Dec. 23, 1924. 1,520,230

O. S. FLATH

STORAGE TANK

Filed Sept. 19, 1921

Fig. 1.

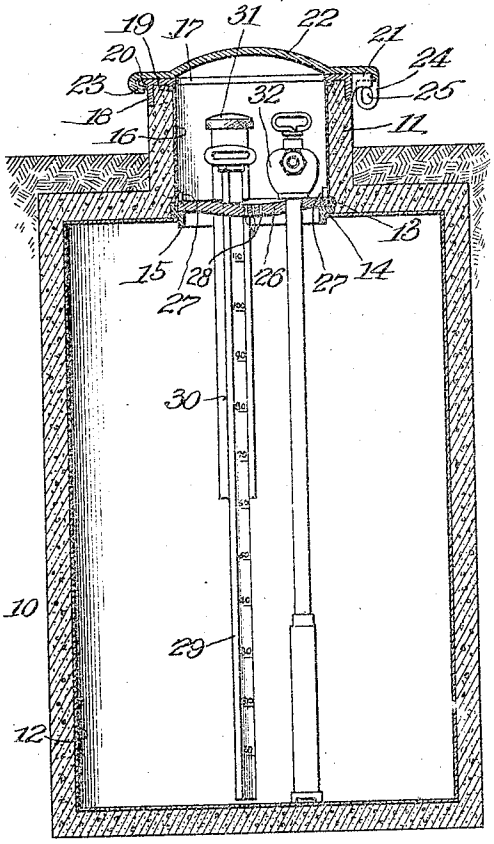


Fig. 2.

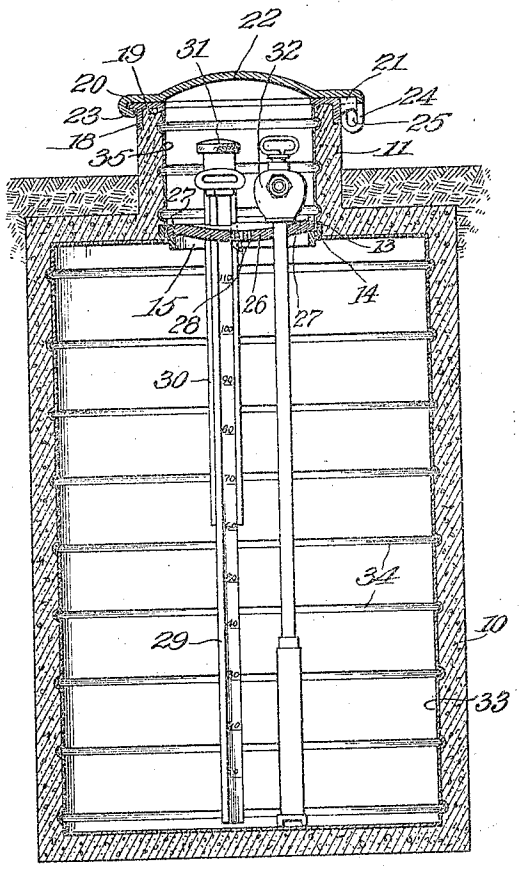
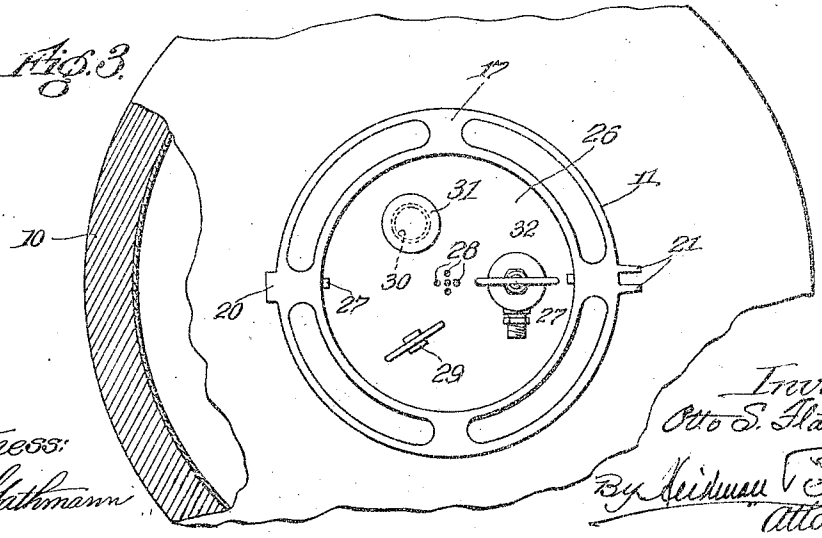


Fig. 3.



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UNITED STATES PATENT OFFICE.

OTTO S. FLATH, OF CHICAGO, ILLINOIS.

STORAGE TANK.

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To all whom it may concern:

Be it known that I, OTTO S. FLATH, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Storage Tanks, of which the following is a description, reference being had to the accompanying drawing, which forms a part of my specification.

My invention relates more particularly to storage tanks for oil comprising a molded monolithic structure of hydraulically setting or cementitious material which is adapted to be sunken or buried in the ground, with the exception of the necked orifice; and the invention has for its object the provision of a structure or tank provided with an inner lining or casing impervious to oil; while the inner end of the neck of the tank is intended to be provided with an inner top or closure member which is provided with a filling tube or orifice; to hold or properly support a suitable pump, whereby the oil may be forced from or pumped out of the tank; and which inner top or closure member is also provided with a gauge or measuring element whereby to determine the amount of oil or liquid within the tank.

The objects and advantages of my invention will all be more readily comprehended from the detailed description of the drawing, wherein:—

Figure 1 is a vertical sectional view of one form of my improved tank.

Figure 2 is a similar view illustrating a modified form.

Figure 3 is a partial top plan and sectional view with the outer cover or closure member removed.

My improved tank comprises an outer wall or shell 10 of suitable hydraulically setting or cementitious material, such as cement and an aggregate, molded to form a monolithic structure comprising a bottom and cylindrical sides having a top portion which terminates in the upwardly disposed neck or dome 11 which is adapted to extend above the surface of the ground while the main portion of the tank is buried or located in the ground as illustrated in the drawing; the shouldered top permitting the soil to be placed thereon and thus overcome the tendency of the tank to work its way upward.

The cementitious structure is provided with an inner wall or shell 12 of sheet metal, or other suitable material impervious to oil; the inner shell being preferably continuous throughout the bottom and side walls as well as the top of the tank about the neck or dome thereof. During the molding of the monolithic structure (which is molded about the inner shell or tank 12) the inner shell or tank 12 is provided at the top about the orifice therein, with a metallic ring or flanged band 13, preferably of the Z-shape configuration in cross section, placed so as to have one flange disposed downwardly within the orifice of the inner shell or wall 12, while the other flange or portion is disposed upwardly and adapted to be embedded in the hydraulically setting or cementitious material, as shown at 14 in Figure 1. In this manner the annular band or ring 13 is not only securely held in place, but the downwardly disposed flange or portion 15 will firmly hold the inner shell or wall and reenforce the upper orificed portion thereof; while the intermediate horizontally disposed portion will provide a suitable shoulder and support for the metallic shell or impervious lining 16 constituting the inner wall for the neck 11 of the tank.

The upper end of the neck 11 is provided with a metallic ring 17, the lower side whereof is provided with downwardly extending flanges 18 and 19 disposed adjacent the outer and inner perimeters, respectively, of the ring and these flanges are preferably embedded or partially so, in the cementitious material or outer casing 10. The inner flange 19 is slightly removed from the inner perimeter of the ring 17 so as to leave a space or shoulder of width commensurate with the thickness of the metallic band or shell 16 in the neck of the tank. With the overlapping portion at the inner perimeter of the ring 17 and the horizontally disposed shoulder of the ring 13, it is apparent that the lining or shell 16 will be firmly held in place against any displacement. The ring 17 may be of the skeleton formation, more clearly shown in Figure 3 and is provided with the laterally disposed lip or lug 20 at a diametrically opposite point with a pair of spaced lugs or lobes 21. This ring 17 is adapted to receive a suitable lid or cover 22, preferably of metal, provided at one side with the downwardly and inwardly bent portion 23 which is adapted to engage beneath the lip or lug 20; while the lid or cover 22 at a diametrically op-

posite point is provided with a downwardly disposed lobe 24 adapted to extend between the spaced lugs 21. The downwardly disposed lobe 24 is apertured as shown at 25 to receive a suitable lock. With this construction, it is evident that when the portion 23 is fitted over the horizontally disposed lug 20 of the ring 17 and a suitable lock passed through the aperture 25 of the lobe 24, that the cover or lid 22 will be firmly locked in place and access to the tank made impossible, as the lobes 21 with lobe 24 fitting therebetween will prevent rotation of the cover.

The inner lower end of the neck 11 is provided with a plate or cap 26, preferably of metal, which rests on the horizontally disposed shoulder provided by the ring 13; the plate providing an inner closure or cap which will prevent material or foreign matter falling into the tank when the outer closure member or cap 22 is removed. The inner cap or plate 26 is provided with an aperture for the reception of a suitable gauge or measuring stick 29 which is inserted through the aperture in the plate or inner cap 26 and is of length sufficient to extend from the bottom of the tank to a point slightly above the inner closure member or cap 26; the measuring stick 29 (which may be of comparatively thin sheet metal) being provided with suitable graduations commensurate with the capacity of the tank, whereby to indicate the number of gallons of oil, or other suitable liquid within the tank. In order to determine the quantity in the tank, it is, of course, necessary to withdraw the gauge 29 so as to determine the height of the liquid and its stage relative to the graduations.

The inner closure member or cap 26 is also provided with a short pipe or tube 30 which may be screwed into a tapped opening in the cap 26, while the upper end is preferably threaded to receive a screw-cap as at 31; the tube 30 constituting a filling tube for the tank through which the oil is introduced.

The inner cap or plate 26 is provided with a third aperture to receive a suitable hand pump 32 adapted to take the oil from the bottom of the tank; as the pump, which is provided with a threaded nipple to receive a hose-connection, is of the usual well known construction, detailed description thereof need not be here entered into. The three apertures in the inner closure member or cap 26 are preferably disposed in the triangulated manner at equi-distances apart, as more clearly shown in Figure 3, and the plate 26 is shown provided with small air-admitting openings or ports as shown at 28.

In Figure 2 I show a modified form of my improved tank, wherein the inner shell or wall 33 is provided with circumferentially disposed corrugations as at 34, intermediate of the bottom and the top of the main portion of the tank; while the inner shell or lining 35 of the neck 11 of the tank is also preferably circumferentially corrugated, thereby providing what may be termed a self-supporting form for the concrete exterior while at the same time reenforcing the tank throughout its height. The corrugations of both portions of the inner shell or lining are preferably outwardly disposed so as to permit them to become embedded in the hydraulically setting or cementitious material as clearly shown in Figure 2. As the other features of the tank are identical with these shown in Figures 1 and 3 and as previously described, further description of such features or portions need not again be entered into.

In both constructions, the cap or plate 26, at diametrically opposite points, is provided with notches for the passage of lugs 27, 27 formed on or secured to the inner lining 16 or 35, as the case may be, so that a partial rotation of the cap or plate after passing below the lugs, will prevent accidental lifting of said cap or plate 26, thus maintaining the latter in place; while removal of the plate 26 may readily be accomplished when the notches are brought to register with the lugs 27, 27.

The constructions disclose an integral unit or inner cap for securing the gauge, pump and filling tube and maintaining the same in the neck of the tank in easy accessible position; at the same time enabling all of said elements to be removed or withdrawn from the tank upon the removal of the inner plate or cap 26.

I have described what I believe to be the simplest forms of my invention in terms employed merely for description and not employed as terms of limitation, as structural modifications are possible and may be made without, however, departing from the spirit of my invention.

What I claim is:—

1. A tank of the character described, comprising an outer monolithic shell or casing composed of hydraulically setting or cementitious material and formed with a necked orifice in the top thereof, an inner wall or shell composed of material impervious to oil made continuous throughout the interior of the tank, a metallic shell disposed in the neck of the tank, the inner orifice of the neck being provided with a metallic ring having upwardly and downwardly disposed flange portions, the upwardly disposed flange portion being embedded in said outer shell while the downwardly disposed flange portion provides abutment for the inner shell of the main portion of the tank, a cap or plate adapted to seat on said ring at the inner orifice of the neck, said inner cap or plate being provided with a filling aperture,

a pump-receiving aperture and a gauge or measuring stick receiving aperture, the shell of the neck of the tank and said cap or plate being provided with lugs and notches, respectively, adapted to register with each other, whereby the cap or plate may be locked in place, a flanged ring disposed about the outer orifice of the neck with the flanges of said ring disposed downwardly and embedded in the outer shell or wall, said ring on the outer perimeter being provided at diametrically opposite points with laterally disposed lugs, and a closure member or cap having portions correlated to the laterally disposed lugs of the last mentioned ring whereby said last mentioned cap is secured in place.

2. In a tank of the character described, an inner thin sheet metal shell or fluid-holding wall provided with an opening in the top thereof, an outer wall of hydraulically setting or cementitious material provided with a necked orifice in the top, an oppositely flanged ring mounted on said inner shell or wall with one of the flanges disposed downwardly through the opening in said inner shell or wall to reenforce the top of said inner shell or wall while the other flange is disposed upwardly and embedded in the outer wall of cementitious material, and a flanged ring disposed on the neck of said outer wall, the flanges being offset from the periphery of the ring and embedded in the cementitious material of said outer wall while the outer periphery of said ring is disposed beyond the sides of the neck of said outer wall to provide a projecting cover attaching portion.

3. In a tank of the character described, an inner sheet metal shell or fluid-holding wall formed with outwardly disposed corrugations or ribs and with an opening in the top thereof, an outer wall of hydraulically setting or cementitious material in which said outwardly disposed corrugations or ribs of the inner shell or wall are embedded, a metallic ring arranged on said inner shell or wall, the inner perimeter of said ring being provided with a downwardly disposed flange adapted to extend through the opening in the top of the inner shell or wall to reenforce the latter, while the outer perimeter of said ring is provided with an upwardly disposed flange adapted to be embedded in the cementitious material of the outer wall, a second metallic ring disposed on the neck of the outer wall and provided with a downwardly projecting portion adapted to be embedded in the cementitious material of said outer wall, and a continuous metallic shell arranged in the neck of said outer wall and supported by said first mentioned metallic ring.

4. In a tank of the character described, an inner sheet metal shell, an outer wall of hydraulic setting material, said outer wall being provided with a dome or neck formed at its juncture with the body to provide a support or ledge, an inner member or cap seatable on said support or ledge at the juncture between the dome and the body of the tank and removable to the outer orifice of the dome or neck, said member or cap constituting a closure and a filling tube, measuring gage and pump holding unit, and means whereby said member is removably secured in place.

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Witnesses:
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