Sept. 18, 1934. D. WORTMANN 1,974,091

FLAME ARRESTER FOR GASOLINE TANKS

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Fig. 1

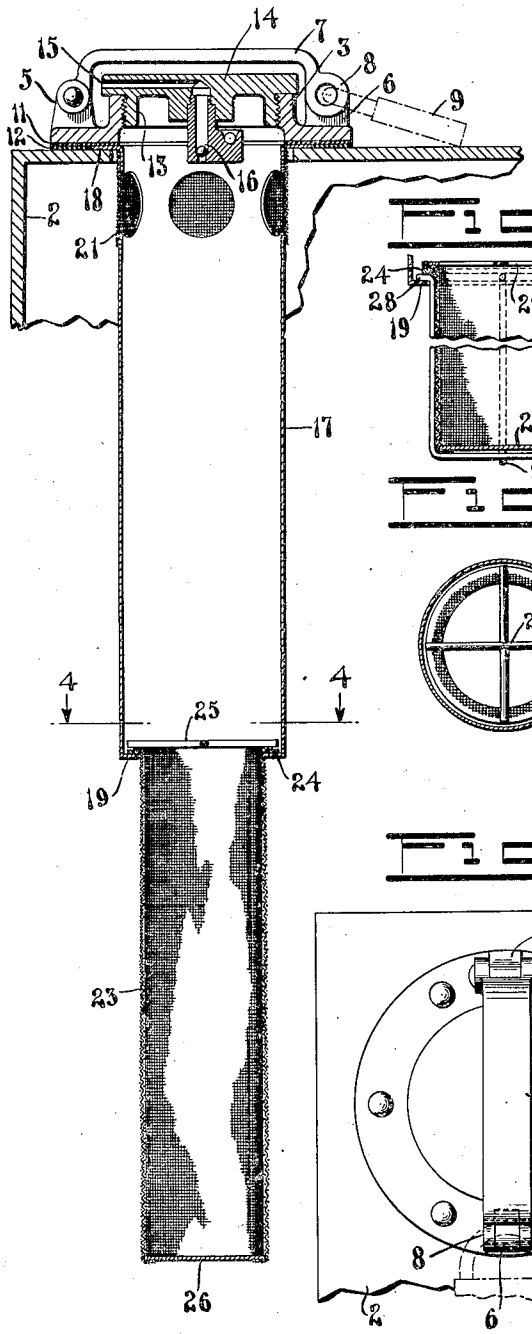
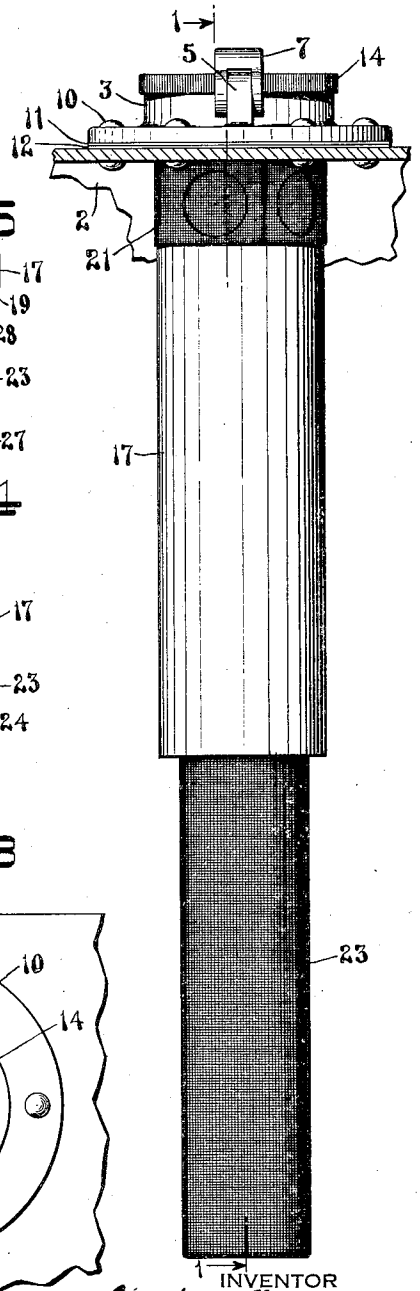


Fig. 5

Fig. 4

Fig. 3

Fig. 2



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FLAME ARRESTER FOR GASOLINE TANKS

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4 Claims. (Cl. 220—88)

My invention relates to inlet ports for gasoline tanks, and more especially to portable tanks such as commonly employed at filling stations for servicing motor cars.

The main object of my invention is to provide a flame arrester for the inlet port of such tanks so that when charging such tanks accidental ignition of the gaseous vapor escaping from the tank will not ignite the gas within the tank. For this purpose I employ a wire gauze shield for the inlet port as hereinafter described in detail.

Devices of this character have been proposed but have not proved effective for various reasons. In filling gasoline tanks from storage or supply tanks it is common practice to use a hose connection having a metal nozzle, and which nozzle is inserted in the filling port of the tank to be filled. Safety devices heretofore proposed for such ports have been damaged and rendered unsafe by contact with the nozzle, especially where the nozzle came into direct contact with the safety screen. In others the inlet and vent ports were ineffective, and did not guard against overflooding and splashing up through the inlet. And in others the safety screen was not readily removable for inspection, repair or replacement, and unless such device could be readily inspected there could be no certainty of avoiding explosion due to possible entrance of flame into the tank. And in still others the closure for the filling port, or the port itself was readily removable from the tank, leaving the tank and contents unprotected. These and other disadvantages my invention is designed to overcome.

In carrying my invention into effect I provide an inlet tube for the filling port which is rigidly attached and not removable, and of such proportions as to insure the safety screen against contact with or damage by the filling nozzle without detracting from its protective feature. The main safety screen will be of such proportions as to provide amply area for the inflow of liquid, thereby preventing overflooding and splashing at the entrance of the inlet port, and this screen will be so constructed and supported by the inlet tube that it may be readily inspected without actually removing the same from the inlet tube, permitting quick replacement when necessary, and thereby insuring absolute safety.

My invention is illustrated in the accompanying drawing, in which Figure 1 is a central vertical section of the filling port; Figure 2 a vertical elevation; Figure 3 a top view; Figure 4 a cross section on the line 4—4 of Figure 1; and Figure 5 a vertical section of the main flame screen showing additional support and protection for the screen.

Referring to the drawing, 2 indicates a portion of the tank, 3 a flanged fitting having a pair of lugs 5 and 6. To lug 5 is hinged a locking bar 7 having a pair of eyes 8 adapted to register with an eye in lug 6 for receiving the hasp of a pad-lock 9. The fitting 3 is rigidly secured to the tank top by rivets 10 and made fluid-tight by gaskets 11 and 12. Fitting 3 is internally screw-threaded to receive the threaded hub 13 of cap 14. This cap is provided with a vent port 15 and ball check valve 16 permitting escape of gases from the tank, but checking free entrance of air into the tank. It will be observed by reference to Figure 1 that when bar 7 is locked in position over the cap 14, the cap cannot be entirely unscrewed or removed from the fitting 3, and consequently in order to open the filling port for charging the tank, the pad-lock 9 must be removed. Seated in the opening in the tank and clamped under the flange of fitting 3 is a guard tube 17 having outwardly extending flange 18 at its outer end and an inwardly projecting flange 19 at its inner end. Flange 18 rests on the tank top and is encircled by gasket 12, and a gasket 11 which is the full width of the flange of fitting 3 is laid over flange 18 and gasket 12 so that when fitting 3 is riveted to the tank top a fluid tight joint is made. Tube 17 is provided with a plurality of circular openings 20 to serve as vent ports and these ports are covered by a fine wire mesh 21 which is fitted closely around the tube 17, with the ends abutting and thoroughly soldered together as shown by the line 22 (Figure 2) and also soldered to the tube to hold the screen in place over the vent holes. These holes are of such diameter relative to the diameter of the filling nozzles ordinarily employed that the rim of the nozzle when inserted into tube 17 cannot enter holes 20 and come into contact with wire screen 21. Resting on the flange 19 is a cylindrical screen 23 of fine wire mesh. At its upper end this wire mesh is bent over and thoroughly soldered to a flat metal ring 24 by means of which the screen 23 is supported on flange 19. Soldered to the upper side of ring 24 and to the wire mesh are two cross wires 25 which are provided to stiffen the supporting flange 24 of the screen and to afford a means for engagement by a hook to raise the screen in tube 17 for inspection and cleaning. The lower or inner end of the screen is closed by

a metal disk 26 over the edge of which the wire mesh is bent and thoroughly soldered. This disk serves to stiffen screen 23 at the bottom and maintain its cylindrical form, and prevents ripping at the bottom due to the pressure of the incoming column of liquid when filling the tank. The cylindrical screen 23 is made of a fine wire mesh, about 40 to the inch, and consequently its length will be such as to afford ample discharge opening for the incoming liquid when charging the tank, and thereby prevent overflooding or splashing at the entrance of the filling port.

In Figure 5, I have shown an additional support for the screen 23. In this view is shown a pair of U-shaped hangers made of round wires 27 having hooked ends 28 for suspending the screen from flange 19. In the preferred arrangement these support wires will be soldered together where they cross at the bottom, and also to the bottom plate 26 and to the flat ring 24, so that the hangers and screen will form a single unit. In this view I have also shown instead of the cross wires 25 a flat metal ring 29 with cross-arms punched from sheet metal, and which ring is soldered to the flat ring 24 and wire mesh of the screen. Support wires 27 serve not only to support and strengthen the screen, but serve also to guard the screen from injury through rubbing against flange 19 when the screen is raised in tube 17 for inspection and lowered again into hanging position on flange 19. Also the wire supports 27 will prevent stretching and possible rupture of the screen due to impact of the incoming column of liquid from the filling nozzle when re-charging the tank.

It will be understood that the filling nozzle as commonly in use is so much smaller in diameter than tube 17 that when such nozzle is inserted in the tube there will be a clearance between the nozzle and tube, and hence the screened holes 20 will serve as vent holes for the tank permitting escape of air as the tank fills, and the screen 21 at the same time will serve as a flame arrester. It will also be understood that while screen 23 serves primarily as a flame arrester it also serves as a strainer to catch any foreign matter that may enter with the liquid when the tank is being recharged. It will also be observed that the tubular screen 23 may be raised in tube 17 to a point where the entire mesh may readily be examined without entirely removing the screen from the inlet port so that at no time is the tank without the flame arrester at the inlet except when actually removed for replacement, and it will be seen that the entire arrangement is so simple that a new screen may be quickly dropped in place.

What I claim is:

1. In apparatus of the class herein described, the combination with a tank, of an inlet port, a closure therefor, a tubular member rigidly fixed to and forming part of said port, said tube having an inwardly bent flange at its inner end, a cylindrical flame screen having an outwardly bent flange and re-enforcing ring at one end for suspending same from the tube flange, means on said screen adapted to be engaged by a tool for removing the screen from the tube, and a metal disk closure at the inner end of said cylindrical screen.

2. In apparatus of the character defined in claim 1, the combination with the screen of wire guard hangers, said screen, re-enforcing ring, disk and hangers being secured together to form a unitary structure.

3. In apparatus of the class herein described, the combination with a tank having a filling port, a tubular member projecting into the tank, rigidly attached and forming part of said port, and adapted to receive and entirely house a filling nozzle, a tubular flame screen member removably suspended from and completely screening the orifice at the lower end of said tubular member, and means for reinforcing and facilitating the withdrawal of such screen through said tubular member.

4. In apparatus of the class herein described, the combination with a tank, of an inlet port, a closure therefor, a tubular member projecting into the tank, rigidly attached and forming part of said port and of a length adapted to receive and entirely house a filling nozzle, an inwardly projecting flange at the lower end of said tubular member, and a tubular flame screen suspended from said flange out of contact with such nozzle, and having an outwardly projecting flange engaging the flange of said tubular member and co-operating therewith to entirely screen the lower end of said tube.

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