the barrel he opens the release valve 18 by turning the hand wheel 19 counter-clockwise, the stem 20 moves downward and its cupped end 21 pushes the end of the valve pin 22 so that the valve 23 is opened and the air escapes through the opening 24 in the tubular valve shell 25 to the annular space 26 and out through the opening 27 in the outer tubular shell 28, thence to the space 7 above the gasoline in barrel 1, regulating the pressure according to a low pressure tire gage held on 12, allowing enough air to escape to the empty space 7 of the barrel till the required pressure is reached, then turning the hand wheel 19 clockwise until the pin 22 is released and the valve 23 closes.

I have elected to show a hand operated release valve on account of its simplicity, but a release valve automatically regulated by the selected pressure of space 7 can be used instead of the manually operated valve and either are within the scope of my invention as to use in the combination.

All the air valves are equipped with the same kind of valve cores as used in the valve stem of automobile tire tubes, and the valve shells are designed so that the valve cores can easily be changed at any time when required.

The construction of the complete air release valve 18 is shown in a longitudinal cross section in Fig. 4 where the outer tubular shell 28 is welded to the tank 8 at the shoulder 30, and welded to the barrel head 29 at the shoulder 31. Within shell 28 is fitted the inner tubular valve shell 25 having a rubber, cork or fibre annular packing at 32 and another packing at 33, while at the threaded end 34 is screwed a nut 35 which presses against the annular projection 36 and forces the shell 25 so that the packing 32 will stop air leakage from the tank 8 and the packing 33 will prevent air leakage from the space 7 within barrel 1. Within the valve shell 25 is screwed fast the valve core 23 at 37 with the valve pin 22 of extra distance extending some length above 37 where the cupped end 21 of the stem 20 can reach it to press downward and open the valve 23. The stem 20 has a threaded section at 38 fitting in left hand threads tapped in the shell 25 so that by the rotation of 20 counter clockwise the cupped end 21 of 20 will be moved downward against pin 22 and caused to open the valve 23, allowing the air to pass upward and out thru the opening 24 to the annular space 26 and out thru the opening 27. Rotating the stem 20 clockwise will cause the cupped end 21 of 20 to move upward away from the valve pin 22 and allow the valve 23 to close. At 39 is placed another annular packing to close leakage from the annular space 26 while at the end 40 of the shell 25 is screwed a nut 41 with a rubber or fibrous packing at 42, so as to further pack the stem 20 from air leaks. The use of left hand threads on 20 at 38 is to make the movement of the hand wheels on all valves alike, that is, rotation counter clockwise will open, and rotation clockwise will close the valves, the same as the standard globe valve 3.

The inlet air valve 11 as shown in Fig. 5 is constructed somewhat similar to the air release valve in that it has an outer and an inner tubular shell where the outer tubular shell 43 is welded to the air tank 8 at 44 and to the barrel head 29 at 45. Within the shell 43 is fitted a tubular valve shell 46 with a conical annular packing ring at 47 which is pressed tightly to its seat by the nut 48 which bears on the annular flange 49 when the nut 48 is screwed on the threaded end 50 of the outer tubular shell 43. Within the tubular valve shell 46 is scewed fast the valve core 23 at 51 and at the threaded end 52 is screwed a standard tire valve cap 53.

The compressed air tank 8 is fastened to the barrel head 29 by the welded joints of the tubular shells 28 and 43, but to brace and make rigid the connection and release from strains the welded connections, pairs of braces 54 are welded to the tank 8 and to the barrel head 29 as shown in Figures 2 and 3.

The secondary air inlet to barrel 1 is indicated at 12 and is shown in section in Fig. 8 where the tubular valve shell 55 is welded to the barrel head 29 at 56. The valve core 23 is threaded at 57 and closed with cap 53 screwed fast to the threaded end 58, valve cap 53 screwed fast at the threaded end 58 of 55. This valve 12 is used to gauge the pressure in the space 7 and also to charge air

through it to the space 7 with an automobile hand pump in emergencies.

The connection to the barrel head 29 of the out flow or drainage opening to which the control valve 3 is fastened is shown in section in Fig. 6, where the tubular shell 59 is welded at 60 to the barrel head 29 the outer end 61 being tapped for a standard size pipe in which a special bushing coupling 62 is screwed. At its outer end bushing 62 is fashioned with a hex nut 63 and it is tapped at 64 for the nipple 65 to which nipple the valve 3 is screwed and at the lower end 66 the bushing is tapped for a pipe 67 which reaches to a point close to the bottom of barrel, so that the liquid will flow upward and out through the valve 3 when it is opened and out through the hose 4 or any connection that the installation and use requires.

The filling opening is shown in section in Fig. 7 where the tubular shell 68 is welded to the barrel head 29 at 69, having screwed on the outer threaded end the cap 13, while the interior of the end 14 is tapped at 70 for the pipe plug 10. On the cap 13 is a lug 71, which, together with a block 72 on the bar 15, prevents turning of the cap after the padlock 17 is locked in place. The vending company's truck driver will have a master key to the locks on all the barrels on his route so that no one else can have access to the barrels and supply the liquid sold.

In the manufacture of the steel barrels or drums, the air tank 8 is welded to the tubular shells 28 and 43. The shells are then welded to the barrel head 29, the braces 54 are welded to the air tank 8 and to the barrel head 29, and then the tubular shells 55, 59, and 68 are welded to the barrel head 29, after which the barrel head is lock seamed to the barrel in the customary maner.

Although I have illustrated the auxiliary air tank welded to one of the heads of the barrel as the preferred construction, this tank can be welded to the cylindrical shell of the barrel which position or arrangement does not in any way deviate from the principle of my invention as the changing of position or shape of the air tank does not change my invention. Therefore, the auxiliary air tank 8 may be placed outside of the barrel and a pipe screwed into and leading from the opening 27 to and connected to an opening in the barrel head 29 and accomplish the same purpose and not deviate in any way from the principles of my invention.

I have illustrated in Fig. 1 one of the uses of my invention showing a steel barrel and a hose as a filling station gasoline pump but my invention can be put to many other uses such as a supply tank to oil burners where insurance regulations and restrictions require the fuel oil tank to be placed under ground and also for supplying lubricating oil in stations and garages where, for space and convenience it is desirable to put the barrels under the floor.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

The combination with a liquid dispensing drum having a supply inlet to the drum, an outlet pipe terminating near the bottom of the drum and a control valve in said pipe exterior of the drum, of a compressed-air tank inclosed in the top of said drum, a valve bushing joining said drum and tank and an air inlet-valve in said bushing accessible from the exterior of the drum, a second valve bushing joining the drum and tank and a valve device in said bushing accessible from the exterior of the drum for controlling passage of air under pressure from the tank to said space.

GUSTAF WILLIAM HANSON.