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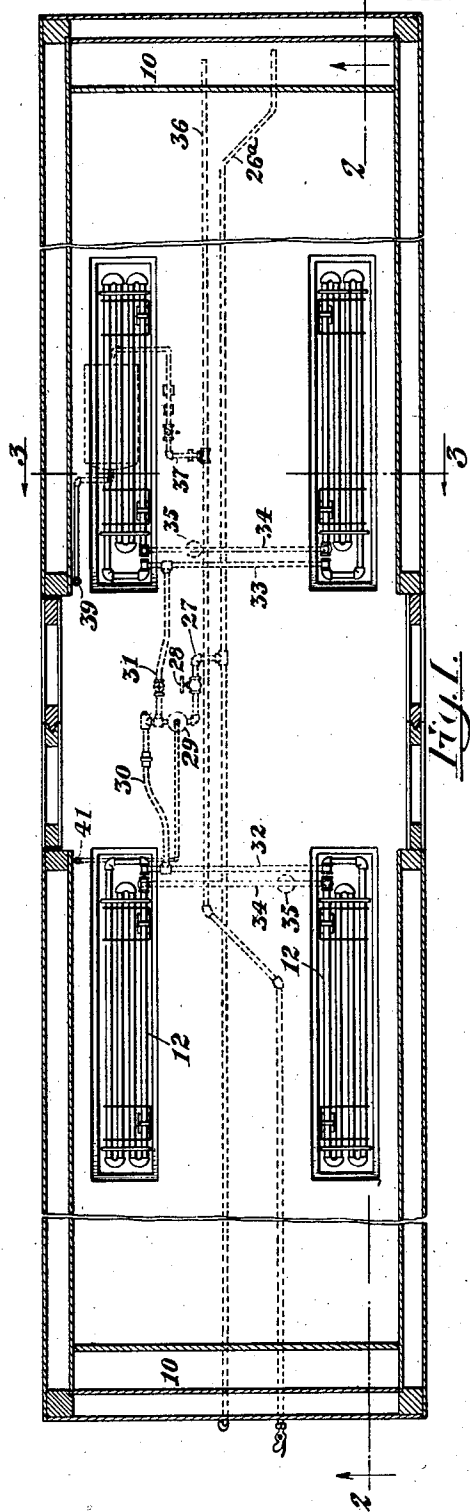
1,521,643

A. L. MOORSHEAD

STEAM HEATED FREIGHT CAR

Filed Oct. 9, 1919

2 Sheets-Sheet 1



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Fig. 3.

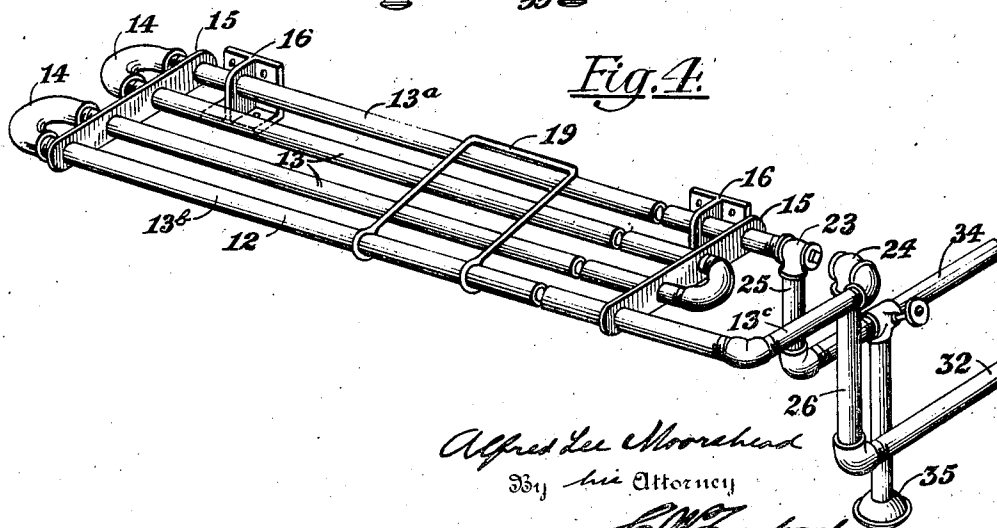
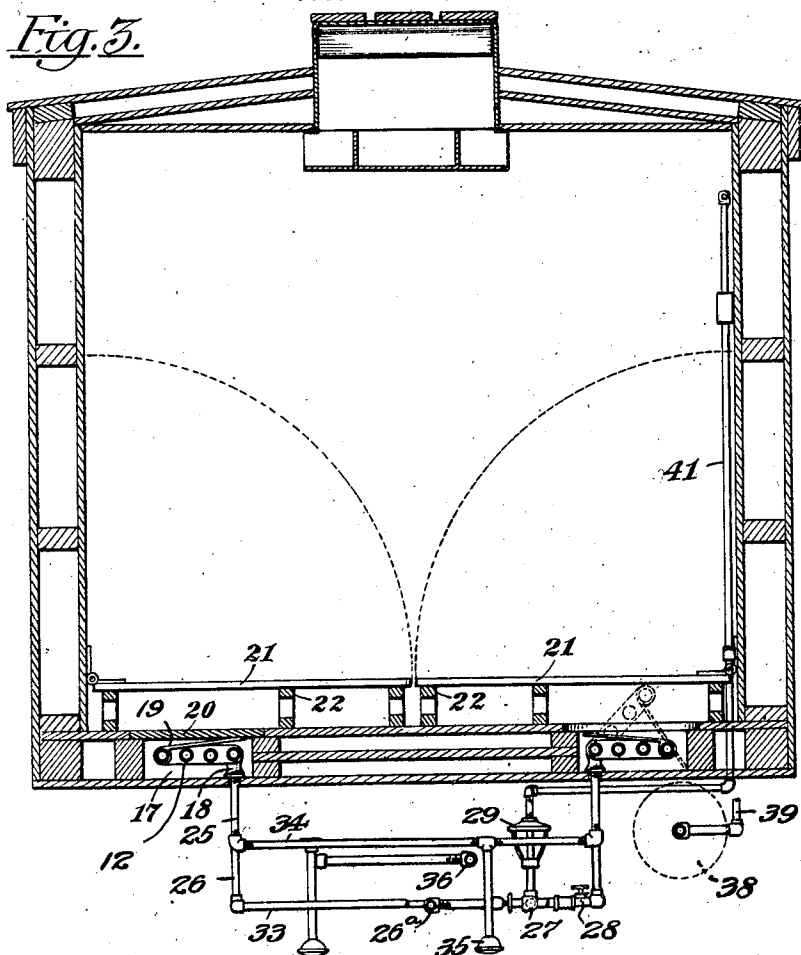


Fig. 4.

Alfred Lee Moorshead
By his Attorney
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UNITED STATES PATENT OFFICE.

ALFRED LEE MOORSHEAD, OF RUTHERFORD, NEW JERSEY.

STEAM-HEATED FREIGHT CAR.

Application filed October 9, 1919. Serial No. 329,538.

To all whom it may concern:

Be it known that I, ALFRED LEE MOORS-
HEAD, a citizen of the United States, and
resident of Rutherford, in the county of
Bergen and State of New Jersey, have in-
vented certain new and useful Improve-
ments in Steam-Heated Freight Cars, of
which the following is a specification.

In my prior application, Serial No. 854-
535, filed August 1, 1914, Patent Number
1,318,457, granted October 14th, 1919, I have
disclosed a freight car heating system de-
signed for use in the storage and transporta-
tion of such goods as should be kept at a
temperature different from that of the out-
side atmosphere, for instance, above the
freezing point during freezing weather. As
one important feature of my invention
claimed in said patent, I provided a ra-
diator which may occupy such a position
as not to interfere with the goods or
reduce the capacity of the storage space
when the car is used for the shipment
of goods which do not require to be heated.
This radiator may be brought out to such a
position that air may freely circulate about
it and a proper current of heated air be de-
livered to the bottom of the storage cham-
ber when the goods in the latter are to be
heated.

My present invention relates to the same
general system and involves certain impor-
tant improvements over the specific con-
struction there illustrated. Among the ob-
jects of my present invention are to secure
a more effective engagement of the circula-
ting air with the heater, to secure a more
effective drainage of the water of condensa-
tion from the system and particularly from
the heater if steam be the heating medium,
to simplify the construction of the heater
itself, and to simplify the support which
permits the heater to be held in exposed or
stored positions. A further important ob-
ject of my invention is to more effectively
control the supply of heating medium to the
heaters or radiators in accordance with the
temperature within the body of the car.
Other important objects and features of
construction will be pointed out hereinafter.

In the accompanying drawings to which
reference is to be had I have illustrated one
embodiment of my invention although it
will be evident that various changes within
the scope of the appended claims may be

made without departing from the spirit of
my invention.

In these drawings:

Fig. 1, is a horizontal section through a
car provided with my improved system, said
section being taken substantially on the line
1—1 of Figure 2.

Figure 2, is a vertical longitudinal sec-
tion taken on the line 2—2 of Figure 1.

Figure 3, is a transverse section on a
somewhat larger scale and taken on line
3—3 of Figure 1, and

Figure 4, is a perspective view of one of
the radiators showing a slightly modified
form of pivotal support.

I have illustrated my invention as being
embodied within a car which may serve as
a refrigerator car or as a ventilator car.
The walls of the car are comparatively
thick and of any suitable insulated con-
struction such as is commonly used in re-
frigerator cars. I have made no attempt in
the drawings to illustrate any specific or de-
tailed character of wall construction. The
car as shown has ice compartments 10 at
the opposite ends thereof, and combined
ventilators and ice hatches 11, above the
same but these features form no portion of
the invention hereinafter claimed.

Adjacent to one or more of the walls of
the car and preferably the bottom wall or
floor, I provide the required number of
heaters or radiators depending upon the
amount of radiating surface necessary to
effect the maintenance of the desired differ-
ence in temperature between the outside
atmosphere and the storage compartment.
As shown, I provide four of these radiators
12, spaced in pairs adjacent to the opposite
side walls and at opposite sides of the usual
middle side doors. Each radiator may be
formed of a plurality of parallel lengths of
pipe 13 with return bends 14, as shown par-
ticularly in Figure 4. The number of these
pipes will depend upon the diameter and
length to give the desired radiating surface.
The pipes are held properly spaced by two
or more transverse cleats or braces 15 and
one pipe preferably the extreme one 13^a at
one side is mounted in one or more brackets
16, so as to constitute a pintle or hinge about
which the radiator may be swung.

Preferably each radiator is mounted in a
recess 17, slightly larger than the radiator
and of such depth that the radiator may lie

entirely below the upper surface of the floor. The brackets 16 as shown in Figure 4 are adapted to be secured both to the bottom and one side wall of the recess although any other form of bracket may be employed, as for instance, the brackets 18, shown in Figure 3, which rest only on the bottom of the recess. The radiator may be swung about the side pipe or pivot 13^a so as to be raised out of the recess and to a material extent above the surface of the floor. Preferably the opposite side pipe 13^b has a brace 19 pivoted thereto and normally adapted to lie on top of the radiator as shown in Figure 4 and at the left hand side of Figure 3, but when the pipe 13^b is lifted the brace or support 19 may be swung over and its free end placed in the recess adjacent to one side thereof so as to constitute a leg and hold the radiator in raised position as illustrated at the righthand side of Figure 3.

Each recess preferably has a cover 20 adapted to set in so as to lie with its upper surface flush with the upper surface of the balance of the floor. These covers may be stored in any convenient part of the car when the radiators are raised. These covers have purposely been omitted from Figure 1 so as to avoid confusion.

When the radiators are to be raised out of their recesses and used for heating the car I preferably use a separate perforated false flooring spaced above the main floor so as to facilitate the distribution and upward movement of the air heated by the radiators. This floor may be made in any conveniently sized sections and may be taken out or stored against the sides of the car when the radiators are within their recesses and the covers 20 are in place. This false flooring may be made of two sections 21 each formed of cleats or spaced boards secured to perforated supports 22 and each hinged to its corresponding side of the car so as to be swung up against the side and held there when not in use. This false flooring may be sub-divided transversely of the car so as to facilitate handling. In Figure 1 I have shown this false flooring entirely removed in order to more clearly illustrate the parts therebeneath. The supports 22 are of such height with respect to the width of the radiators and the character of the supporting braces 19 of the latter that the upper side of the radiator comes adjacent to the false flooring when the radiator is raised as shown in Figure 3. When in this position the air moving transversely beneath the false flooring will come into effective engagement with the separate pipe lengths of the radiator as each pipe length is at a different elevation. At the same time any water of condensation in the heater will automatically drain to the lower side. The radiators being pivoted at their sides are

unaffected by the inertia due to sudden stopping, starting or bumping of the car and simple forms of brackets and braces may be used as will be apparent from Figure 4.

For delivering heating medium to and from the radiators the pipe 13^b is connected to a cross or end pipe 13^c which terminates adjacent to one end of the pivot pipe 13^a and these two have couplings 23 and 24 to pipes 25 and 26 extending up through the bottom wall of the recess. The couplings 23 and 24 are in axial alignment and are of such character that the swinging of the radiator does not interfere with either the flow through the couplings or the tightness of the joints. If desired, the coupling 24 of the incoming pipe may have a valve so that when the radiator is in lowered position the supply of heating medium will be automatically shut off.

Beneath the car I have shown an ordinary steam pipe 26^a, from which leads a branch pipe 27 having a manually controlled shutoff valve 28 and an automatically controlled diaphragm-operated valve 29. From this pipe 27, two branches 30 and 31 extend endwise of the car to transverse connections 32 and 33, which latter are connected at their ends to the risers 26 supplying the four radiators. The outlets 25 of the two radiators at each end of the car may be connected by a transverse drain pipe 34 which may have an automatic outlet trap 35, permitting the escape of water of condensation but preventing the escape of steam. It will be noted that the drain pipes 34 are connected to the lower hinge pipes 13^b of the radiators so that the water of condensation in the radiators will automatically flow toward the lower side and to the outlet trap and the radiators will be kept properly drained.

For controlling the supply of steam to the radiators the car is provided with a means for automatically turning on and off the steam in accordance with the temperature within the car. The power for operating such control may be air taken from the air brake system of the train. I have shown the air pipe 36 with a branch connection 37 to a small storage tank 38. From the air tank 38 an air pipe 39 leads to a thermostat 40 adjacent to the upper part of the car and preferably near the door. When the temperature within the car is sufficiently high the thermostat closes this air pipe but when the temperature drops below the predetermined limit air is permitted to flow past the thermostat through a pipe 41 to the diaphragm chamber of the valve 29. By providing a check valve between the air reservoir and the source of air supply 36, the fluctuations in the air pressure due to the operation of the air brakes will not interfere with the proper operation of the ther-

mostat system. It will of course be evident that the thermostat may be of such a character as to permit the passage of air to the diaphragm of the valve 29 when the car is sufficiently warm and shut off the air when the car becomes cool thereby permitting a spring acting in opposition to the diaphragm to open the steam valve. Details of this may follow any well-known standard construction. The same air pipe line 39 may deliver through a second thermostat 43 and a pipe line 44 extending to each end of the car to dampers in the ventilators 11 and admit air to the car if the temperature in the car gets too high. The details of this mechanism are not claimed in this application but are made the subject matter of a separate application and therefore need not here be described in detail.

Having thus described my invention which I claim as new and desire to secure by Letters Patent is:

1. A freight car having a substantially flat radiator normally disposed, closely adjacent to the horizontal floor, means for pivotally supporting one portion thereof about a horizontal axis, and means for supporting another portion in raised position whereby the body of the radiator is inclined to the horizontal.

2. A freight car having a substantially flat radiator normally disposed, closely adjacent to the floor, means for pivotally supporting one portion thereof about a horizontal axis, means for supporting another portion in raised position whereby the body of the radiator is inclined and a perforated false flooring supported above and adjacent to the raised portion of the radiator.

3. A freight car having a recess in one wall thereof, a radiator having one edge thereof pivotally supported about a horizontal axis within said recess and a brace secured to another portion of said radiator and adapted to support the latter when moved out of said recess.

4. A freight car having a recess in one wall thereof, a radiator having one portion piv-

oted about a horizontal axis within said recess, and a brace pivotally secured to another portion of said radiator whereby the latter portion may be moved into or supported outside of said recess with the radiator inclined.

5. A freight car having a substantially flat radiator normally disposed, closely adjacent to one wall thereof, pivotal support for one edge of said radiator and a bracket pivotally secured to the opposite edge for supporting said radiator in raised inclined position.

6. A freight car having a substantially flat radiator normally disposed, closely adjacent to one wall thereof, a pivotal support for one edge of said radiator, a bracket pivotally secured to the opposite edge for supporting said radiator in raised inclined position, and supply and exhaust pipe connections to said radiator in axial alignment with said pivotal support.

7. A freight car having a radiator therein, means for pivotally supporting one edge of said radiator, means for supporting the opposite edge adjacent to or spaced from the floor of the car with the radiator in inclined position, a supply conduit and an exhaust trap beneath the floor of the car and connections to said radiator in axial alignment with the pivotal center of said radiator.

8. A freight car having a recess in the floor thereof, a substantially flat radiator formed of parallel pipe sections normally disposed within said recess, a pivotal support within said recess for one edge of the radiator whereby the opposite edge of the radiator may be swung upwardly about an axis parallel to said pipe sections and to inclined position, a perforated false floor spaced above said first mentioned floor, and means for supporting said radiator in inclined position with the upper edge adjacent to said false floor.

Signed at New York city, in the county of New York and State of New York, this 8th day of October A. D., 1919.

ALFRED LEE MOORSHEAD.