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R. H. F. SEWALL.

OIL RESERVOIR OR TANK.

APPLICATION FILED OCT. 21, 1902.

NO MODEL.

Fig. 1.

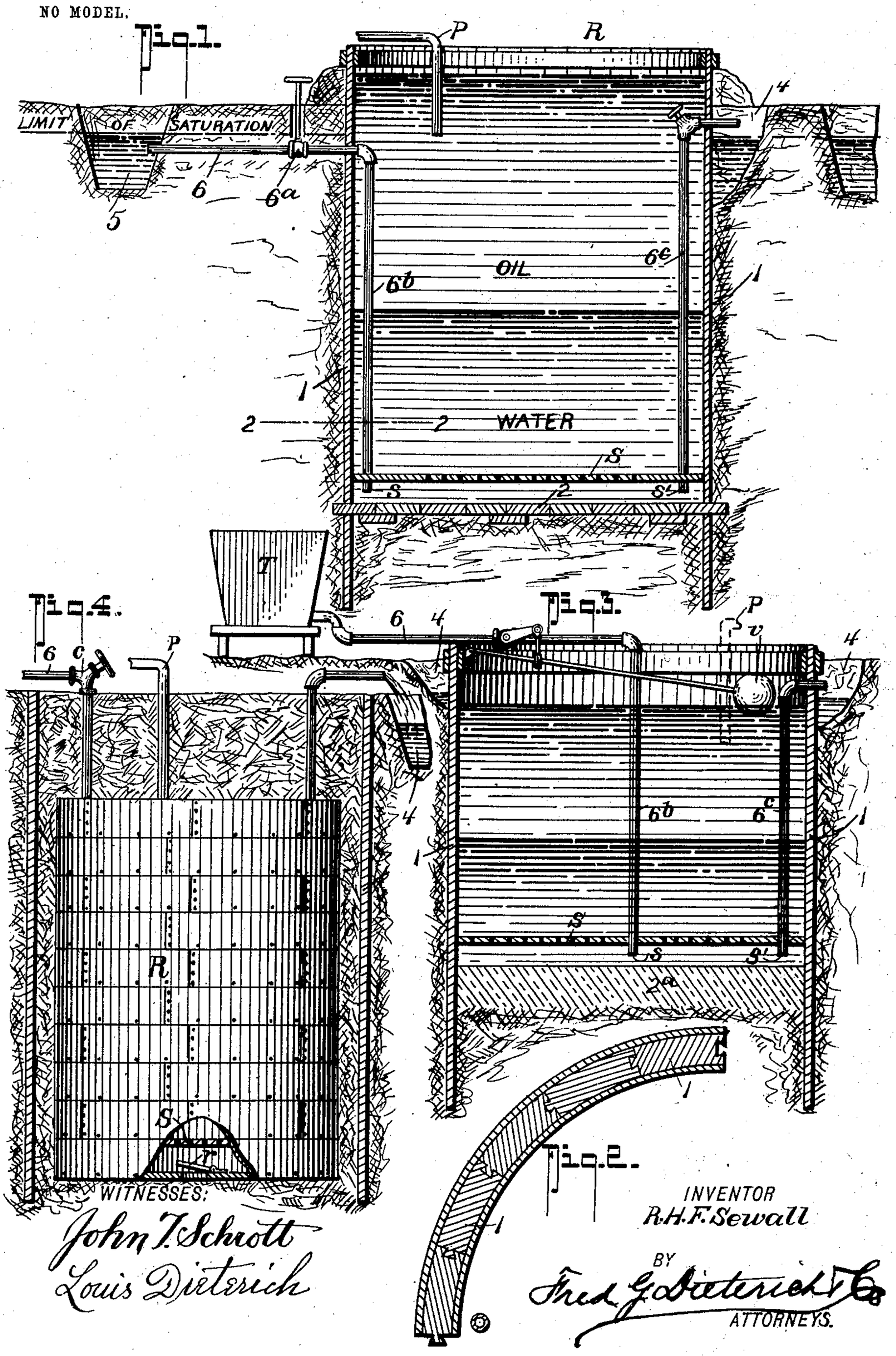

Fig. 4.

Fig. 3.

Fig. 2.

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UNITED STATES PATENT OFFICE.

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OIL RESERVOIR OR TANK.

SPECIFICATION forming part of Letters Patent No. 744,694, dated November 17, 1903.

Application filed October 21, 1902. Serial No. 128,164. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. F. SEWALL, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and Improved Oil Reservoir or Tank, of which the following is a specification.

My invention seeks to provide an improved type of oil reservoir or tank especially designed for use in saturated soil in which the water rises to near the surface or at such points where artificial water-supply is readily had; and in its generic sense my invention comprehends an improved form of oil-holder made impervious to oil utilized with natural or artificial means for constantly water-soaking the holder and which includes means whereby to maintain at all times a permanent and level drawing-off surface for the oil, whether the reservoir be of timber or of iron, as usually constructed.

In its more subordinate features my invention consists in the peculiar combination and novel arrangement of parts, all of which will hereinafter be fully explained, and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section illustrating the generic idea of my invention and showing the preferred construction thereof. Fig. 2 is a detail section of the same on the line 2 2 of Fig. 1. Fig. 3 is a vertical section illustrating the modified arrangement of my invention, showing the same when completed for use in soil where the natural saturation does not extend up to nearly the earth's surface. Fig. 4 is a view of the modified arrangement of my invention, hereinafter referred to.

In carrying out my invention of the construction of the preferred form thereof I build the reservoir R at such a point as desired by driving dovetailed piling (indicated by 1 1) to the necessary depth and in a circular path, the dovetailed portions forming close joints. The earth between the piling 1 1 is then dug out, which permits the earth on the exterior of the piling to press tightly against the arch of the circle—tangentially, as it were—thereby thoroughly tightening up the said dovetailed joints. In localities where the soil admits of puddling the bottom of the reservoir may be of earth; but I prefer to have the bottom of wooden planks, as indicated by 2, Fig. 1; but the said bottom in other instances may be of solid cement, as indicated by 2^a in Fig. 3. In very wet soil the reservoir R is kept thoroughly saturated at all times by the natural moisture of the earth; but in dry localities in order to maintain the necessary saturation of the reservoir a trench 4 is dug around the upper end of the reservoir to the required depth, as clearly indicated in Fig. 3, which is supplied from the waste-pipe to maintain the moisture on the outside of the tank. When the soil is water-soaked to a point near the surface, a ditch or canal 5 is dug adjacent the upper end of the reservoir, (see Fig. 1,) which ditch 5 collects water from the saturated earth, and the interior of the said reservoir is water-fed from the said ditch through the pipe 6, which has a controlling-valve 6^a and also a pendent portion 6^b, that extends down into the reservoir below the oil.

So far as described it will be apparent the highest point to which the tank can be filled with water is on the level with the line of saturation of the earth, and the reservoir or tank has its top arranged at a predetermined distance above the line of saturation, for a purpose presently to appear. The distance of the tank above the line of saturation of the earth is such that the oil will at all times be practically at the top level of the reservoir or tank and held there by the water bulk below it. When filling the reservoir or tank, the oil will force the water under it through a relief-pipe 6^c into the canal or ditch 4. When the oil is to be used up for fuel purposes, the water from the canal 5 flows into the reservoir under the oil, provided the valve 6^a is opened, and thereby maintains the oil at the upper end of the reservoir, it being understood that the specific gravity of the oil is such that the said oil can never be forced over the top of the reservoir, for the said reservoir-top is at a proper distance above the line of saturation of the earth. For example, assuming the ratio of specific gravity of oil and water as being nine-tenths and one, respectively, the oil being nine-tenths as heavy as water, then the top of the reservoir will be sufficiently above the

line of saturation of the earth as to permit the upper surface of the oil being held a distance equal to one-tenth the depth of the tank above the line of saturation of the earth. It should also be understood that the head of oil in refilling pushes out the water below it.

When the nature of the soil in which the reservoir is sunk is such that natural water-supply cannot be had, I provide a supplemental water-tank T, (see Fig. 3,) which is disposed in the plane above the reservoir R and from which extends a valved water-supply pipe 6 for letting water gravitate to the bottom of the reservoir R, and in this construction a relief-pipe 6^c is also provided, which has an outflow for discharging the excess of the water during the filling of the reservoir R with oil. Since the earth surrounding the reservoir when this form of my invention is used is dry unsaturated earth, the water discharged from the pipe 6^c into the ditch 4 is immediately absorbed by the dry earth, and hence will not return to the reservoir 1 through the pipe 6^c.

It is obvious that the water-level may be automatically governed by the variation of the oil held above it by means of an ordinary float-valve mechanism *v*, such as is commonly used for controlling the valve in the feed-pipe of ordinary flushing-tanks, whereby to cut off the water-supply when the oil rises and to turn on the water-supply as the oil is drawn off, it being clearly understood that the level of the oil is always maintained as much above that of the line of saturation of the earth as will cause the oil and water to maintain a balance-pressure. The height to which the oil rises above the line of saturation is proportional to the ratio of specific gravities of water and oil. In thus automatically controlling and regulating the supply the tendency of the reservoir to float up is prevented, and the necessity of anchoring the reservoir, concrete foundations, &c., which involve a great cost, are thereby avoided.

S designates a perforated plate located just above the lower ends of the pipes 6, 6^b, and 6^c, of the full internal diameter of the reservoir R, the purpose of which is to prevent the formation of a whirlpool at the bottom of the reservoir, which would draw the oil down to the lower end of the said pipes, though the water be considerably above the end of the pipe, and thereby discharging the oil with the water when refilling the reservoir or tank R. The portion of the plate S surrounding or near the pipe-apertures *s s'* is imperforated to cause a proper flow of water from the pipe 6^b and into the pipe 6^c.

While I prefer to use a relief-pipe 6^c, as the same may be readily used for pumping out the contents of the reservoir for cleaning the same, I desire it understood that the same pipe may be omitted and the water in tank or reservoir R exhausted through the pipe 6 into the canal 5 (see Fig. 1) by opening the valve 6^a, as the water will reverse its direction of flow when filling the tank with oil and run back into the canal 5, as stated.

In cities or other places where it is required that the reservoir or tank R be buried or covered by several feet of earth the water is supplied thereto in the manner shown in Fig. 4, and in this arrangement the reservoir or tank R will be kept full by the water-pressure through the pipe 6, it being understood that when filling the reservoir with oil the water-supply is shut off by the valve in pipe 6. In this form the top of the reservoir R is closed. To remove the water from the tank, it is only necessary to attach a pump (not shown) to the pipe P and pump out the oil through said pipe. Oil may also be admitted to the tank through the pipe P when desired. The oil when turned into the reservoir R in any well-known manner—say through the pipe P—from the tank-car by its pressure forces the water from the bottom of the reservoir R through the relief-pipe 6^c to the trench 4. In order to economize the water-supply, pipe 6 has a globe-valve, as shown, to regulate the supply and to prevent a continuous flow of water under the oil and out through the pipe 6. The reservoir R in the construction shown in Fig. 4 is also provided with a check-valve *r* in the bottom in order to prevent the reservoir floating up should the artificial water-supply run short while the tank is being emptied of oil and to permit the inflow of water from the saturated earth.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of my invention will be readily apparent to those skilled in the art to which it pertains.

My construction of reservoir can be put up more economically than the ordinary iron tank, and being covered on the outside by water and on the inside by water and oil the same cannot rot. Furthermore, the construction is such that whenever oil is needed for fuel purposes a simple and economical means is at hand for forcing water under the oil, so as to maintain at all times a level surface for the oil, and thereby guarantee an uninterrupted and even supply to the burners.

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

1. A means for storing oil, comprising a reservoir embedded in the earth, a water-supply including a pipe extended within the reservoir to near the bottom thereof, said supply being controlled by the oil-pressure in the reservoir; and a perforated plate the full diameter of the reservoir disposed at a point above the lower end of the said pipe as set forth.

2. An apparatus for the purposes described, comprising a holder sunk below the earth's surface, a water-feed consisting of a valved pipe extended to the bottom of the holder and a relief-pipe connected thereto for discharg-

ing the back pressure of water at predetermined times and a perforated plate disposed at a point above the lower end of the relief feed-pipes as set forth.

3. A means for storing oil, comprising a vessel embedded in the earth with its upper end near the surface, means for maintaining an equalized pressure inside and outside of the holder, said means including a water-feed for saturating the holder, and a water-supply for the holder controlled by the oil-pressure in the holder and a perforated plate within the vessel disposed in a plane parallel to and slightly above the bottom thereof, as set forth.

4. An apparatus for the purposes described, comprising a holder, a water-trench surrounding the upper end thereof at a predetermined point below the upper end, a water-feed pipe extended within the holder, and a relief-pipe extended into the lower end of the holder, with its upper end discharging at a point in line with the trench and a perforated plate held within the tank in a plane above the lower end of the water-feed pipe, substantially as shown and described.

5. An apparatus for the purposes described, comprising a holder, a water-trench surrounding the upper end thereof at a predetermined point below the upper end, a water-feed pipe extended within the holder, and a relief-pipe extended into the lower end of the holder, with its upper end discharging at a point in line with the trench, and a perforated plate in the holder at a point above the lower ends of the feed and relief pipe, all being arranged substantially as shown and for the purposes described.

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