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T. M. ELFVING

2,963,880

MECHANICALLY REFRIGERATED RAILWAY CAR

Filed March 6, 1956

2 Sheets-Sheet 1

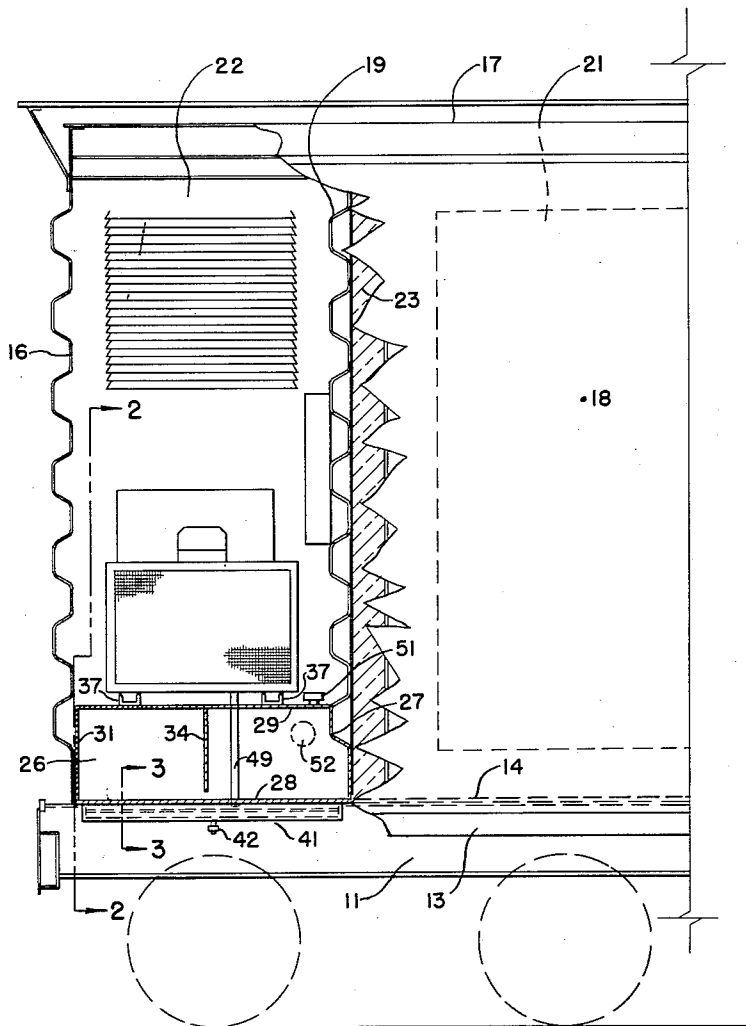


Figure 1

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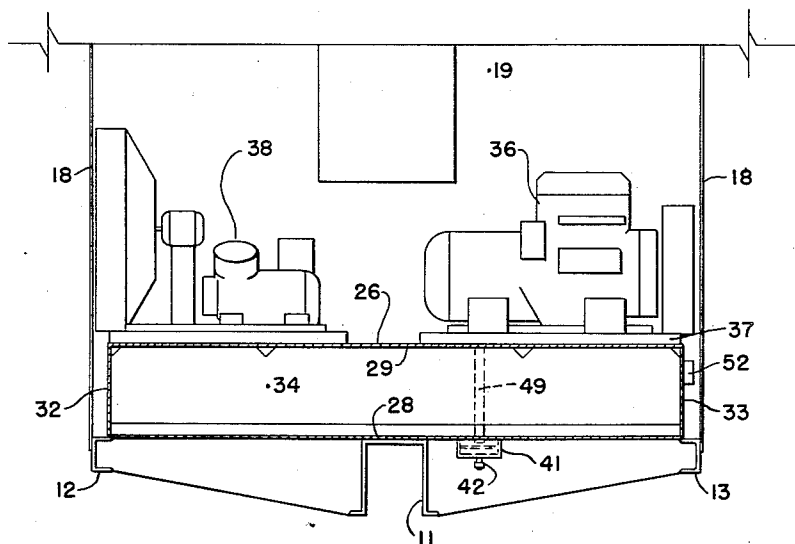


Figure 2

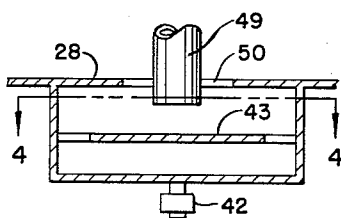


Figure 3

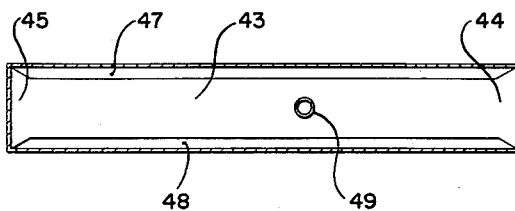


Figure 4

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2,963,880

MECHANICALLY REFRIGERATED RAILWAY CAR

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7 Claims. (Cl. 62—239)

The present invention relates generally to mechanically refrigerated railway cars and more particularly to a fuel system for use therewith.

Generally, mechanically refrigerated railway cars are divided into two compartments: the lading compartment in which the commodity to be transported under refrigeration is carried; and the machine compartment where the prime mover, generator and other mechanical equipment is disposed. The prime mover, which supplies the mechanical power for driving the generator and the condensing unit, is generally of the diesel type.

The fuel tanks for supplying fuel to the prime mover are usually disposed underneath the railway car between the centersill and one of the sidesills. When mounted in this manner the tanks are exposed to surroundings. Consequently, the fuel is subjected to extremes in temperature, the tanks are subject to damage from objects, and long fuel lines are required to convey the fuel to the prime mover.

The lines are in the open and may be tampered with. The lines are also subjected to the outside temperatures. Because of the exposure of the tanks and lines, with resulting unfavorable viscosity at the low temperatures, it is often necessary to pre-heat and recirculate the fuel in order to efficiently operate the prime mover.

It is an object of the present invention to provide a novel fuel system for use in mechanically refrigerated railway cars.

It is another object of the present invention to provide a fuel tank which is disposed in the machine compartment of the mechanically refrigerated railway car in heat exchange relation to the prime mover and/or the condensing unit.

It is another object of the present invention to provide a fuel tank which is mounted on the bottom of the machine compartment and upon which the mechanical equipment may be mounted.

It is another object of the present invention to provide a fuel tank which is disposed at the bottom of the machine compartment and serves to mount the mechanical equipment. The filling spout is located in the machine compartment, and the liquid level gauges may be mounted to be conveniently read from the outside of the car.

These and other objects of the invention will become more apparent from the following description taken in conjunction with the accompanying drawing.

Referring to the drawing:

Figure 1 is a sectional elevational view showing the machine compartment with a fuel tank mounted therein;

Figure 2 is a view taken along the line 2—2 of Figure 1;

Figure 3 is an enlarged sectional view taken along the line 3—3 of Figure 1; and

Figure 4 is an elevational view taken along the line 4—4 of Figure 3.

Referring to Figures 1 and 2, the railway car illustrated includes centersill 11 and sidesills 12 and 13 which are disposed longitudinally of the car and serve to sup-

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port the same. A suitable floor 14 is carried by the center and sidesills. The remainder of the construction of the car comprises a pair of end walls 16, roof 17 and side walls 18.

5 The railway car illustrated includes an insulated transverse bulkhead 19 which serves to divide the car into a lading compartment 21 and a machine compartment 22. Suitable insulation 23 is placed on the lading side of the transverse bulkhead and serves to insulate the machine compartment from the lading compartment. The re-

10 frigerated lading compartment may be of the well known types, for example, of the envelope type. A fuel tank 26 (Figures 1 and 2) is disposed in the lower portion of the machine compartment 22 and extends transversely across the compartment, occupying and forming the bottom of the same, as illustrated. The tank may be built as a separate insertable unit or certain of the walls of the tank may include portions of the railway car. For example, referring to Figure 1, 20 the wall 27 of the tank is formed by the transverse bulkhead 19. A bottom 28 and a top 29 is suitably affixed thereto, as, for example, by welding. The wall 31 is affixed to the top and bottom. End walls 32 and 33 are suitably affixed thereto to form an enclosed tank. 25 Disposed within the tank and extending across the same is a baffle 34 which is suitably attached to the top 29. The baffle 34 serves to reduce splashing of the fuel carried within the tank.

The machinery may be suitably mounted on the top of the tank. Thus, the diesel prime mover 36 is mounted on channels 37 which rest directly upon the top 29 of the tank with the machinery suitably mounted thereto by shock absorbing means (not shown). The refrigeration unit 38 including the compressor and condenser may also be suitably mounted on the tank. Thus, the top of the fuel tank is in heat exchange relation to the relatively warm prime mover and compressor equipment whereby it is heated by conduction, radiation and convection. This pre-heats the fuel and keeps it at uniform 40 temperature.

A sump 41 is formed in the bottom of the tank and extends longitudinally with the railway car. The sump 41 serves to perform two functions; one, the fuel pipe extends within the sump whereby the open end is always submerged as the railway car is moved. The second function of the sump is to purge the fuel of any water which drops into the sump. A suitable valve 42 may be provided at the bottom of the sump and the sump may be periodically drained. To trap the water and foreign material in the sump, a member 43 has its ends 44 and 45 suitably attached to the ends of the sump. The central portion of the member 43 is narrower than the width of the sump whereby openings 47 and 48 are formed for water or foreign matter to drop into the 55 sump. The member 43 acts as a baffle whereby the water and foreign matter does not readily find its way back into the fuel. The fuel pipe 49 extends through the top of the tank and protrudes a distance below the level of the bottom of the tank into the sump through a suitable opening 50. Thus, as previously described, the end of the fuel pipe 49 is always submerged in fuel. 60

The filling spout 51 may be disposed at the top of the tank within the machine compartment. Suitable fuel gauges may be associated with the tank and mounted to be read from the exterior of the railway car. Such a gauge is schematically shown in Figures 1 and 2 at 52. It is also apparent that the filling spout 51 may be placed external of the machine compartment where it may be filled from the side or the end of the car. 65

The fuel tank described may be mounted on the floor 14 of the railway car. Preferably, the tank is mounted directly on the center and sidesills and forms the floor 70

of the machine compartment. The tank is shorter than the width of the car whereby a space is provided between the ends of the tank and the sides of the car. The side-sills then form steps for entrance into the machine compartment. The space may also be used to house gauges and other measuring equipment.

Thus it is seen that I have provided a novel construction for the machine compartment of a railway car. The fuel tank is disposed within the machine compartment and serves to support the equipment housed in the machine compartment. The length of fuel lines necessary to bring the fluid from the fuel reservoir to the prime mover is minimized. Tampering with and damage to the fuel system is prevented since it is disposed within the machine compartment. Another advantage gained by disposing the fuel tank according to the invention is that the tank is not exposed to extremes in temperature. Because of its being in heat exchange relation with the prime mover and compressor, the fuel is maintained at a temperature which will ensure efficient and economical operation of the prime mover.

I claim:

1. A mechanically refrigerated railway car including a center sill running longitudinally of the car and serving as part of the underframe to support the body of the car, a transverse bulkhead spaced from one end wall of the car and serving to divide the car into machine and lading compartments, an elongated fuel tank mounted in the machine compartment across the center sill, supporting means carried by said fuel tank, a prime mover, and a refrigeration unit, said prime mover and refrigeration unit mounted on said supporting means at opposite ends of said tank.

2. A mechanically refrigerated railway car as in claim 1 wherein said fuel tank and said prime mover and refrigeration unit are in heat exchange relationship whereby the fuel carried by the tank is preheated.

3. A mechanically refrigerated railway car as in claim 1 wherein said fuel tank has a sump running longitudi-

nally of the car and means on said sump serving to purge the fuel.

4. A mechanically refrigerated railway car as in claim 1 wherein a portion of said bulkhead forms one wall of said tank.

5. In a mechanically refrigerated railway car, center and side sills running longitudinally of the car and serving to support the body of the car, a transverse bulkhead between the side walls of the car and spaced from one end wall of the car and serving to divide the car into machine and lading compartments, a fuel tank mounted at the bottom of said machine compartment across the center sill, said fuel tank being shorter than the width of the car to form a space between the ends of the tank and side walls of the car, supporting means carried by said fuel tank, a prime mover, and a condensing unit, said prime mover and condensing unit mounted on said supporting means at opposite ends of said tank.

6. A mechanically refrigerated railway car having a transverse bulkhead spaced from one end wall of the car and dividing the car into machine and lading compartments, an elongated fuel tank mounted transversely of the car at the bottom of said machine compartment, supporting means carried by the upper part of said fuel tank and adapted for mounting machinery thereon, a prime mover, and a condensing unit, said prime mover and condensing unit mounted on said supporting means at opposite ends of the tank.

7. A mechanically refrigerated railway car as in claim 6 wherein said fuel tank and said prime mover are in heat exchange relationship whereby fuel carried by the tank is preheated.

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