

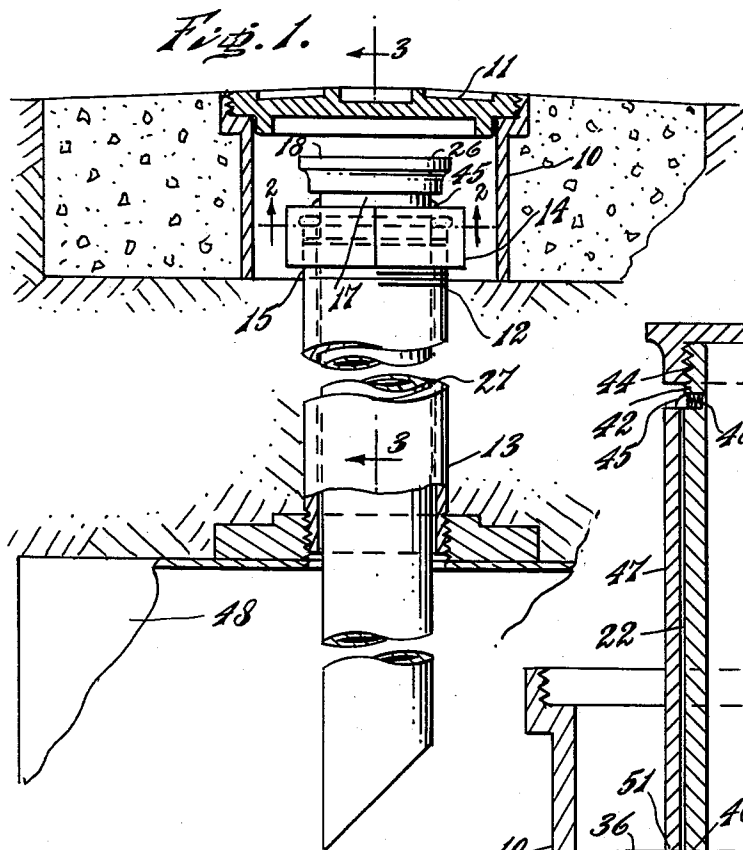
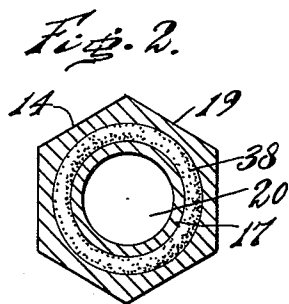
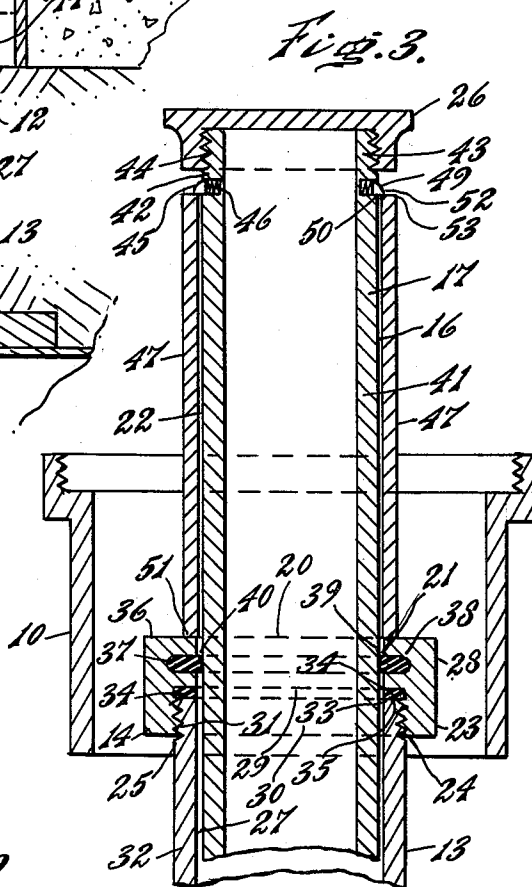
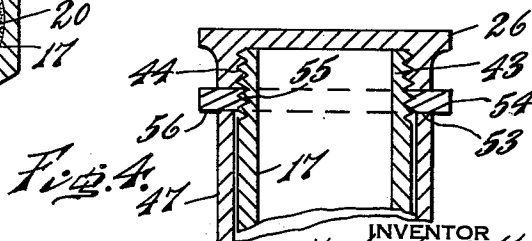
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GASOLINE TANK FILL

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GASOLINE TANK FILL

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This invention relates in general to tank fill arrangements and more particularly to a fill designed and arranged to prevent the entry of ground water and other foreign substances into an underground tank during the filling operation.

At the present time, most gasoline, fuel oil and other flammable liquid storage tanks are installed outside of buildings and below ground both in the interest of safety and in the conservation of space usable for other purposes. Storage in this manner has proven quite satisfactory from the overall standpoint, but certain operating difficulties have arisen. Experience has shown that water often accumulates in underground storage tanks thus contaminating the product therein contained. Such contamination is troublesome and costly inasmuch as water can cause stoppages in the engines or other equipment being operated by means of the flammable liquids contained in the tank. Further, accumulation of water inside of tanks can cause corrosion of the tank shell thereby materially decreasing the useful life of the tank. Prior workers in this field have endeavored to solve this problem in a number of ways, but all with only limited success. A number of years ago, the standard fill box was introduced and its use has become more or less uniform in the industry. However, the fill box does not entirely prevent the entrance of water into the fill pipe during the filling operation inasmuch as often-times the fill box itself becomes full of water which can eventually find its way into the tank. Another worker has introduced a rubberized gasket designed to provide a raised curb around the fill box in order to prevent ground water from entering the fill box. This too has proved unsatisfactory inasmuch the gasket cannot prevent water from entering the fill box prior to being placed in position, and further, experience has shown that the surface about the top fill boxes is often covered with oil or grease thereby preventing an adequate seal between the gasket and the surface thus allowing water to run into the fill box through the break in the seal. Recent improvements incorporating tight fill connections have also proven unsatisfactory so far as preventing the entrance of water is concerned.

It is therefore an object of this invention to provide a device to prevent water from entering buried flammable liquid tanks.

Another object of this invention is to provide a water excluding tank-fill arrangement designed to operate with existing underground equipment.

Another object of this invention is to provide an underground tank fill connecting with existing equipment without alteration.

Another object of this invention is to provide a water excluding underground tank fill that will entirely fit within existing fill box.

Another object of this invention is to provide a device that will extend underground tank fills above grade.

Another object of this invention is to provide an underground tank fill arrangement incorporating telescoping, concentric pipe means.

Another object of this invention is to provide a device that is rugged in construction, relatively simple in operation and inexpensive in manufacture.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing wherein like reference characters refer to similar parts throughout the several views and in which:

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FIGURE 1 is a side elevation view, partly in cross section.

FIGURE 2 is a cross section taken along line 2-2 of FIGURE 1.

FIGURE 3 is a cross section taken along line 3-3 of FIGURE 1.

FIGURE 4 is a cross section showing alternate construction of top portion of FIGURE 3.

Although specific terms are used in the following description for the sake of clarity, these terms are intended to refer only to the particular structure selected for illustration in the drawings and are not intended to define or limit the scope of the invention.

In FIGURE 1, I show a conventional fill box 10 with screwed cover plate 11 housing upper terminus 12 of tank fill 13 in the usual manner. Stationary coupling 14 joins screwed connection 15 with upper terminus 12 of fill pipe 13 provides a slideable engagement 16 with fill pipe extension piece 17 shown in lowest position 18 disposed below cover plate 11 and fitting entirely therein.

Coupling 14 is preferably of hexagonal outer configuration 19 to permit easy installation using conventional tools and is constructed of steel or other suitable material. A first longitudinal bore 20 having its diameter 21 slightly larger than outer diameter 22 of extension piece 17 and equal to inner diameter 27 of fill pipe 13 extends through the upper portion 28 of coupling 14 to a point at approximately the middle 29 of the coupling. The lower portion 23 of coupling 14 is drilled with a second longitudinal bore 30 of diameter 31 slightly smaller than outside diameter 32 of fill pipe 13 and terminates in a shoulder 33 near mid-point 29. Both longitudinal bores 20, 30 are concentric and immediately adjoining forming a continuous cylindrical opening of two diameters.

In the lower portion 23 of the coupling 14, the longitudinal bore is tapped with an internal screw thread 24 of standard size to engage existing external screw threads 25 of fill pipe 13 which external thread is presently used for screw engagement of fill cap 26. Sufficient threads are provided to form a sturdy connection 15 with fill pipe 13 and I provide a circumferential ring gasket 34 preferably of rubber or neoprene to fit between top of fill pipe 35 and shoulder 33. In installation, the coupling 14 is drawn up tight upon threads of fill pipe 13 to tightly compress gasket 34 between shoulder 33 and top of fill pipe 35, thereby creating a liquid tight joint to prevent ground water from entering fill pipe 13 through screwed connection 15.

In the upper portion 28 of coupling 14, approximately midway between shoulder 33 and top of coupling 36, I provide a recessed, circumferential groove 37 to form a secure seat for extension piece ring gasket 38 which is a press fit therein. Said gasket may be constructed of rubber, neoprene or other suitable water excluding material and should be of width and outer diameter sufficient to seat tightly within recessed groove 37 and of inner diameter 39 to extend inward from first longitudinal bore a sufficient distance to firmly seat upon outside 22 of fill pipe extension piece 17 and form a seal 40 against the entrance of ground water.

It is my intention to provide a device that will operate with existing equipment with a minimum of alteration or excavation. Inasmuch as existing fill pipes may be found in many sizes, the majority varying between two inches and four inches, I have found it desirable to manufacture the coupling 14 and consequently the extension piece 17 in several sizes to cooperate with existing equipment in place. As can be readily seen, it is not the size that is of prime importance, but rather fluid tight joints and proper arrangement of parts.

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Extension piece 17 is arranged to fit within tank fill 13 and is constructed of conventional galvanized steel pipe or galvanized steel or aluminum tubing. The extension piece is of sufficient length 41 to fit entirely within fill pipe 13 when in lower position 18 and to extend above surface water level (not shown) when in higher position 42 without pulling past sealing gasket 38 in coupling 14. If desired, a conventional stop arrangement may be incorporated in fill pipe extension piece to prevent accidental pulling of extension piece 17 out of fill pipe 13. The outside diameter 22 of extension piece 17 should be carefully chosen to form a slideable engagement 16 with coupling 14 and at the same time form a perfect water seal 40 with ring gasket 38. The upper end 43 of extension piece 17 is provided with external threads 44 in any conventional manner to receive fill cap 26 to form a tight closure.

I have found it desirable to provide one or more spring operated catches 45 in recessed openings 46 of extension piece 17 below the threads 44 to cooperate with standpipe support 47. Said catches 45 further serve as a stop to prevent the extension piece 17 from accidentally falling into the tank 48 through fill pipe 13. Said catches are designed with arced upper surface 49 and straight under surface 50 extending perpendicular away from surface of extension piece 17. The standpipe support 47 is constructed of a short length of galvanized steel pipe approximately eight to ten inches in length and of size to fit closely over extension piece 17. The standpipe support 47 is introduced over extension piece 17 when in higher position 42 until bottom 51 rests upon top of coupling 36. Catches 45 retreat into recessed openings 46 until the entire length of standpipe passes and return to extended position 52 upon urging of the spring action. Under surface 50 of catch 45 then rests upon top 53 of standpipe support 47 thereby securing the extension piece 47 in higher position 42 during the filling operation.

As an alternate method of construction, I show another embodiment of my invention in FIGURE 4. A metal annular ring 54 having internal threads 55 is provided in lieu of spring clips 45 in recessed openings 46. The annular ring 54 is constructed of such internal diameter as required to have threads 55 mate with external threads 44 of extension piece 17 and of such width as to permit screw connection of fill cap 26 when ring is in position. The annular ring 54 may be used when extension piece is either in lower position 18 or raised position 42 and serves the same purpose as spring clips 45. To use in lower position 18, remove cap 26 and screw ring down on extension piece external threads 44 until sufficient threads 44 are exposed to permit replacement of fill cap 26. Extension piece may then be lowered until bottom 56 of ring 54 touches top of coupling 36 thereby preventing further downward travel. To use in raised position 42, remove fill pipe cap 26 and insert standpipe support 47 over extension piece 17 until bottom of support 51 touches top of coupling 36. Next screw ring 54 down on external threads 44 of extension piece 17 until sufficient threads are exposed to permit replacement of fill cap 26 if so desired. Extension piece 17 may then be lowered until bottom of ring 56 touches top of standpipe support 53 thereby preventing further downward travel and locking extension piece above ground water level.

In order to use my invention, it is necessary to first remove the cover plate 11 and the fill cap 26 and to securely fasten coupling 14 to fill pipe 13 making a water-tight connection by inserting gasket 34 between shoulder 33 of coupling and top of fill pipe 35. Extension piece 17 is next inserted into fill pipe 13 in slideable engagement 16 with ring gasket 38 pressed into groove 37 of coupling 14 and forming a water seal 40 therewith. Fill cap 26 is screwed onto threads 44 at upper end 43 of extension piece 17 in the usual manner, the extension

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piece is depressed to lowest position and the cover plate is replaced. To operate, remove cover plate 11, grasp fill cap 26 and pull extension piece 17 to higher position 42. Remove fill cap and urge standpipe support 47 over catches 45 until under surface 50 of catch extends above top 53 of standpipe support 47 and bottom 51 of standpipe support contacts top of coupling 36 thereby locking extension piece in higher position 42 during the filling operation.

Although I have described my invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. An underground tank fill consisting of a fill pipe and fill box, a gasketed coupling connected therewith and a telescoping extension piece having upper and lower ends and extending within coupling, said fill pipe having an inside diameter and an outside diameter and extending from underground tank to within fill box mounted at ground surface and said fill pipe terminating in a standard external screw thread; said coupling consisting of an upper portion and a lower portion, the upper portion drilled with a first vertical, longitudinal bore equal in diameter to inside diameter of fill pipe and the upper portion being provided with an internal recessed, circumferential groove communicating with said first longitudinal bore, said lower portion drilled with a second vertical, longitudinal bore slightly smaller than outside diameter of fill pipe, both bores being concentric and immediately adjoining forming a continuous cylindrical opening of two diameters, said second longitudinal bore tapped with an internal screw thread cooperating with and connected to said external screw thread of fill pipe, said coupling having an internal shoulder at junction of said two longitudinal bores; a water-tight gasket between said shoulder of coupling and top of fill pipe arranged to seal connection between threads of coupling and threads of fill pipe; a water-tight ring gasket seated firmly within said recessed, circumferential groove, said ring gasket having internal diameter less than diameter of first longitudinal bore and smaller than outside diameter of extension piece; the telescoping extension piece constructed of pipes or tubing of external diameter of such size to permit insertion of lower end within fill pipe and in slideable engagement therewith, said extension piece forming a water-tight seal with ring gasket secured in coupling and terminating at the upper end in an external screw thread, said extension piece fitting entirely within fill pipe and fill box in lowest position and extending above fill pipe and fill box in raised position; and a screwed fill cap connected with external threads at upper end of extension piece whereby a ground water excluding tank fill is provided.

2. An underground tank fill in accordance with claim number 1 wherein locking means are provided to prevent extension piece from slipping entirely into fill pipe.

3. An underground tank fill in accordance with claim number 1 wherein locking means comprising spring clips mounted below top external threads are provided in extension piece and extend radially outward therefrom to prevent extension piece from slipping entirely into fill pipe.

4. An underground tank fill in accordance with claim number 1 wherein spring clips having straight under surfaces and extending perpendicularly from outer surface of extension piece are provided to prevent extension piece from slipping entirely into fill pipe.

5. An underground tank fill in accordance with claim number 1 wherein standpipe means are provided to lock extension piece above top of fill box in raised position.

6. An underground tank fill in accordance with claim

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number 1 wherein standpipe means including a hollow cylindrical support of length sufficient to hold extension piece above fill box having top and bottom said support fitting over extension piece and spring clip stops held in recessed openings near top of extension piece, said stops securing top of extension piece above top of support while bottom of support rests upon said coupling are provided to lock extension piece above fill box in raised position.

7. An underground tank fill in accordance with claim number 1 wherein locking means comprising an internally threaded annular ring screwed upon said external threads cut at top of extension piece are provided to prevent extension piece from slipping entirely into fill pipe.

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