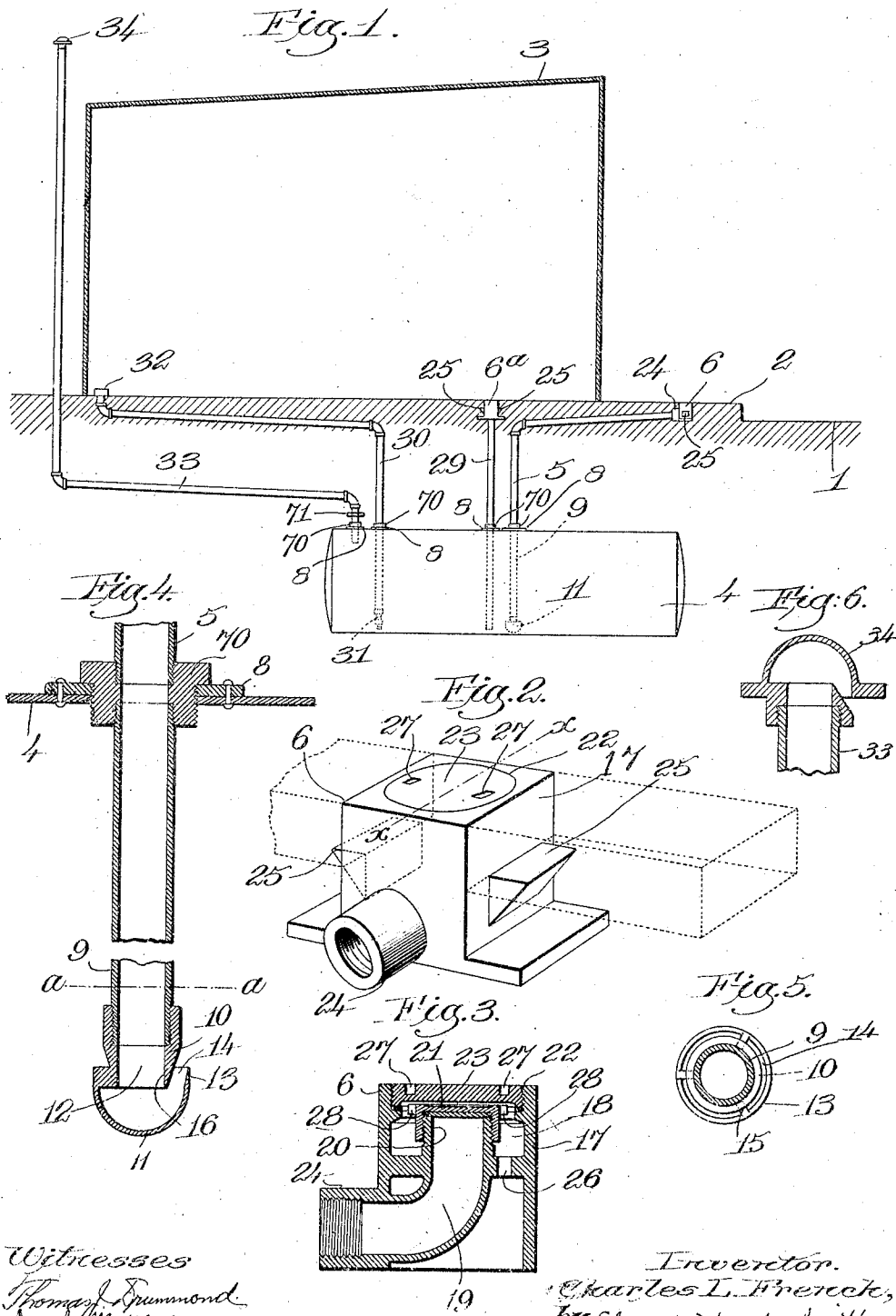


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 APPARATUS FOR STORING GASOLINE AND OTHER INFLAMMABLE OIL.
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR STORING GASOLENE AND OTHER INFLAMMABLE OIL.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES L. FRENCH, a citizen of the United States, residing at Cambridge, county of Middlesex, State of Massachusetts, have invented an Improvement in Apparatus for Storing Gasolene and other Inflammable Oil, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to apparatus for storing and handling gasolene, naphtha, and other liquids, and while the apparatus is capable of general use, the construction herein shown is well adapted in many particulars for use in storing gasolene at a garage.

It is now the common practice to store gasolene in tanks which are buried beneath the surface of the earth, and usually these tanks are provided with a filling pipe by which they may be filled and a suction pipe adapted to be connected to a pump and through which the gasolene may be withdrawn from the tank. Owing to the volatile nature of gasolene, it is very difficult to handle it without generating a considerable quantity of the gasolene fumes, and unless extreme precaution is taken, the generation of these gasolene fumes is likely to become a source of danger.

One of the objects of my invention is to provide a storage tank for gasolene which is so constructed that the hazard of storing gasolene therein is reduced to a minimum and so arranged that it can be filled from a distant point without generating any appreciable quantity of gasolene fumes and also so arranged that the depth of the gasolene in the tank can be measured at any time and even while the tank is being filled, and otherwise to improve storage systems for gasolene of this general nature, all as will be more fully hereinafter described and then pointed out in the appended claims.

Referring to the drawings wherein I have shown a selected embodiment of my invention, Figure 1 is a view showing my improved storage system as it might be used in connection with a garage; Fig. 2 is a perspective view of the filling box; Fig. 3 is a section through the filling box on the line *a-a*, Fig. 2; Fig. 4 is a fragmentary view showing part of the tank with the bushing

and the filling pipe connected thereto and also the splash preventer and seal at the lower end of the filling pipe; Fig. 5 is a section on the line *a-a*, Fig. 4; Fig. 6 is a sectional view of the cap for the vent pipe.

My improvements are adapted for use in connection with a storage tank for the storage of any liquid and situated in any location. In order to illustrate the principle of the invention I have shown it herein as it might be used in connection with a tank for the storage of gasolene or naphtha at or adjacent to a garage, but I wish it understood that the invention is not limited in its use to the storage of any particular liquid nor to any particular location.

As herein shown 1 designates a street or roadway having a sidewalk 2 along the same, and 3 designates generally a garage or other building. The storage tank for the gasolene or naphtha is shown at 4 and it is illustrated as being buried in the ground beneath the garage at some suitable point.

My improved apparatus comprises a filling pipe of novel construction arranged so that the tank 4 can be filled from the sidewalk or from some other point outside of the garage, or other building, a separate gage pipe which is situated so that a gage rod may be inserted into it to measure the depth of liquid in the tank at all times, a suction pipe through which the liquid is withdrawn from the tank, and a vent pipe for carrying off any fumes which may be generated within the tank, these four pipes all being separate and distinct from each other.

The filling pipe is shown at 5 and in the present embodiment of my invention it leads to a filling box 6 which may conveniently be located in the sidewalk 2. This pipe 5 is connected to the tank by means of a usual boiler flange construction which is shown best in Fig. 4, and which comprises a flange 8 secured to the tank, and a bushing 70 screwed into the flange and adapted to have the pipe 5 screwed thereto. The bushing 70 also has screwed into its inner end a delivery pipe 9 which extends substantially to the bottom of the tank 4, and this delivery pipe is provided at its lower end with a combined splash preventer and seal which operates both to prevent the entering gasolene from splashing or dashing against the bottom of the tank and thus

stirring up any sediment or water which may be present and to seal the bottom of the filling pipe so as to prevent any gasoline fumes in the tank from escaping there-
 5 through. This seal also has the advantage that in the case of fire or accident to the filling pipe 5, it operates to prevent any flame or spark from entering the tank and thus causing an explosion. The seal herein
 10 shown will preferably be of a size to be readily inserted through the opening in the flange 8 so that said seal may be attached to the bottom of the pipe 9, and said pipe
 15 may then be screwed into the bushing 70, and then the pipe 9 with the seal attached may be inserted through the opening in the flange 8 to permit the bushing to be screwed into place.

The combined splash preventer and seal is shown best in Figs. 4 and 5 and comprises
 20 a body portion 10, an opening 12 there-through and interiorly screw-threaded to screw onto the end of the pipe 9, and a bowl-shaped deflector 11 situated beneath the
 25 body and arranged so that the gasoline issuing from the pipe 9 will strike the deflector and be deflected outwardly and upwardly thereby. The diameter of the deflector at the annular delivery edge 13 there-
 30 of is larger than that of the body 10 so that an annular discharge space 14 is formed through which the gasoline is delivered in an annular sheet, and this annular dis-
 35 charge space will preferably have a larger cross sectional area than that of the passage 12, as clearly seen in the drawings, so that the stream of gasoline which is delivered
 40 through the passage 12 will flow out through the discharge space 14 with a gentle movement which will obviate entirely any splash and the consequent formation of gasoline vapors. This deflector 11 is secured to the
 45 body 10 in any suitable way, as by means of webs 15. In order that the diameter of the deflector at the edge 13 thereof may be such as to admit of the device being passed through the opening in the flange 8, and yet have a discharge opening 14 of sufficient
 50 area, I propose to make the body 10 tapering at its lower end, as at 16. The upper edge 13 of the deflector is situated above the level of the lower end of the body 10 so that when the bowl-shaped deflector is full of gasoline, the lower end of the passageway
 55 10 will be sealed and will remain sealed even when the liquid level falls below the bowl.

The gasoline which is delivered through the pipe 9 will by its contact with the deflector be converted into a sheet which will
 60 be delivered through the discharge opening 14 and will flow over the edge 13 in a more or less gentle stream which will not cause the generation of any appreciable amount of gasoline fumes, as would be the case if
 65 the gasoline were delivered directly from

the pipe 5 which usually ends at the top of the tank. Where the pipe does thus end at the top of the tank the stream of gasoline issuing therefrom impinges against the bot-
 70 tom of the tank with such force as to cause considerable foam and agitation of the liquid and a consequent generation of gasoline fumes.

As stated above the pipe 5 connects with
 a filling box 6 which comprises a chambered
 75 body portion 17 formed with the interior chamber 18 and constructed with a passage-
 way 19 which leads to the pipe 5. The pas-
 80 sageway 19 terminates at its upper end in a screw-threaded nipple 20 situated within
 the chamber 18, and this nipple is adapted for hose connection and is preferably closed
 by a cap 21 screw-threaded thereon, said
 cap being situated entirely within the cham-
 85 ber 18. The filling box is provided with the opening 22 leading to the chamber 18,
 and this opening is adapted to be closed water tight by a cap 23 which screw threads
 90 thereinto and which comes preferably flush with the top surface of the box, as shown in
 Figs. 2 and 3. The passageway 19 is shown
 in Fig. 3 as being curved, so as to open
 through the side of the body. I have here-
 95 in shown the body as provided with the internally screw-threaded boss 24 communicat-
 ing with the passageway 19 and into which
 the end of the pipe 5 may be screwed. The
 body 17 is preferably provided on each side
 with the lugs or projections 25 which have
 100 flat upper faces and are preferably situated a distance below the top of the box equal
 to the thickness of a brick. The box 6 is
 also preferably square and of the width of
 a brick so that when it is placed in a side-
 105 walk and the bricks are laid so as to rest on the lugs 25, the top face of the box will
 come just flush with the surface of the side-
 walk. It is possible, therefore, to place this
 box in the sidewalk and yet have the bricks
 110 fit it closely so that it will not form any objectionable feature in the sidewalk. In Fig.
 2 I have shown the bricks in dotted lines, and said figure shows the relative position
 of the bricks to the box. With this con-
 115 struction the bricks will always be kept level with the top of the filling box, for if the
 heaving of the ground due to the frost tends to raise the box, the lugs 25 will carry the
 bricks up with the box so as to maintain
 the box and bricks always level. The top
 120 of the filling box will also preferably be formed on a slight incline so as to conform to the inclination or slant of the sidewalk,
 and the boss 24 will preferably be slanted
 125 slightly in the opposite direction to conform with the inclination of the pipe 5.

The box 6 is herein shown as provided
 with one or more drip openings 26 which
 lead into the chamber 18 and which form
 a means for draining said chamber if gaso-
 130

lene or water should enter the same. The cap 23 is provided with two apertures 27 to receive a suitable implement, such as a spanner wrench, by which it may be removed, and the cap 21 is shown as provided with notches 28 on its periphery which are adapted to receive this same implement so that the latter may be used for removing both of the caps. This construction makes it impossible to remove the caps without having the proper-shaped tool and thus constitutes a safe-guard against having the box tampered with by unauthorized persons. When the tank 4 is to be filled, the caps 23 and 21 are removed and then a suitably-shaped funnel may be screwed onto the nipple 20, into which funnel the gasoline is discharged, or the tank wagon or other source of gasoline supply may be connected directly to the nipple 20 by means of a hose. This form of filling box is not herein claimed as it is made the subject of a divisional application, Ser. No. 722,613, filed September 27, 1912.

The gage pipe is shown at 29 and it is entirely separate from the filling pipe 5, it being connected to a boiler flange as above described and extending substantially to the bottom of the tank. At the upper end it is secured to a connection 6^a similar in all respects to the filling box 6, and which is preferably located in the floor of the garage, except that the connection 6^a has the passage-way 19 extending vertically through the same instead of opening through the side. This gage pipe 29 provides means whereby a gage rod may be inserted into the tank at any time whether the tank is being filled or not. Since the gage pipe 10 extends to the bottom of the tank 4, it will be sealed at the bottom, and, therefore, no gasoline fumes will escape when the cap of the connection 6^a is removed.

I propose to make the gage pipe 29 of sufficient size so as to permit a person to take a correct measurement by means of any ordinary gage stick.

The suction pipe is shown at 30 and it is also connected to the tank by means of a separate boiler flange and extends to the bottom of the tank, it being provided on its lower end with a suitable foot valve 31. This pipe 30 extends up into the garage at some suitable point and the upper end is adapted to have a pipe of a suction pump secured thereto in usual fashion. This upper end is normally closed by a suitable cap 32.

33 designates a vent pipe which is separate from the other pipes and connects into the tank at the top thereof and which leads to any suitable point above surrounding buildings, as shown in Fig. 1, the upper end being preferably provided with a guard 34 which may be of substantially the same construction as the splash preventer 11 ex-

cept that it is inverted in position from that in which the splash preventer is used. A device of this sort prevents the entrance of rain or snow into the pipe while allowing gasoline fumes to escape. I will preferably place a fire arrester 71 in the pipe 33 directly above the tank to prevent danger of fire entering the tank through said pipe 33.

With my improved system it will be observed that the tank can be filled at any time without causing the gasoline to be dashed against the bottom of the tank and thus generating a large quantity of gasoline fumes and furthermore the lower end of the filling pipe is sealed at all times so that even when the tank is empty there will be no escape of gasoline fumes when the caps are removed from the filling box 6. It will also be seen that by employing a separate gage tube 29 it is possible to gage the depth of the liquid in the tank at any time whether the tank is being filled or whether it is being emptied. Furthermore my system is provided with such safe-guards that even if a fire should occur in the garage or building 3 and the various pipes leading to the tank should become broken, there is very slight danger of an explosion.

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

1. The combination with a storage tank for liquids, of a filling pipe entering said tank and extending to the bottom thereof, and a combined splash preventer and seal attached to the lower end of said pipe and having an upwardly-directed discharge passage of greater area than the cross-sectional area of said pipe and situated above the bottom of the seal whereby a quantity of liquid will always remain in the seal to seal the filling pipe regardless of the level of the liquid in the tank.

2. In a system for storing liquids, the combination with a storage tank, of a filling pipe entering said tank and extending to the bottom thereof, means on the lower end of said pipe to seal it at all times against the passage of gas therethrough and to prevent splashing of the liquid delivered thereto against the bottom of the tank, said means comprising a bowl-shaped member into which the filling pipe discharges centrally and which has an annular discharge opening exterior to and encircling said pipe whereby the liquid is discharged from said bowl-shaped member on all sides thereof.

3. The combination with a storage tank for liquids, of a filling pipe entering said tank and extending to the bottom thereof, and a combined splash preventer and seal attached to the lower end of the pipe and having a liquid-deflecting surface to deflect upwardly the liquid discharged from the filling pipe and also having an outlet pas-

sage at the upper end of said deflecting surface which has a greater cross-sectional area than that of the pipe.

4. In a system for storing liquids, the combination with a storage tank, of a filling pipe entering said tank and extending to the bottom thereof, and a splash-preventing seal on the lower end of said pipe, said seal comprising a bowl-shaped member into which the pipe discharges and which has a

discharge passage above the bottom thereof of greater area than that of the pipe.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES L. FRENCH.

Witnesses:

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THOMAS J. DRUMMOND.