W. C. Allison,

Oil Tank.

No. 58,746. Patented Oct. 16, 1866.

Fig. 2.

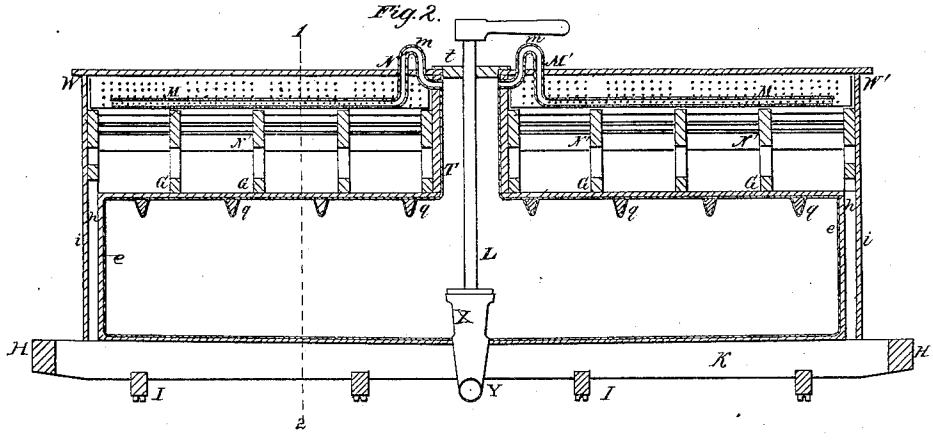


Fig. 3.

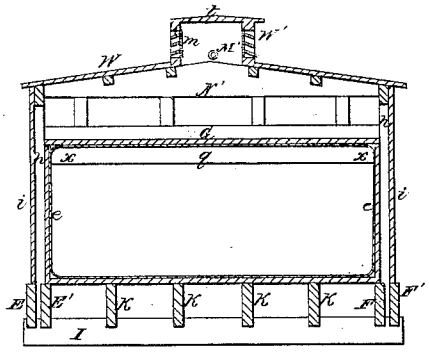


Fig. 5.

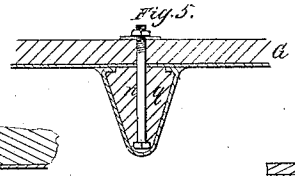


Fig. 4.

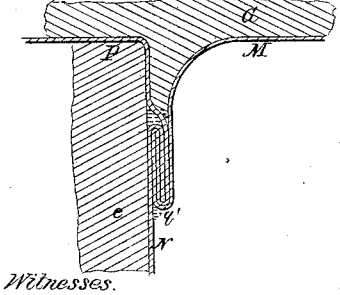
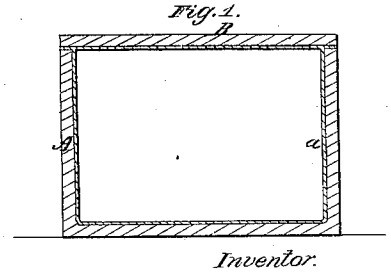


Fig. 1.



Witnesses.

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IMPROVEMENT IN TANKS FOR CONTAINING AND TRANSPORTING PETROLEUM.

Specification forming part of Letters Patent No. **58,746**, dated October 16, 1866.

To all whom it may concern:

Be it known that I, WILLIAM C. ALLISON, of Philadelphia, Pennsylvania, have invented certain Improvements in Tanks for Containing and Transporting Petroleum; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention consists of certain improvements, fully described hereinafter, in tanks or reservoirs for containing and transporting petroleum, the improvements being such that the tanks, although cheaply constructed, are made effectually petroleum-proof, and not liable to become leaky by being subjected to distortions and blows during transportation. At the same time the undue heating of the petroleum is prevented by an exterior casing, between which and the tank intervenes a space for the passage of air.

In order to enable others to make my invention, I will now proceed to describe the manner of carrying it into effect.

On reference to the accompanying drawings, which form part of this specification, Figure 1 is a sectional view of my improved tank or reservoir for storing or transporting petroleum; Fig. 2, the tank as it appears when combined with and forming part of a railway-car; Fig. 3, a transverse section on the line 1 2, Fig. 1; and Figs. 4 and 5, detached sectional views of part of the tank drawn to an enlarged scale.

The main feature of my invention may be briefly described as follows, reference being had to Fig. 1, which represents a wooden tank or reservoir in section.

Petroleum is of that penetrating character that it cannot be contained and transported in ordinary wooden tanks or vats without more or less leakage. Even metal vessels of ordinary weight cannot be so carefully constructed as to be entirely impervious to this fluid, the shocks and jars to which they are subjected tending to impair the joints.

I have found that plates of tinned iron carefully soldered together afford the best medium for resisting the searching action of petroleum; but the difficulty hitherto met with in the use of these plates has been the preserving of them entire and preventing ruptures at the joints and elsewhere. I avoid this by constructing a tank or reservoir, as follows: I make the tank A, Fig. 1, of substantial wooden boards, well stayed, according to the size of the tank, and then line the interior with tinned plates *a*, not in the usual manner by connecting the tin to the wood at repeated intervals, but by so suspending the tin lining *a* within the tank or vessel, that it is detached therefrom at all points excepting at the upper edge, where it is suspended. Thus, in Fig. 1, the tin lining *a* is secured at the upper edge of the vessel, but is entirely detached from the sides and bottom, excepting, perhaps, at one point, where an outlet is necessary, as described hereinafter.

By thus arranging the lining two important ends are attained:

First. As the metal lining is the sole medium for preventing leakage, the exterior wooden structure may be made cheaply and without any regard to accurate finish, no packing or calking being necessary, regard being had only to the strength, which should be sufficient to afford a proper backing for the light metal lining.

Second. As the lining is detached from the vessel at all points excepting where the suspension is effected, the severest shocks or blows imparted to the wooden exterior cannot have any detrimental effect on the lining, which will readily yield and accommodate itself to any twisting or distortion of the wooden casing. As the suspension of the lining is made at a point where the vessel is strongest and least liable to be distorted, the integrity of the metal cannot be easily disturbed at this point.

On filling the reservoir with petroleum the light metal lining will at once be forced against and adjust itself to the interior of the casing.

The lid or cover of the tank or reservoir may be lined with tin plates prior to being secured to the upper edges of the said tank, the tin lining of the latter being lapped over the edges, and these edges being overlapped by the lining of the cover, and the point where the two linings meet being soldered if deemed necessary. If the cover should be of extended area—sufficiently large, for instance, for the top of a tank-car—the tin lining of the roof may be secured to the same at intervals in the manner described hereinafter.

Figs. 2, 3, 4, and 5 represent the above-de-

scribed improvement as applied to and combined with a railway-car, thus forming a tank-car for the transportation of petroleum.

The frame of the car consists of the exterior longitudinal beams E E′ and F′ F and the intermediate longitudinal beams K K, the whole of these beams being connected together by the end transverse beams H and intermediate transverse beams I I.

The tank consists of an oblong box, of boards *e*, the bottom resting on the longitudinal beams E′, F, and K of the frame, and the sides being strengthened by vertical studs *h*, which are secured to the beams E and F′, and which serve to support the roof W of the car. An outer casing, *i*, of boards, forming the exterior of the car, is secured to the studs, this casing resting on the outer longitudinal beams, E and F′, while the vertical boards *e* of the tank rest on the inner beams, E′ and F. A space thus intervenes between the boarding of the tank and exterior boarding of the car, to which space a supply of air can have free access from below.

The interior of the tank is lined with thin tinned plates, in the manner described above, the lining being suspended at the corners *x*, and being detached at all other points excepting where the outlet described hereinafter occurs.

The top G of the tank having an extended area, I strengthen it, and at the same time prevent its tin lining from sagging, in the following manner: I first apply to the entire under surface of the cover a continuous lining of tinned plates, and then secure to the under side of the cover, beneath the lining, a number of transverse beams, *q*, by bolts *n*. (See Fig. 5.) Each of these beams is covered with tinned plates, the edges of which are lapped beneath the beam and the cover, solder being applied at the joints. A continuous uninterrupted surface of metal is thus presented on the under side of the cover.

At the corners *x*, where the lining of the sides and bottom of the tank is suspended, I secure the lining to the wooden exterior of the tank and to the lining of the said cover in the manner best observed on reference to Fig. 4.

M represents the lining adjacent to the cover G; N, the lining adjacent to one of the sides *e*. The edge of lining M is bent downward and upward for the reception of the bent edge of a plate, P, which is confined between the upper edge of the tank and the cover. The upper bent edge of the lining N is lodged within the bend of the edge of the plate P. After being soldered at the point *q′* the joint is complete, and is of the great strength necessary for supporting the sides of the suspended lining, the bottom of which is permitted to rest freely on and to accommodate itself to the bottom of the wooden casing of the tank.

The roof W is surmounted with a longitudinal ventilator, W′, slatted on the opposite sides, and lined with perforated plates *w*, of tinned iron or other metal; and through the top of the tank, as well as through the roof, extends an opening T, Fig. 1, lined with tin plates, this opening being furnished at the top with a detachable cover, *t*.

The opening is made to communicate in two directions with a space, N′, between the top of the tank and the roof, through pipes M′, the portions of which beneath the roof are perforated, as shown in Fig. 2, the pipes being bent at *m m*, so that the petroleum, on being agitated during transportation, and being from time to time raised by splashes into the opening T, cannot escape into the perforated portions of the pipes.

An ordinary conical faucet, X, is secured to the bottom of the tank, near the middle of the same, and communicates with the horizontal pipe Y, situated beneath the tank-frame.

A spindle, L, is secured to the tapering plug of this faucet, and passes upward through the opening T and through the cover *t* of the same. Above the latter the spindle is furnished with a suitable handle, by operating which the contents of the vessel may be withdrawn at pleasure through the pipe Y.

I prefer to make the bottom of the tank slightly inclined downward toward the middle, and to fill the tank with petroleum to a height above the under edges of the transverse beams *q*, the latter preventing any undue agitation of the petroleum during transportation.

It is important that there should be an escape for the gas generated from so large a quantity of petroleum as that contained in the tank, and that this escape should not be in the form of a jet of highly-inflammable gas, readily ignited by a spark from a locomotive, or other accident, but that it should be so freely mixed with a plentiful supply of air that when it escapes from the car it is not in an ignitible state.

The gas from the tank escapes in small dispersed jets, through perforations in the pipes M′ M′ into the gas-chamber N′, between the top of the tank and the roof. Here the jets become mixed with a body of air which is constantly supplied to the chamber through the vertical spaces between the sides of the car and the tank, the air and gas thus mixed escaping through further perforations in the ventilator W′ in a non-ignitible condition.

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

1. A vat or reservoir having an outer casing of wood and a thin petroleum-proof lining of metal, so suspended within the casing and detached from the sides and bottom of the same that it can readily and without danger of rupture yield and accommodate itself to any twisting or other distortion of the vessel, as set forth.

2. The combination, as described, of a tank or reservoir, consisting of an outer casing of wood and a petroleum-proof lining, with the frame of a car.

3. The air-space between the tank and sides and roof of the car, for the purpose described.

4. The perforated pipes M′, or their equivalents, forming a communication between the interior of the tank and the ventilated space N′ beneath the roof.

5. Causing the mixed air and gas to pass through the perforations of the ventilator W′ before it reaches the external air, for the purpose described.

6. The roof G of the tank, with its transverse beams *q*, both being covered with a petroleum-proof lining, substantially as described, and the transverse beams serving to prevent undue agitation of the contents of the tank, as set forth.

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

W. C. ALLISON.

Witnesses:
JOHN WHITE,
H. HOWSON.