(No Model.)

G. W. KING.

Tank for the Storage of Petroleum.

No. 234,291. Patented Nov. 9, 1880.

Fig 1.

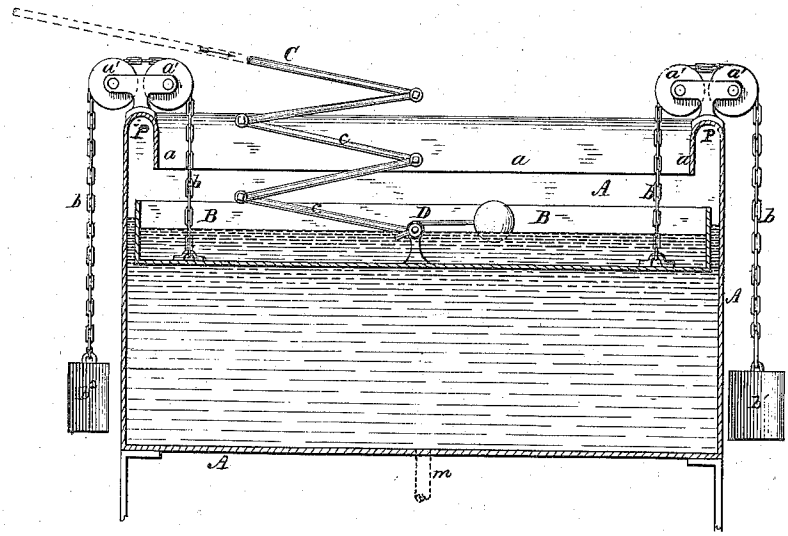
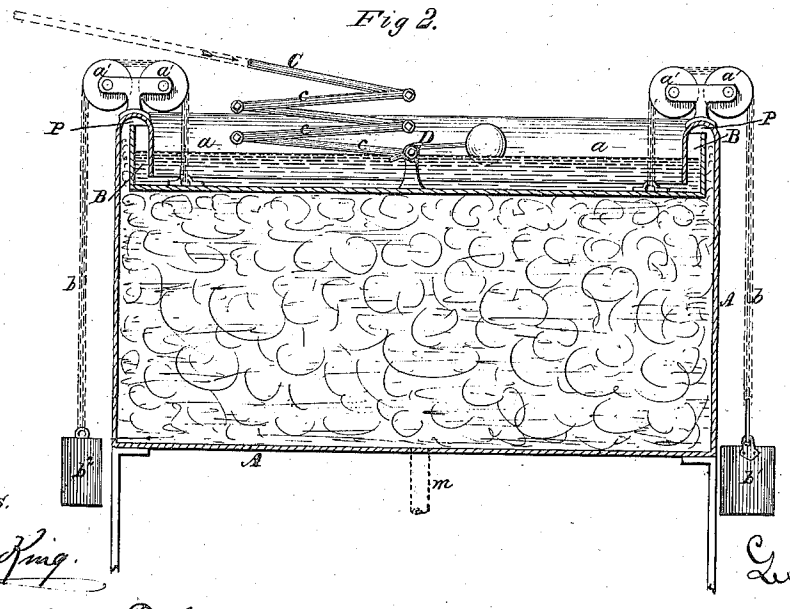


Fig 2.



Witnesses.

Harry King.

Edward R. Tyler.

Inventor.

Geo. W. King

UNITED STATES PATENT OFFICE.

GEORGE W. KING, OF GEORGETOWN, DISTRICT OF COLUMBIA, ASSIGNOR OF TWO-THIRDS TO WILLIAM W. STINCHCOMB AND JOHN J. LIGHTFOOT, OF SAME PLACE.

TANK FOR THE STORAGE OF PETROLEUM.

SPECIFICATION forming part of Letters Patent No. 234,291, dated November 9, 1880.

Application filed September 23, 1880. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. KING, a citizen of the United States, residing at Georgetown, in the District of Columbia, have invented certain new and useful Improvements in Tanks for the Storage of Petroleum; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to vessels for the storage of petroleum, and to devices for the protection of their contents from evaporation and from fire.

The objects of the invention are to diminish loss by evaporation and to guard against ignition and explosion, to which petroleum under storage is ordinarily subject, and to arrest the progress of fire if ignition should occur.

In this invention I aim at securing these objects by maintaining a constant exclusion of air from the greater part of the surface of the petroleum; also, by preventing the confinement in juxtaposition with the petroleum of collected gas or vapor generated by the petroleum; also, by providing an escape from the body of the petroleum of the gas and vapor so generated; also, by protecting the greater part of the surface of the petroleum from contact with gas and vapor floating in the atmosphere and subjecting it to a permanent cooling action, thereby diminishing evaporation from the petroleum and the generation from its surface of inflammable gaseous compounds; and, also, by providing for completely shutting off upon occasion the access of air to the petroleum, the provision being such that in case the petroleum catches fire the shut-off will be automatically set in operation by the ebullition of the petroleum.

The construction and operation of my invention are illustrated in the accompanying drawings, which consist of two figures, both presenting the same vertical section of a petroleum-tank supplied with my invention and having the pan in contact with the petroleum, Figure 1 representing the tank with the pan lowered, the seal not being established, and Fig. 2 representing the pan raised and the seal formed.

Similar letters refer to similar parts throughout both figures.

A is an ordinary tank for the storage of petroleum, open at the top, and having its sides conformed to the shape of the pan B, so as not to prevent the pan's moving up and down with the petroleum when afloat upon it.

B is a pan adapted to contain water and to float upon the surface of the petroleum in the tank, and provided with sides of even height. I construct the pan preferably of sheet metal and with a flat bottom. The depth of the pan which I recommend is eighteen inches, and I prefer to make the exterior diameter of the pan about two inches less than the interior diameter of the tank. No packing is used between the sides of the pan and the tank, but the space is left open to allow of the passage of vapor and to let the pan float free. The depth of the water in the pan I prefer to be two-thirds of the depth of the pan. It must, however, be sufficient in the part of the pan corresponding to the drooping flange *a* to allow of the submersion of the edge of the drooping flange when the pan is raised to its extreme height.

P is a continuous recess extending along the upper margin of the tank-walls, closed above and opened below, and having the margin of the drooping flange *a*, which forms it, horizontal.

In the drawings, the upper edge of the tank-wall is represented as having been turned inward and downward, constituting the drooping flange *a* and forming a rounded recess; but the recess may be constructed with straight sides, and the drooping flange, instead of being of one piece with the tank-wall, may consist of a strip of metal fastened to the wall, and may meet it at an angle.

The recess P is adapted to receive the side of the pan B within it, and the drooping flange *a* is adapted to pass at the same time beneath

the surface of the water in the pan, thus forming a water-trap joint or water-seal, as shown in Fig. 2.

The dimensions of the recess P which I prefer are a depth of eighteen inches and a width, for the most part, of twelve inches; but such width and depth only are necessary as will carry the drooping flange *a* inside the sides of the pan B and its edge within the water in the pan.

The water in the pan B being subject to loss by evaporation, I provide for its preservation at a constant quantity, employing an ordinary automatic ball-cock, D, supplied with an extensible pipe, C.

To facilitate the elevation at pleasure of the pan B and the adjustment of its balance, I supply the pan with an ordinary counterpoise formed of the chains *b b* passing over the pulleys *a' a'* and carrying the buckets *b' b'* or weights b^2 b^2, as shown. The buckets *b' b'* may be provided with supply-pipes connected with a distant reservoir and weighted, automatically or otherwise, with water, as occasion requires. Obviously the pan may be elevated by introducing water or oil directly into the tank through the oil-supply or other pipe, *m*, leading from a distance. These devices for the supply of water and the elevation of the pan, when constructed of material of proper character, contribute to safety in dangerous electrical conditions of the atmosphere.

Being supported by the petroleum, the pan requires no braces. By its close contact with the petroleum evaporation incidental to the access of air to the petroleum is precluded. Resting upon the petroleum, it interposes a shield between it and the inflammable gases and vapors floating in the atmosphere. Having its under surface shaped as described, it has no recesses in which explosive gases or vapors might collect between it and the petroleum upon which it rests; but they are allowed to pass without detention to the opening at the sides. The open space between its sides and the sides of the tank allows the egress of gases generated in the petroleum. The cooling effect produced by the evaporation of the water in the pan reduces the tendency of the petroleum to generate gas.

The formation of the water-seal, as described, may be accomplished by raising the pan B by means of the counterpoise-connection or the introduction of water or oil through the pipe *m*. These means may be resorted to to prevent ignition or to arrest the progress of fire.

When fire has already attacked the petroleum beneath the pan the principal reliance will be upon the automatic formation of the seal. Under the action of the fire the petroleum will expand and carry the pan upward until the water in the pan receives the edge of the flange *a* and the formation of the seal is accomplished. In Fig. 2 the seal is represented as formed and the pan as pressed upward by the petroleum, which is in a state of ebullition and expansion.

The water-seal acts not only to exclude the air, but as a safety-valve, yielding for the egress of vapor of sufficient tension and immediately recovering itself.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a petroleum-tank provided with the drooping flange *a*, the water-pan B, substantially as set forth.

2. In combination with the tank A, the pan B, the extensible pipe C, and ball-cock D, all substantially as and for the purpose described.

3. In combination with the tank A, the pan B and the chains *b b*, passing over the pulleys *a' a'* and supplied with weights, all substantially as and for the purposes described.

In testimony that I claim the foregoing as my own I hereunto affix my signature in presence of two witnesses.

GEO. W. KING.

Witnesses:

CHARLES WALTER,

EDWARD R. TYLER.