Oct. 3, 1939. R. G. ANDERSON 2,175,010

LOCOMOTIVE STORAGE TANK ARRANGEMENT

Filed May 11, 1938 2 Sheets-Sheet 1

Fig. 1.

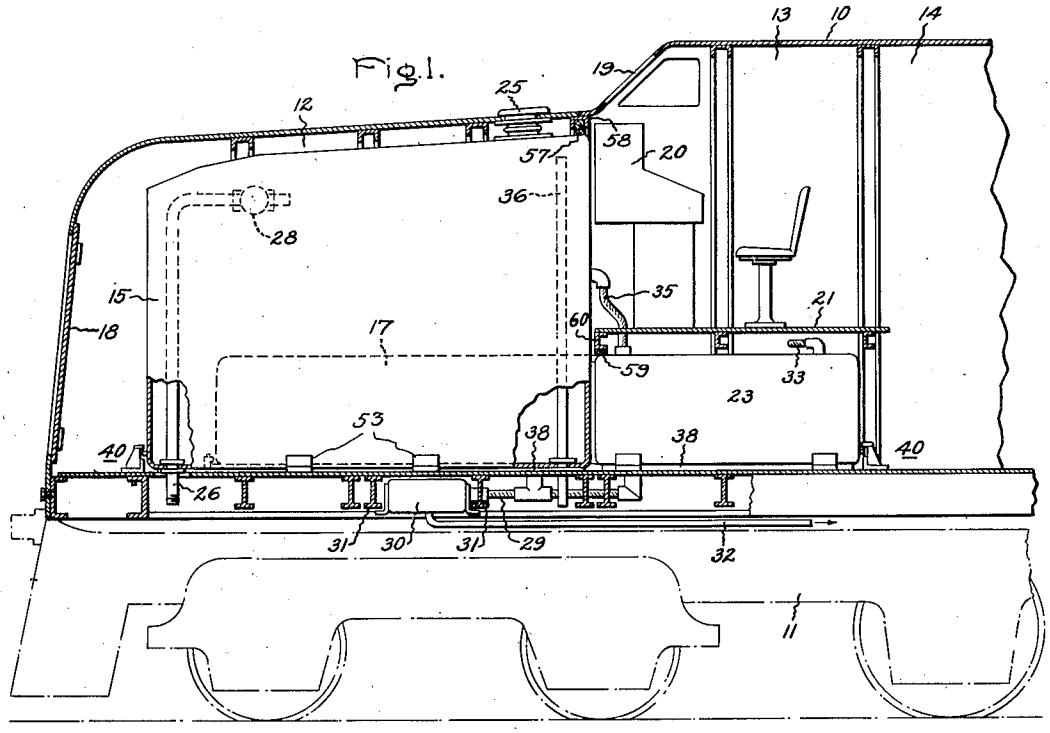
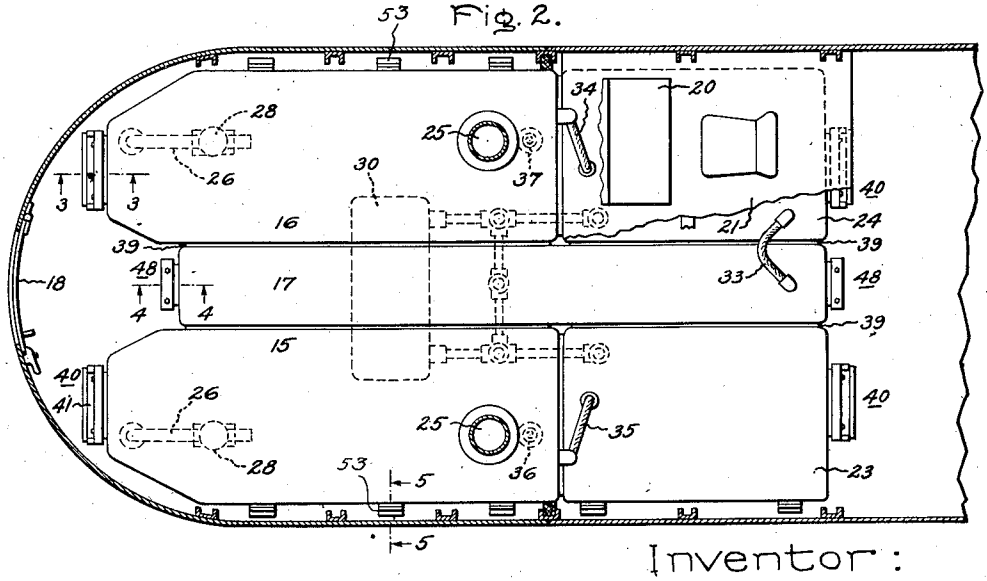


Fig. 2.



Inventor:
Robert G. Anderson,
by Harry E. Dunham
His Attorney.

Oct. 3, 1939. R. G. ANDERSON 2,175,010

LOCOMOTIVE STORAGE TANK ARRANGEMENT

Filed May 11, 1938 2 Sheets-Sheet 2

Fig. 3.

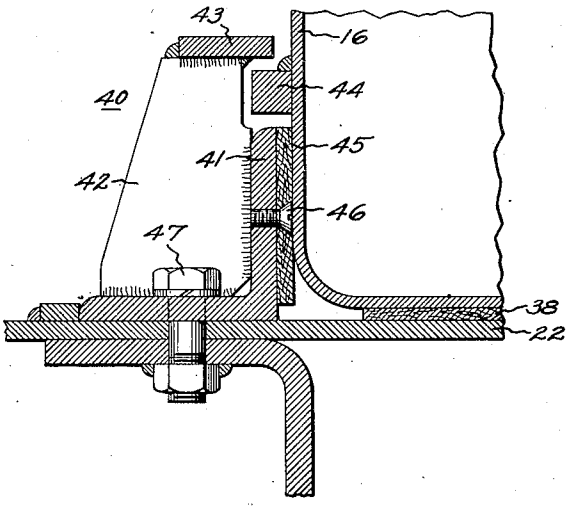


Fig. 4.

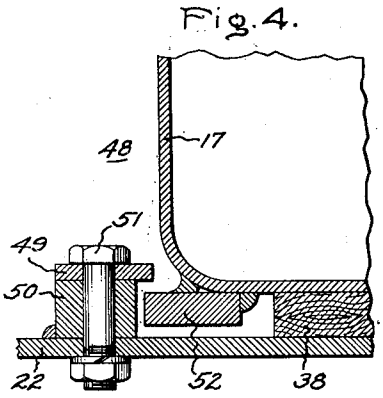
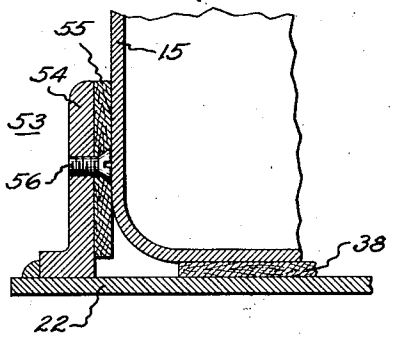


Fig. 5.



Inventor:
Robert G. Anderson,
by Harry E. Dunham
His Attorney.

Patented Oct. 3, 1939

2,175,010

UNITED STATES PATENT OFFICE

2,175,010

LOCOMOTIVE STORAGE TANK ARRANGEMENT

Robert G. Anderson, Erie, Pa., assignor to General Electric Company, a corporation of New York

Application May 11, 1938, Serial No. 207,290

4 Claims. (Cl. 105—26)

This invention relates to locomotive vehicles and more particularly to arrangements of liquid storage reservoirs in locomotives of the self-contained type.

In railway locomotives of the high speed type, it is desirable to maintain a minimum overall length and to eliminate the usual auxiliary tender for carrying the fuel and water supply by mounting the reservoirs therefor upon the same carriage with the power plant.

It is an object of this invention to provide a new and improved arrangement of liquid storage reservoirs in the forepart of the locomotive vehicle.

It is a further object of this invention to provide a new and improved arrangement for mounting a plurality of liquid storage reservoirs in a locomotive vehicle so as to minimize the transmission of rupturing stresses thereto from the vehicle framework.

A further object of this invention is to provide a new and improved arrangement of liquid storage reservoirs in a compartment of the locomotive vehicle providing a passageway extending therethrough longitudinally of the vehicle.

Other objects and advantages will be pointed out in the specification as the description proceeds while still others will be obvious from the disclosure.

For a consideration of what I believe to be novel and my invention, attention is directed to the following description and the claims appended thereto taken in connection with the accompanying drawings.

In the drawings, Fig. 1 is a longitudinal sectional view of a portion of a railway locomotive vehicle which is provided with an arrangement of liquid storage reservoirs according to my invention, Fig. 2 is a plan view of the arrangement shown in Fig. 1, and Figs. 3, 4, and 5 are detail views of the tank retaining means.

Referring to the drawings, 10 is the locomotive enclosing housing mounted upon an undercarriage 11. A liquid storage compartment 12 is provided in the forepart of the housing immediately to the rear of which is the control compartment 13 followed by the power plant compartment 14 extending toward the rear of the locomotive.

In the operation of the locomotive over the more or less uneven railroad beds, the framework of the vehicle is subjected to considerable warping and twisting movements. To minimize the danger of such movements of the locomotive framework causing rupturing of the seams of the liquid storage tanks, I prefer to distribute the storage capacity in a plurality of relatively smaller, and hence, inherently stronger, individual tanks. As shown, I provide a pair of main tanks 15 and 16 disposed along the opposite side walls of the compartment and, for reasons of space economy, extending substantially from the floor to the roof of the compartment. The pair of tanks are spaced apart by a third intermediate tank 17 which is of a relatively low height which provides above it, and between the pair of tanks, a passageway extending from the control compartment 13 to a door 18 provided in the front portion of the vehicle housing. The desirability of such a passageway is obvious, particularly in switching operations and, in the event that the locomotive is being used as a pusher, to facilitate passage of trainmen between the locomotive and the other cars of the train.

It will be noted that the roof of the vehicle housing or hood over the forward liquid storage compartment is materially lower than the roof over the control compartment providing an offset portion in which a window 19 may be placed. Thus, a wide angle of unobstructed visibility is afforded the operators seated at the control panel 20. Depending upon the overall height of the locomotive, the floor 21 of the control compartment is elevated above the floor of the vehicle a considerable amount creating a space which may be economically utilized by locating additional storage tanks 23 and 24 on opposite sides of the extended intermediate tank 17.

The storage tanks may be filled from tower spouts through covered openings 25 in the tops of the main tanks or through pipe connections 26 extending through the bottoms of the main tanks 15 and 16, respectively, which pipes terminate in an upper region of the tanks, a check valve 28 being provided near the ends thereof for precluding spilling of liquid therefrom when the locomotive is in operation. By an arrangement of flexible interconnections 29 communicating through the bottoms of the various tanks, liquid passed into either one of the main tanks will distribute through the remainder to fill completely the lower tanks and maintain equal levels in the main tanks. The intercommunicating connections 29 are also connected to a sump tank 30 disposed beneath the floor of the vehicle and between transverse frame members 31. The liquid is supplied to the locomotive power plant from the sump tank through the connection 32. A flexible connection 33 is provided for venting the intermediate tank 17 into an adjacent tank

24 which in turn is vented by connection 34 to one of the main tanks 16. The tank 23 is vented into the tank 15 by means of connection 35. The main tanks 15 and 16 are vented through suitably arranged overflow pipes 36 tnd 37, respectively, which extend from a point in the upper region of the tanks downwardly through the bottoms thereof to atmosphere.

It is preferred not to rigidly secure the various tanks in position in the vehicle but rather to cradle them by an arrangement of semi-resilient spacers of any suitable material such as wood. As indicated, suitable wooden strips 38 may be placed between the bottom of the various tanks and the floor 22 of the vehicle. Wooden spacers 39 are also placed between the various tanks to prevent metallic contact between them. With the tanks thus more or less cradled on wooden supports, limited relative shifting movements may take place between the tanks and the vehicle framework and the transmission of warping movements from the framework to the tanks is further minimized. For limiting the shifting movements of the various tanks, I provide retaining devices 40 at the forward ends of the main tanks 15 and 16 and also at the rear of the tanks 23 and 24, respectively. These devices are shown more clearly in detail in Fig. 3. The device comprises a length of angle iron 41 to which are welded a plurality of vertically arranged plates 42 extending somewhat above the angle side. A bar 43 is welded across the top of the plates 42 in a slightly overhanging manner as shown, so as to extend above a lug 44. The lug may comprise a bar of suitable size and shape welded to the side wall of the tank 16 in such a manner that it will extend between the top of the angle piece 41 and the overhanging edge of the bar 43 and in spaced relationship thereto substantially as shown. A wooden spacer 45 is secured to the angle side as by screws 46 to prevent metallic contact between the retaining device and the tank. The retaining device may be removably secured to the floor of the locomotive vehicle as by bolts 47. By the arrangement shown, it is seen that limited relative shifting movements between the tank and the vehicle floor may take place, excessive vertical movements of the tanks, however, being precluded by the engagement of the lug 44 with the edge of the overhanging bar 43. A similar retaining arrangement, used in connection with the smaller intermediate tank 17, is shown in detail in Fig. 4. This arrangement may comprise a bar 49 and a spacer block 50 secured to the floor by means of bolts 51. An overhanging edge of the bar 49 extends above a lug 52 secured to the lower portion of the tank 17 and in spaced relationship thereto, to limit vertical movement of the tank. Excessive sidewise shifting of the storage reservoirs may be precluded by means of brackets 53 shown in detail in Fig. 5. These brackets may comprise angle sections 54 secured to the floor 22, as by welding, at spaced intervals adjacent the outer sides of the tanks. The vertical portion of the angle piece may be faced with a wooden spacer block 55 secured thereto by screws 56 to prevent metallic contact between the tank and the bracket. It will be noted that while the vertical movements of the forward ends of the main tanks 15 and 16 are precluded by means of the retaining devices 40, space requirements may not allow the use of such devices at the opposite ends of these tanks. In the present instance I provide wooden spacer blocks 57 arranged between a channel frame section 58 and the top of the tanks. In a similar manner spacer blocks 59 may be provided between the forward ends of the smaller tanks 23 and 24 and the transverse member 60.

Although either fuel oil or water may be stored in the system of interconnected reservoir tanks, it is obvious that some may be used for storing water and others for storing fuel oil as desired, making such changes in the flexible interconnections as are necessary. I prefer, however, to store only water in the tanks located in the forward compartment as a safety measure, and to store the fuel in tanks located similarly, for example, in the rear end of the locomotive. Thus in the event of a collision, causing the bursting of the tanks, the possibility of a resulting fire is minimized.

A still further advantage in the arrangement shown is in the fact that the hood over the liquid storage compartment may be easily removed rendering the various tanks accessible for rapid replacement or repair.

Among the numerous advantages of the arrangement disclosed is that while the locomotive operators have practically an unlimited and unobstructed vision ahead, the control compartment is located a safe distance from the front of the vehicle. In the event of a collision occurring as the result of an obstruction on the right of way, the relatively flexible tanks act as a buffer between the nose of the vehicle and the control compartment. Also, with the power plant compartment located toward the rear the temperature in the control compartment can be easily regulated to a fine degree by a system of adjustable louvers suitably located in the outer walls of the compartment. Gases, fumes or escaping steam can also be easily precluded from rendering the control compartment uncomfortable for the operators, since these will be carried rearwardly by the natural circulation of air through the vehicle.

Having described my invention in what I now consider to represent the best embodiment thereof, I desire to have it understood that the specific arrangement shown is only illustrative and that it is subject to further obvious modifications falling within the spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A railway locomotive vehicle having an enclosing housing, a water storage compartment in the forepart of said housing, a plurality of water storage tanks in said compartment including a pair of longitudinal tanks arranged along opposite side walls of said housing and extending substantially from the floor to the roof of said housing, means including a third water storage tank of relatively lower height for spacing said pair apart and providing a passageway through said compartment, means resiliently separating said tanks from said housing and from each other, flexible conduits connecting the lower portions of said tanks allowing equalization of water level in said plurality of tanks, and means interconnecting said tanks for venting same to atmosphere.

2. A railway locomotive vehicle having a water consuming power plant, an enclosing housing for said vehicle, a water storage compartment in the forepart of said housing, a pair of longitudinal water storage tanks arranged along opposite side walls of said compartment, a third water storage tank of relatively lower height for spacing said

pair apart and providing a passageway between said pair, means resiliently separating said tanks from said housing and from each other, removable means loosely retaining said tanks in position so as to permit limited shifting movements of the individual tanks, and a portion of said housing over said water storage compartment being removable so as to allow removal of any of said tanks.

3. In a railway locomotive vehicle having an enclosing housing, a liquid storage compartment in the forepart of said housing, a pair of liquid storage tanks in said compartment arranged along opposite side walls of said housing, means for loosely retaining said tanks in position allowing limited relative shifting movements between said tanks and said vehicle, means for spacing said pair of tanks apart providing a passageway through said compartment and flexible connections between the lower portions of said tanks for maintaining an equal distribution of liquid in said tanks.

4. In a railway locomotive vehicle, a housing on said vehicle, a pair of liquid storage tanks arranged along opposite side walls of said housing in the forepart thereof, removable means for loosely retaining said tanks in a spaced apart relationship, relatively flexible conduits connecting the lower portions of said tanks for allowing equalization of liquid level in said tanks, and means for venting said tanks to atmosphere.

ROBERT G. ANDERSON.