G. W. Howard.

Transporting and Storing Oil.

No. 50,126. Patented Sep. 26, 1865.

Fig. 1.

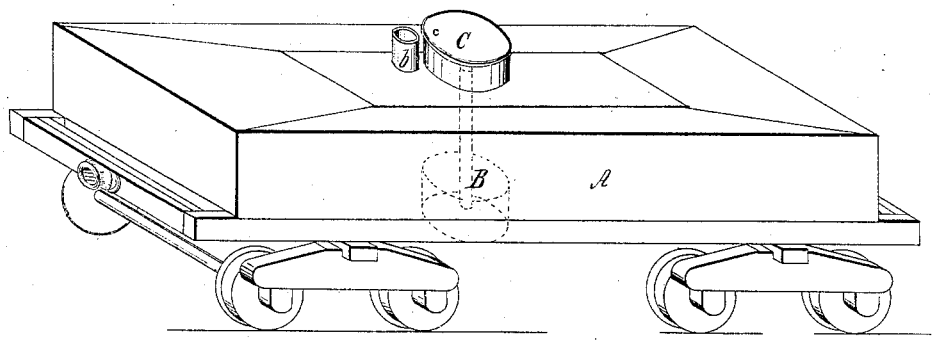


Fig. 2.

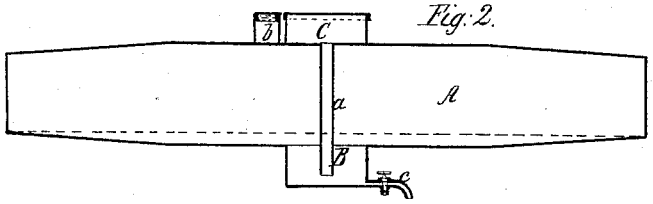
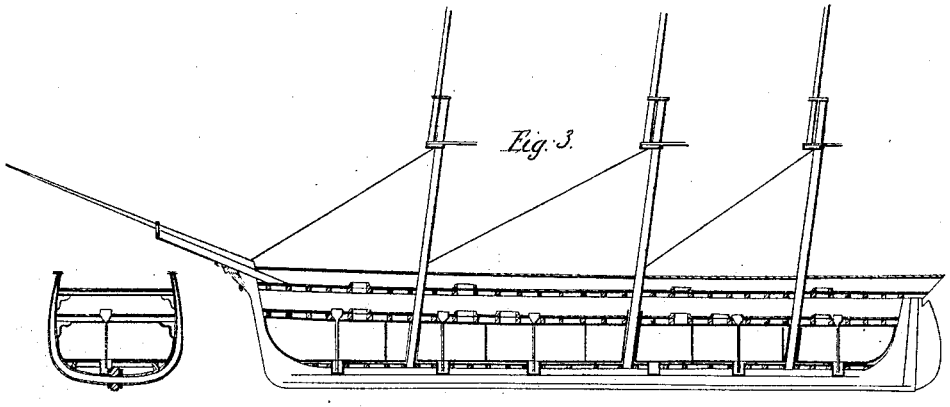


Fig. 3.



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UNITED STATES PATENT OFFICE.

G. W. HOWARD, OF PONTIAC, MICHIGAN.

IMPROVEMENT IN TANKS FOR TRANSPORTING OIL, &c.

Specification forming part of Letters Patent No. **50,126**, dated September 26, 1865.

To all whom it may concern:

Be it known that I, GEORGE W. HOWARD, of Pontiac, in the county of Oakland and State of Michigan, have invented a new and useful Improvement in Tanks for Transporting and Storing Mineral Oils, of which the following is a full, clear, and accurate description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a view in perspective of my invention adapted to railroad transportation. Fig. 2 is a longitudinal central section through the same; and Fig. 3 is a view of a tank as applied to a ship.

The magnitude of the production of petroleum and the commerce incident thereto renders some effectively economical mode of transporting and storing it a desideratum, and this it is the object of my invention to supply by a tank that shall effectively prevent all those casualties incident to this peculiar commodity and the known modes of transporting and storing the same.

It is well known that when closed vessels are filled and used for transporting and storing petroleum they are liable to be fractured by the expansion of their contents, which produces great waste, and that when tight vessels only partially filled are used expansive gases are generated, which escape and, mingling with the atmosphere, become highly inflammable, so as to cause destruction of life and property, and the latter cause has already produced extensive calamities. If transported or stored in open or ventilated vessels the lighter portions of these oils evaporate, and the heavier thicken and blacken, and deteriorate in value, and are more liable to become ignited from the larger surface exposed; besides which the surging that takes place in all transit, whether by rail or ship, renders the agitation in the open vessels, whether barrels or tanks, liable to all the objection to rolling cargo of any kind, and augments evaporation from the oils as well as deteriorates the mass in value.

Now, my invention obviates all the causes of waste, and renders the transportation and storage of oils positively safe, and of course secures an important economy in dispensing with barrels and in the quantity of oil that is saved, and in casualties; and to this end my invention consists in forming the tank for transporting and storing mineral, animal, or vegetable oils in large quantites of suitable sheet metal, made in any form, but adapted to the conveyance to be employed, perfectly tight, with a well centrally placed in the bottom of the tank, which communicates with a cistern or reservoir on the top of the tank by a pipe that enters the well, and filling the well and covering the bottom of the tank with water for the purpose of accommodating expansion in the oil, and having pipes suitably arranged to fill and discharge the tank.

In adapting my invention to a railroad-car I construct the tank A of the length and width of the car-frame, and of any determined height to contain a quantity of oil that shall constitute a proper burden for a single car or truck-frame. The tank A, I make of light sheet metal, suitably braced for strength, with a well, B, placed centrally in its bottom, the well being of a depth equal, or nearly equal, to its diameter. On the top of the car I place a reservoir, C, having a perforated top, and in the construction the bottom of the reservoir may constitute a part of the top of the tank. A pipe, *a*, passes from the bottom of the reservoir to the center and nearly to the bottom of the well B, this pipe being open from the cistern to the well. I place a pipe, *b*, in the top of the tank through which to introduce the oil into the tank, and at the side of the well I place a pipe, *c*, through which the contents of the tank can be withdrawn.

The tank thus constructed and properly placed upon its truck-frame is made to receive a sufficient quantity of water to fill the well and cover the bottom of the car an inch or so in depth, as shown in the red dotted line of Fig. 2, when the tank can be filled with oil in any suitable manner through the pipe *b*, which must be closely stopped when the tank is entirely full. Now, as the increase of temperature causes the oil to expand in the tank A the water will be forced up the pipe *a* into the reservoir C from the well B and bottom of the tank, and should the expansion be excessive the surplus water can flow off through the ventilating-orifices in the top of the cistern without any waste of oil or danger of bursting the tank; and when, from a change in temperature, the

oil in the tank contracts in volume, the water will return from the reservoir to the well and bottom of the tank, and thus, keeping the tank always full, will tend to prevent the generation of gases from the oil, and also preclude surging or slopping.

It is obvious that, instead of one tank for a single railroad truck frame, the tank can be varied in dimensions, for the convenience of handling or transporting on common wagons, into two or more tanks, and that these, when filled, may be hoisted by a crane to be placed upon or removed from the truck or wagon. It is also obvious that the form of the tank can be varied without departing from my invention.

To adapt my invention to stationary storage fire-proof tanks it is only necessary to place a reservoir on the top of each tank and pass therefrom an open connection-pipe to near the bottom of the stationery tank, when, covering the bottom of the tank with a quantity of water sufficient to rise a few inches above the bottom end of the pipe, and filling the remainder of the tank with oil, the action of contraction and expansion will produce the same result as when the well is employed in the transporting-tank.

To adapt my tank to ships for ocean navigation it may be necessary or convenient to form their outline to correspond with the mold of the ship, but no other change in the tank or tanks will be required, for the entire hold may be filled with a single tank, strengthened properly by braces and partitions or bulk-heads, or it may be filled by sectional tanks sectionally arranged to correspond with the mold of the interior of the ship, only taking care to have wells, reservoirs, and filling and emptying pipes to each separate section of the tank.

For transportation on inland waters, whether lakes or rivers, floating craft may be constructed to receive my tanks adapted in any form of outline for convenient storage, or the tanks can be so made as to be floated or towed independently.

It is of course indifferent to my invention how this tank is filled or emptied, for it is equally well adapted to the use of siphons, pumps, or hose for either purpose.

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

1. The closed tank for transporting or storing oils securely, when arranged and operating substantially in the manner described.

2. Accommodating the expansion or contraction of oils in closed tanks by the resistance of a column of water, substantially in the manner described.

3. The combination of the tank, cistern, and reservoir, substantially in the manner and for the purpose set forth.

In testimony whereof I have hereunto subscribed my name.

G. W. HOWARD.

Witnesses:

EDM. F. BROWN,

WM. D. BALDWIN.