

FREIGHT CAR.

Patented July 13, 1915.

5 SHEETS—SHEET 1.

Witnesses

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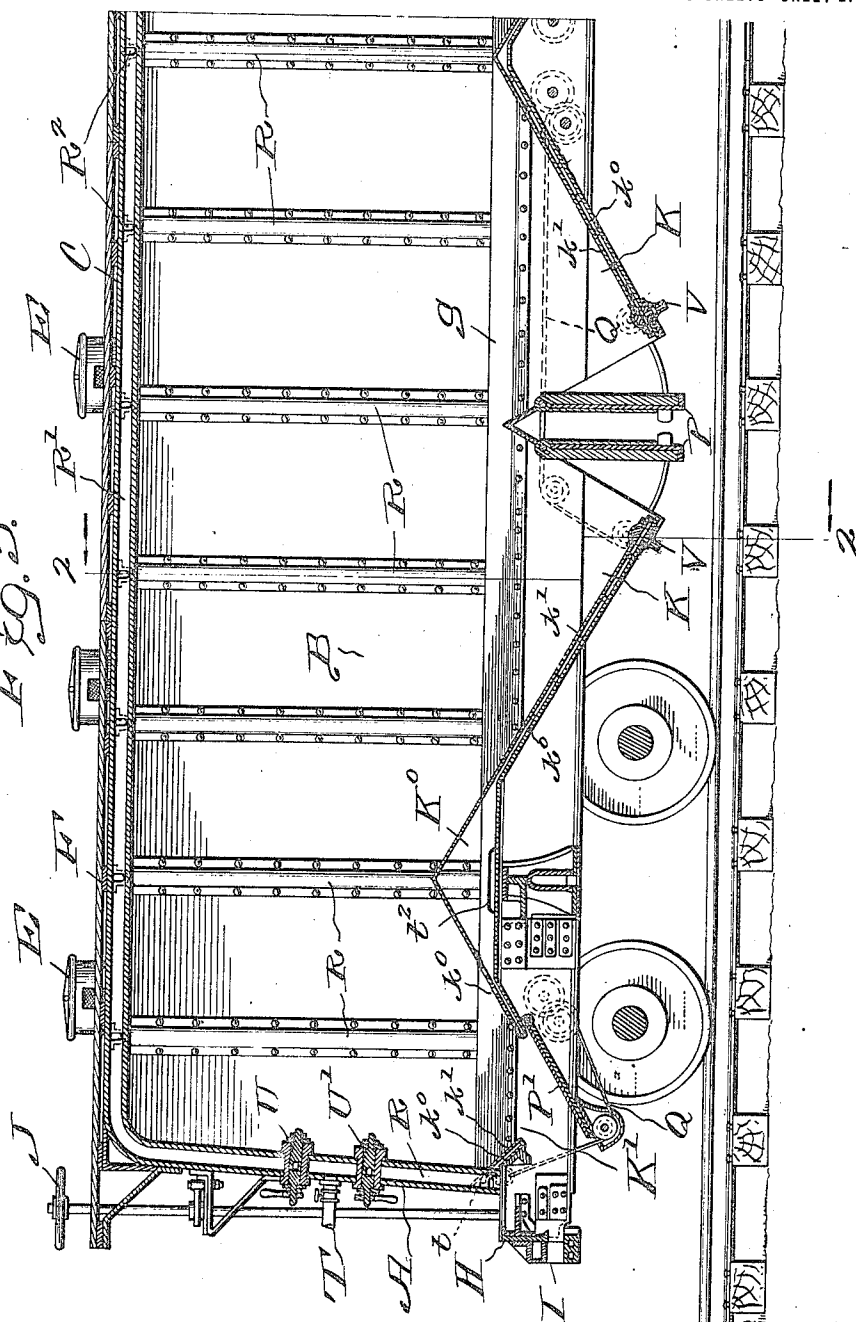
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5 SHEETS—SHEET 2.

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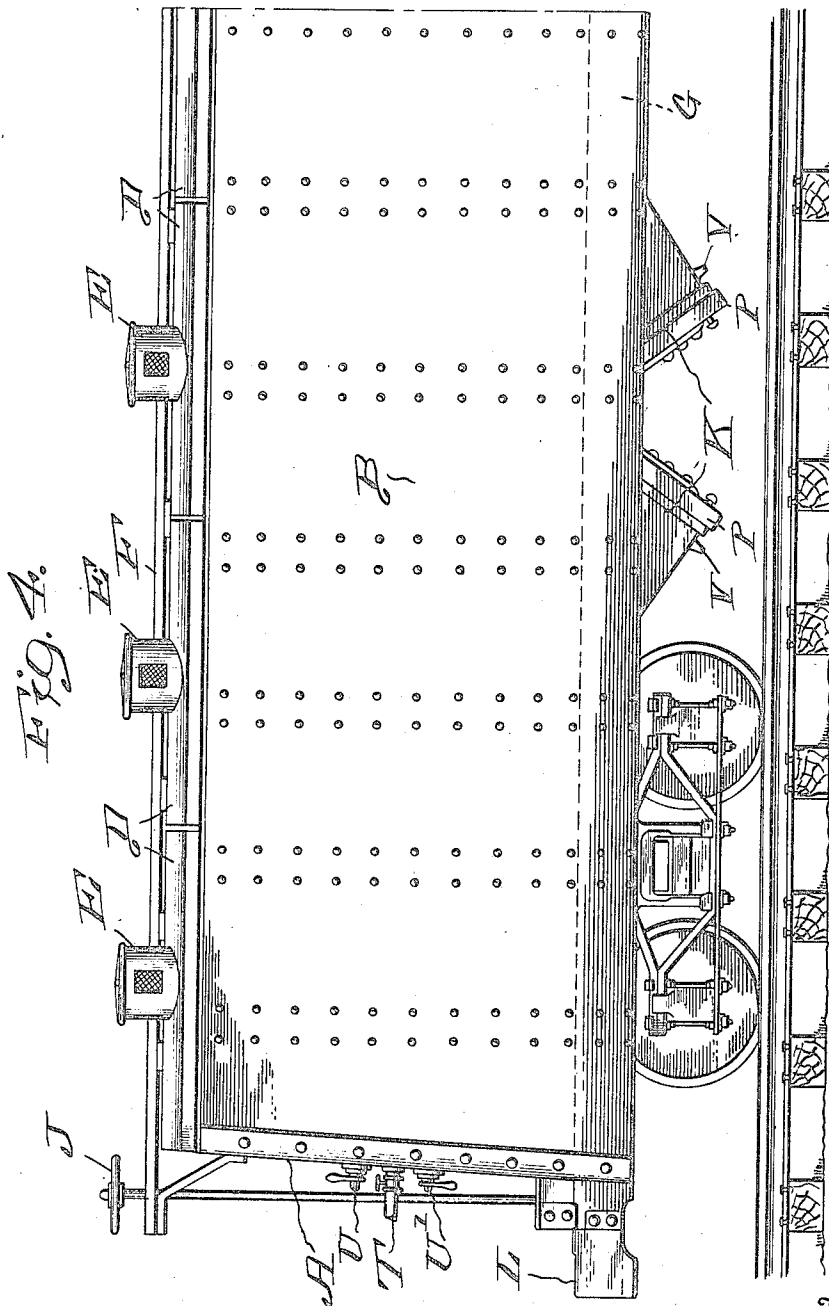
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APPLICATION FILED JUNE 2, 1914.

1,146,728.

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5 SHEETS—SHEET 3.



Witnesses
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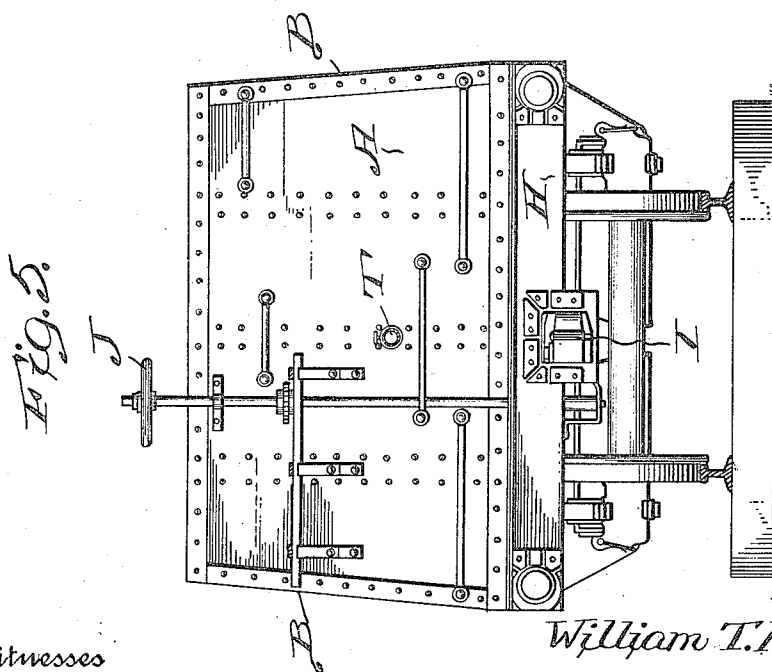
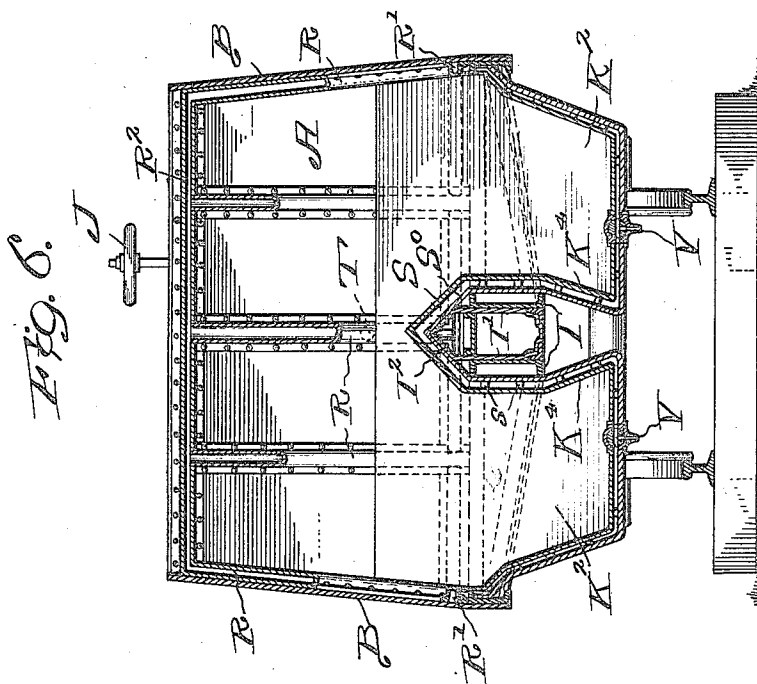
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5 SHEETS—SHEET 4.



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FREIGHT CAR.

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5 SHEETS—SHEET 5.

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UNITED STATES PATENT OFFICE.

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FREIGHT-CAR.

1,146,728.

Specification of Letters Patent.

Patented July 13, 1915.

Application filed June 2, 1914. Serial No. 842,415.

To all whom it may concern:

Be it known that I, WILLIAM T. MANNING, a citizen of the United States, residing at Govans, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Freight-Cars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to improvements in the construction of freight cars, and it consists in providing a car especially adapted to be emptied cheaply and economically, and also to furnish at the same time a reduced resistance to atmospheric pressure on the moving car, and to render the car more immune from injury from side-wipes. It is well known that in the present types of metal cars, especially the open cars carrying coal and ore, there is a chemical action between the material loaded in the car and the metal sides of the car, causing the formation of cake or scale, not only eating into the walls of the car, but also rendering it difficult to clean said sides, and also preventing the free passage downward of the load in the car when the hoppers are open. This is especially true when the coal or ore is wet, as from rain or snow. The difficulty of unloading the car is enormously increased when the coal or ore after becoming wet is subsequently frozen in the car, when it has to be dug out with picks or thawed out, or both.

According to my invention, I provide a form of car body, having ends and sides inclined upward and inward, so as to allow the contents of the car to fall away from the sides and ends thereof readily by gravity, and in order to thaw the contents of the car when desired I shift the hollow tubular bracing on the sides of the car from the outside to the interior thereof, and I connect the same to suitable passages provided over the beams and in the hoppers at the bottom of the car; the whole forming a steam space into which steam may be admitted from the engine, or from any other convenient source of supply. In this way the already existing parts of the car are utilized, with or without slight modifications, to constitute a steam reservoir into which steam may be turned, and which will effectually heat the

material in the interior of the car and quickly thaw out same when the former is frozen.

Incident to removing the tubular bracing from the exterior to the interior of the car, the plane sides of the car do not offer such projecting surfaces to wind pressure when the car is in motion as if this bracing were on the exterior of the car, while at the same time the sloping ends of the car will tend to deflect the air upward when the car is in motion, causing a still further decrease of wind resistance. Furthermore, by having the sides of the car plane there will be no projecting ribs to strike, or be struck by a train, or objects protruding on adjacent tracks, and the car is less liable to injure or to cause injury from side-wipes, which are a frequent source of trouble in railroad-ing. Furthermore, the shifting of the side braces to the interior of the car will enable the side walls of the car to be spaced farther apart, or the interior of the car body widened; without increasing the prescribed overall width of the same. This will materially increase the cubical capacity of the car, and hence will enable the car to carry larger loads, or to be decreased in height if it be desired not to increase the cubical contents of the car. The decrease in height will, of course, lower the center of gravity of the car body and its load. Thus in a train of 40 cars, the removal of the braces from the inside to the outside would effect a saving of about 5200 cubic feet, or the capacity of two whole cars on said train, or about 5 per cent.

As an incident to the sloping ends and sides of the car body, these may be much more readily kept clean, or cleaned off, if used with coal or ore, and the car is thus especially adapted for use with clean return freight, such as grain, or the like.

My invention will be understood by reference to the accompanying drawings, in which similar parts are indicated by similar reference symbols throughout the several views.

Figure 1 is an end view of a covered car constructed according to my invention; Fig. 2 shows a cross section of the same, the section being along the line 2-2 of Fig. 3, and looking in the direction of the arrows; Fig. 3 shows a central vertical section through one half of the car shown in Figs. 1 and 2,

parts being shown in elevation, the section being along the broken line 3—3 of Fig. 2, but the hopper doors being shown open; Fig. 4 is an exterior view of that portion of the car shown in Fig. 3; Fig. 5 is an end view of an open car constructed according to my invention; Fig. 6 shows a cross section of the same along the line 6—6 of Fig. 7, and looking in the direction of the arrows; Fig. 7 shows one end in elevation, and the other end in central vertical section through the car body of Figs. 5 and 6; and Fig. 8 shows a section along the line 8—8 of Fig. 7, and shows a plan view of the bottom of the car body with the hoppers, heating chambers, etc.

Referring first to Figs. 1—4, showing a covered car constructed according to my invention, A, A represent the ends of the car, and B, B the sides thereof, which ends and sides are inclined slightly inward toward the axis of the car, or tumble home, thus forming a slanting structure from which any load in bulk in the car, such as coal, ore, grain, or the like, would tend to fall away and thus tend to facilitate the unloading of the car, and also to facilitate the keeping of the inner walls clean.

The top C of the car is provided with a series of doors, or covers, D hinged, as at d , and each door, or cover, may be provided with one or more ventilators E, if desired, or these ventilators may be dispensed with, if desired.

Mounted on the top of the car is the usual running board F. The base of the car body is provided with the usual side sills G and end sills H, and with the usual central sill, or beam, I, see Fig. 2, which is inclosed in the casing I' with a tapered cap I², as will be hereinafter more fully described.

The car is preferably provided with the usual hand wheel J and parts controlled thereby, for applying the brakes by hand, and with any suitable coupler L.

Each end of the car may be provided with an opening M^o, covered by a sliding door M, which slides on the frame m , and may be raised or lowered by the rope or chain m' winding over the pulley m^2 , which may be turned in any convenient way.

In the half of the car shown in Figs. 1—4, I provide a single hopper K with end pockets K', closed by swinging doors P and P', respectively, as shown most clearly in Fig. 3. These doors may be closed in any convenient way, as by means of the ropes, or chains, Q, passing over the pulleys shown diagrammatically in Fig. 3. These hoppers preferably extend entirely across the bottom of the car, as shown in Fig. 2.

In the construction of the car, I use hollow braces R, extending vertically along the inside of the sloping car walls A and B, and having air passages in the hollow portions

thereof connected to similar passages in the longitudinal braces R' at the side of the car, see Fig. 2, and also with the transverse braces R² at the top of the car, see Fig. 2; thus forming a series of steam chambers which are ordinarily filled with air. Similar steam spaces k^o are provided by placing a false bottom k' in the hoppers, and all of these steam spaces so provided are connected together and to the steam spaces S^o, between the casing I', I² surrounding the central sill of the car and the outer casing S which is spaced therefrom as by suitable spacers s , as shown in Fig. 2. Similar spaces k^2 separate the inner and outer bottoms of the hoppers, as shown most clearly at the bottom of Fig. 2.

At the ends of the hoppers are large chambers K^o, as shown most clearly in Fig. 3. Steam may be applied to the connected group of steam chambers just described in any convenient way, as through the pipe T opening into one of the hollow spaces forming the steam chamber. I have shown such a pipe T in Fig. 3 connected to one of the hollow braces at the end of the car with valves U and U', controlling the flow of the steam either up or down, as may be desired, in the hollow brace.

Suitable drain cocks V are provided at the bottom of the car, as shown in Figs. 2, 3 and 4, to draw off the condensed water from the bottom of the car, and also to let out the air when it is desired to blow in steam. Thus it will be seen that I provide a series of inter-connected steam chambers on the interior of the car body, all of which may be filled with a heating medium, such as steam from the locomotive, or any other source, and thus the interior of the car may be readily heated for the purpose of thawing out the load in the car, or for preventing the same from freezing.

It will be obvious that instead of a heating fluid, such as steam, any convenient cooling fluid may be used, such as compressed air, if desired, which cooling fluid may be allowed to expand into the hollow spaces in the sides, bottom and framework of the car body, thus cooling the interior of the car.

It will be obvious that the pipe T could be connected to any suitable source of heating or cooling fluid, such as the boiler of a locomotive, or any stationary heating or cooling plant.

In the form of device shown in Figs. 5, 6, 7 and 8, the top of the car body is open, and the hollow tubular framing runs along the sides and bottom thereof, in a vertical and horizontal direction, as has already been described; there are also hollow spaces between the inner and outer bottoms of the hoppers, and also above the longitudinal and transverse sills. In this form of de-

vice, instead of having a single hopper extending entirely across the car, separate hoppers K^2 on each side of the car are shown, with two pockets K^3 at each end, which
 5 hoppers and end pockets are closed by doors P and P' similar to those already described. In order to facilitate the dumping of the load through these hoppers K^2 when the doors are open, the inner walls of the hoppers are preferably inclined downward and
 10 inward toward the center of the car, as shown at K^4 in Fig. 6. The transverse sills are covered with hollow, inverted, V-shaped caps S^3 , as shown in Fig. 8, and the air
 15 spaces beneath these are connected to the air spaces beneath the cap S mounted above the longitudinal central sill I , as shown in Fig. 6. With this arrangement the steam when applied will go through the hollow
 20 bracing along the sides and ends of the car, and especially in the hollow spaces in the bottom of the car and above the longitudinal and transverse sills, thus providing a large heating area which will promptly
 25 thaw out any ice formed in the coal, ore, or the like, contained in the car.

It will be noted that the material carried in the car will tend to freeze more quickly at the sides and bottom, and thus the heat
 30 is applied at the desired points, while the condensed water from the steam is drained off from the bottom of the car, as previously explained.

In using the heating arrangement herein described, it would, of course, be desirable, when the steam is turned on, to allow the air to escape through the cocks V , and thus facilitate the admission of the steam to the entire heating space.

40 It will thus be seen that I describe a car body whose sloping ends and sides, and the construction of whose hoppers will greatly facilitate the unloading of material shipped in bulk therein, such as coal, ore, grain, or the like, and that by the herein described arrangement of heating or cooling medium, the interior of the car may be heated or cooled as may be desired.

50 It will also be noted that the cars constructed according to my invention are less liable to be impeded by wind pressure, and are less likely to be injured from side wipes; furthermore by having the sides and ends of the car tumbled home, as described, the center of gravity of the load is thrown lower down, and there is less tendency of the cars to topple over from the usual well known causes.

60 It will also be noted that the herein described cars include the various advantages of modern metallic car construction with the various advantages already set out; but at the same time contain no features which would incur any heavy additional expense in construction, or would involve impracticable de-

tails, such as are generally found in attempts to materially modify existing commercial structures of the character described.

While my invention is best carried out in metal car bodies, it will be obvious that with
 70 wooden car bodies, using hollow metal framework or bracing, the hollow portions of the frame may be connected together to form a continuous cooling or heating chamber, as has been fully described with refer-
 75 ence to metal cars.

It will be obvious that various modifications might be made in the herein described apparatus, and in the construction, combination and arrangement of parts which could
 80 be used without departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:—

85 1. A car body having its sides inclined upward and inward so as to slightly overhang the interior of the car body, the said car body being provided with hollow bracing mounted on the inside thereof, the hollow spaces of said bracing being connected
 90 together to form a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

95 2. A car body having its sides and ends inclined upward and inward so as to slightly overhang the interior of the car body, the said car body being provided with hollow bracing mounted on the inside thereof, the hollow spaces of said bracing being connected together to form a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

105 3. A car body having its sides and ends forming the frustum of a rectangular hollow pyramid, the said car body being provided with hollow bracing mounted on the inside thereof, the hollow spaces of said bracing being connected together to form a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as and for the purposes described.

115 4. A car body having its sides inclined upward and inward so as to slightly overhang the interior of the car body, the said car body being provided with hollow bracing mounted on the inside thereof, the hollow spaces of said bracing being connected together to form a continuous heating or cooling chamber, and the longitudinal and transverse sills of said car body being provided with hollow caps forming air spaces
 120 connected to the air spaces in the hollow framing, with means for supplying fluid to said chamber, substantially as described.

5. A car body having its sides and ends inclined upward and inward so as to slightly
 130

overhang the interior of the car body, the said car body being provided with hollow bracing mounted on the inside thereof, the hollow spaces of said bracing being connected together to form a continuous heating or cooling chamber, and the longitudinal and transverse sills of said car body being provided with hollow caps forming air spaces connected to the air spaces in the hollow framing, with means for supplying fluid to said chamber, substantially as described.

6. A car body having its sides and ends forming the frustum of a rectangular hollow pyramid, the said car body being provided with hollow bracing mounted on the inside thereof, the hollow spaces of said bracing being connected together to form a continuous heating or cooling chamber, and the longitudinal and transverse sills of said car body being provided with hollow caps forming air spaces connected to the air spaces in the hollow framing, with means for supplying fluid to said chamber, substantially as described.

7. A dumping car body having its sides inclined upward and inward so as to slightly overhang the interior of the car body, the said car body being provided with hollow bracing mounted on the inside thereof, and with hoppers having false bottoms therein with air chambers beneath said false bottoms, the hollow spaces of said bracing and said air chambers beneath the hoppers being connected together to form a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

8. A dumping car body having its sides and ends inclined upward and inward so as to slightly overhang the interior of the car body, the said car body being provided with hollow bracing mounted on the inside thereof, and with hoppers having false bottoms therein with air chambers beneath said false bottoms, the hollow spaces of said bracing and said air chambers beneath the hoppers being connected together to form a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

9. A dumping car body having its sides inclined upward and inward so as to slightly overhang the interior of the car body, the said car body being provided with hollow bracing mounted on the inside thereof, and with hoppers having false bottoms therein with air chambers beneath said false bottoms, and the longitudinal and transverse sills of said car body being provided with hollow caps forming air spaces connected to the air spaces in the hollow framing, and to those beneath the hoppers, forming a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

10. A dumping car body having its sides and ends inclined upward and inward so as to slightly overhang the interior of the car body, the said car body being provided with hollow bracing mounted on the inside thereof, and with hoppers having false bottoms therein with air chambers beneath said false bottoms, and the longitudinal and transverse sills of said car body being provided with hollow caps forming air spaces connected to the air spaces in the hollow framing, and to those beneath the hoppers, forming a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

11. A dumping car body having its sides and ends forming the frustum of a rectangular hollow pyramid, the said car body being provided with hollow bracing mounted on the inside thereof, and with hoppers having false bottoms therein with air chambers beneath said false bottoms, and the longitudinal and transverse sills of said car body being provided with hollow caps forming air spaces connected to the air spaces in the hollow framing, and to those beneath the hoppers, forming a continuous heating chamber, with means for supplying steam to said chamber, and for drawing off the water of condensation therefrom, substantially as described.

12. A car body provided with hollow bracing mounted on the inside thereof, the hollow spaces of said bracing being connected together to form a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

13. A car body provided with hollow bracing mounted on the inside thereof, the hollow spaces of said bracing being connected together to form a continuous heating chamber, with means for supplying steam to said chamber, substantially as described.

14. A car body provided with hollow bracing mounted on the inside thereof, the hollow spaces of said bracing being connected together to form a continuous heating chamber, with means for supplying steam to said chamber, and means for drawing off the water of condensation therefrom, substantially as and for the purpose described.

15. A car body provided with hollow bracing mounted on the inside thereof, and the longitudinal and transverse sills of said car body being provided with hollow caps forming air spaces connected to the air spaces in the hollow framing, the whole forming a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

16. A car body provided with hollow bracing mounted on the inside thereof, and the longitudinal and transverse sills of said car body being provided with hollow caps form-

ing air spaces connected to the air spaces in the hollow framing, the whole forming a continuous heating chamber, with means for supplying steam to said chamber, and means for drawing off the water of condensation therefrom, substantially as described.

17. A dumping car body provided with hollow bracing mounted on the inside thereof, and with hoppers having false bottoms therein with air chambers beneath said hollow bottoms, the hollow spaces of said bracing being connected together and to said space beneath said false bottom to form a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

18. A car body provided with hollow bracing mounted on the inside thereof, and with hoppers having false bottoms therein with air chambers beneath said hollow bottoms, the hollow spaces of said bracing being connected together and to said space beneath said false bottom to form a continuous heating or cooling chamber, with means for supplying steam to said chamber, and means for drawing off the water of condensation therefrom, substantially as and for the purposes described.

19. A car body provided with hollow bracing mounted on the inside thereof, and with

hoppers having false bottoms therein with air chambers beneath said hollow bottoms, and the longitudinal and transverse sills of said car body being provided with hollow caps forming air spaces connected to the air spaces in the hollow framing and to said space beneath said false bottom, the whole forming a continuous heating or cooling chamber, with means for supplying fluid to said chamber, substantially as described.

20. A car body provided with hollow bracing mounted on the inside thereof, and with hoppers having false bottoms therein with air chambers beneath said hollow bottoms, and the longitudinal and transverse sills of said car body being provided with hollow caps forming air spaces connected to the air spaces in the hollow framing and to said space beneath said false bottom, the whole forming a continuous heating chamber, with means for supplying steam to said chamber, and means for drawing off the water of condensation therefrom, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

WILLIAM T. MANNING.

Witnesses:

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