E. H. GOLD.

RAILWAY CAR.

APPLICATION FILED MAR. 2, 1909.

1,008,324.

Patented Nov. 14, 1911.

4 SHEETS—SHEET 1.

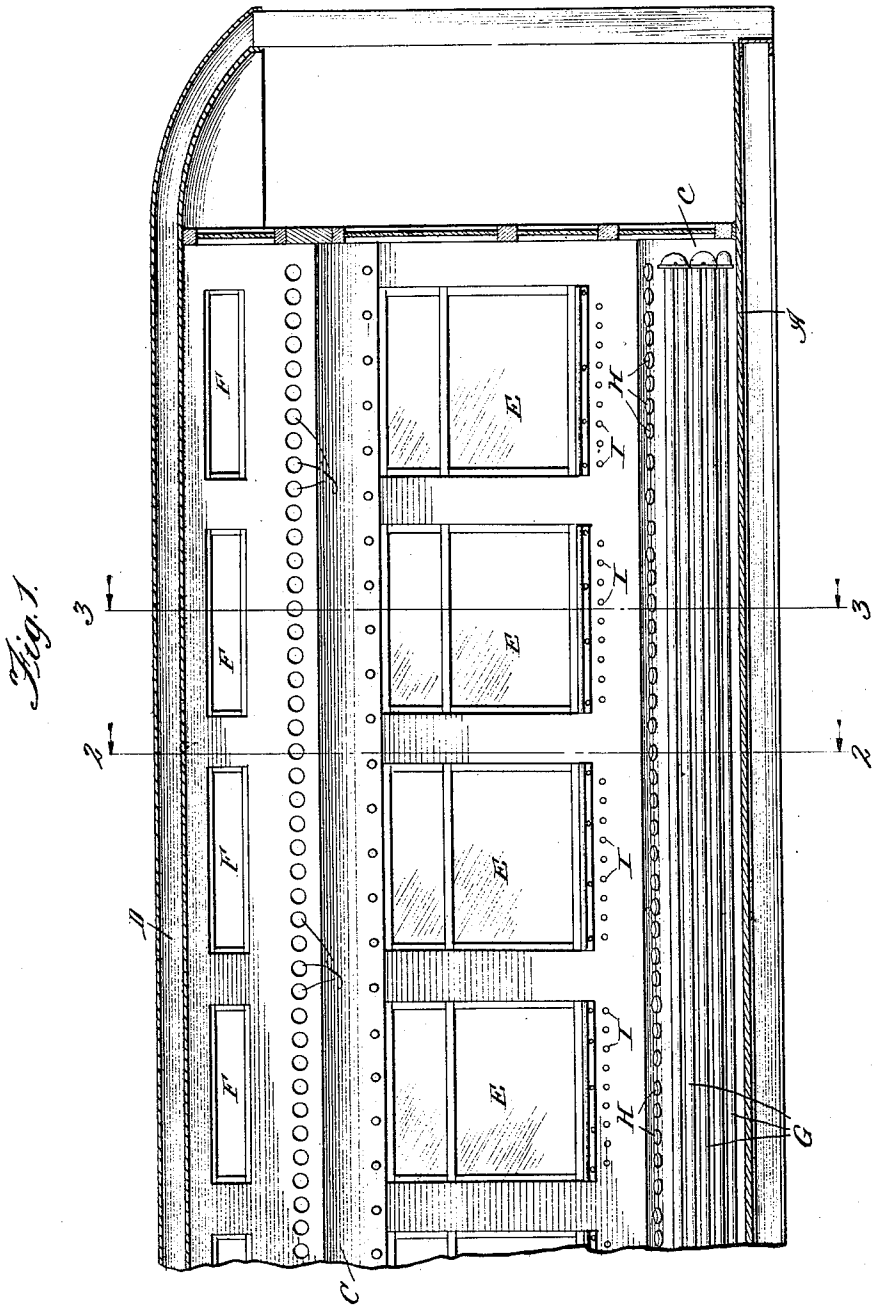

Fig. 1.

Witnesses:

Inventor:

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4 SHEETS—SHEET 2.

Fig. 3.

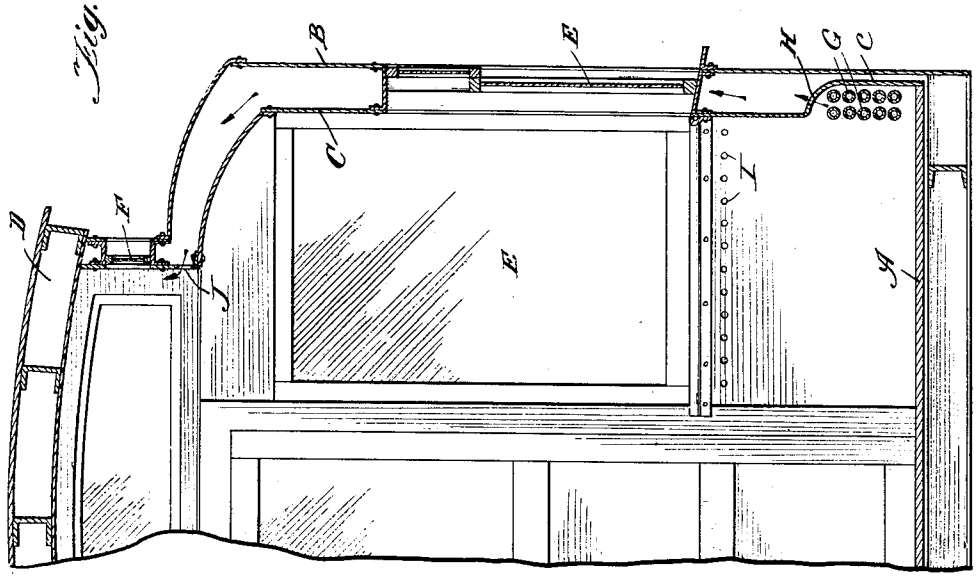
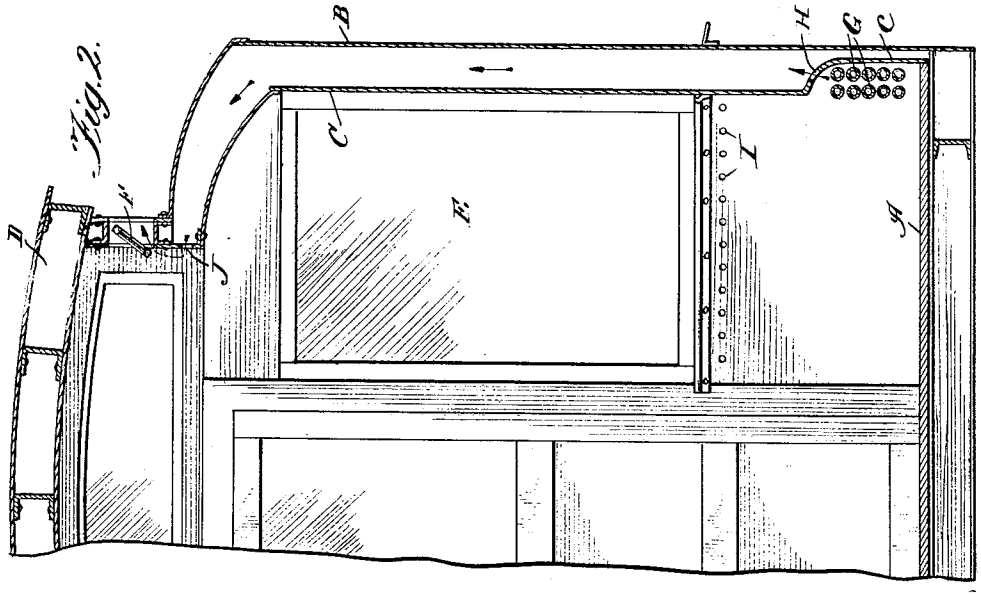


Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 5.

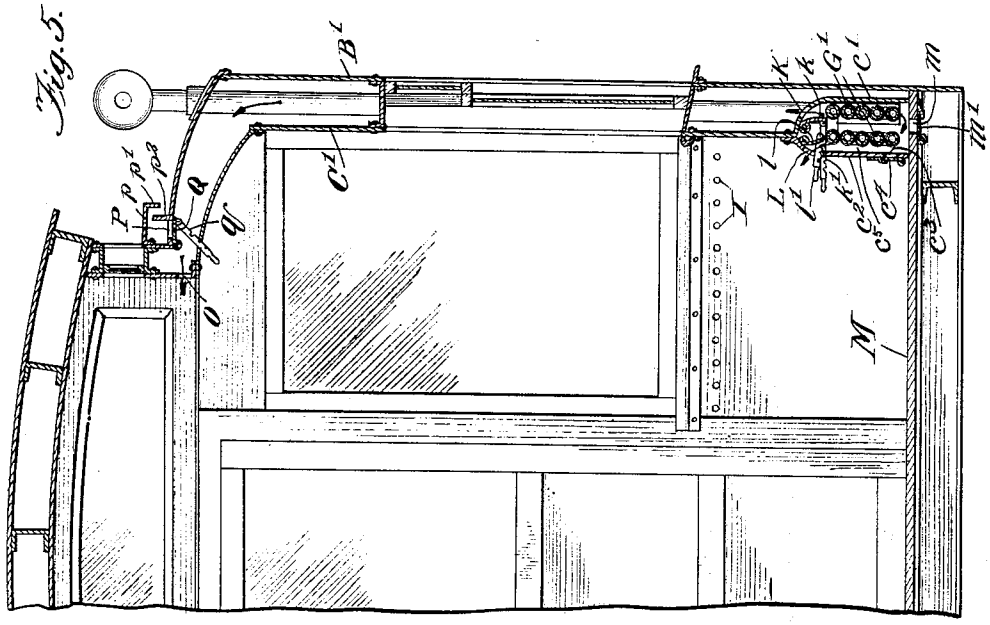
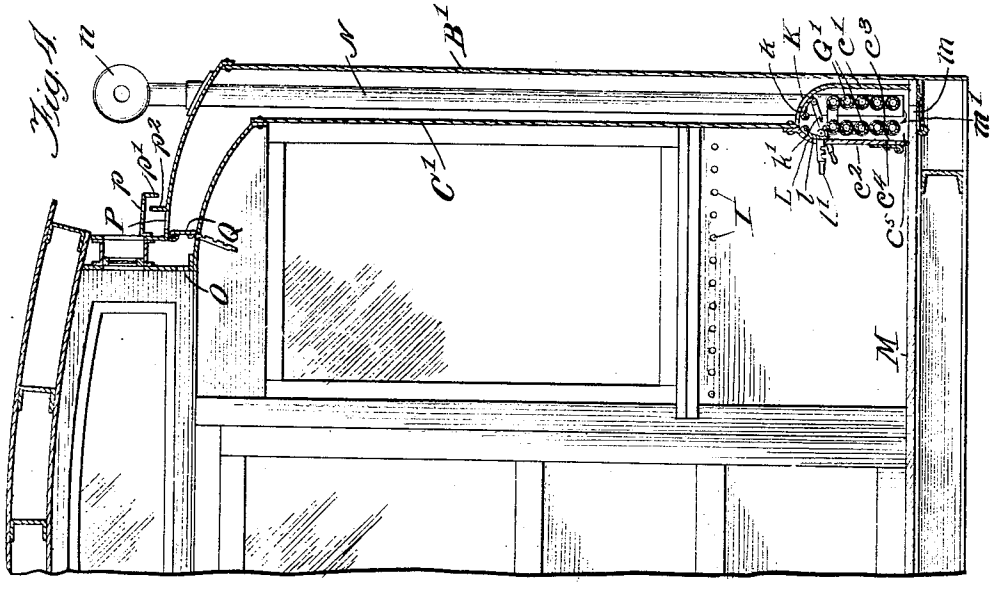


Fig. 4.



Witnesses:

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4 SHEETS—SHEET 4.

Fig. 6.

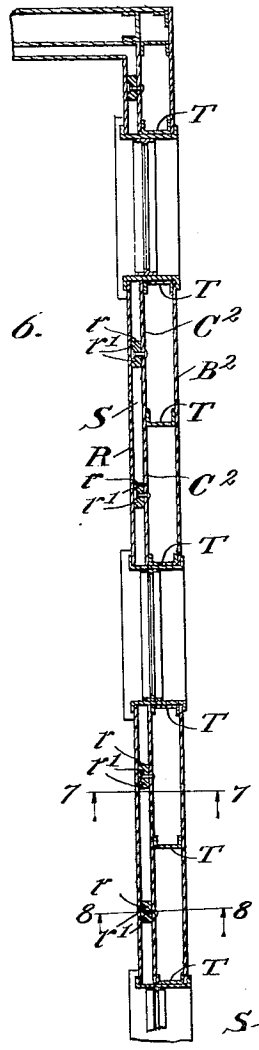
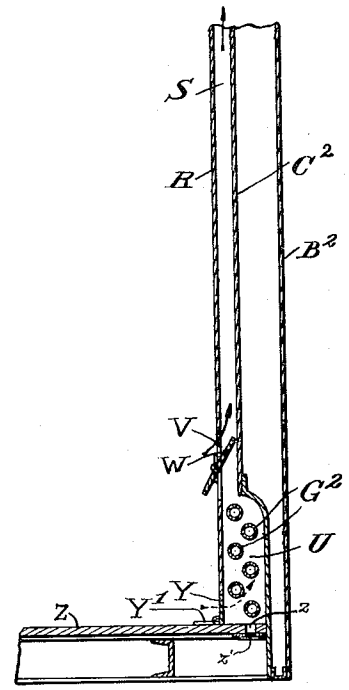


Fig. 7.



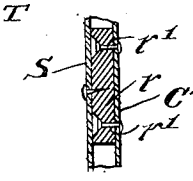


Fig. 8.

Witnesses:

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UNITED STATES PATENT OFFICE.

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RAILWAY-CAR.

1,008,324. Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed March 2, 1909. Serial No. 480,866.

To all whom it may concern:

Be it known that I, EGBERT H. GOLD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railway-Cars, of which the following is a specification.

My invention relates to railway cars and in particular to cars having the side walls constructed of sheet metal; and the invention has for its object to so construct said walls and to arrange the heating devices of the cars in such a way as to keep the inner surfaces of such walls from becoming very cold in winter time; the arrangement provided for this purpose being such as to keep the same surfaces of the cars from being excessively heated in summer time when out in a hot sun.

Steel cars are ordinarily constructed with double walls made of relatively thin sheets or plates of steel, the walls being separated by an air space, in which is the supporting frame-work of beams and struts, which support the walls and roof. In spite of this air space, the effect of which is partly nullified by the frame-work which connects the inner and outer plates and conducts heat from one to the other, the inner walls of such cars get very cold during cold weather, this being due to the fact that steel is an excellent conductor of heat. In extremely cold weather, the inner surfaces of the side walls of steel cars are often so cold to the touch as to be very disagreeable. In sleeping cars this is particularly undesirable.

My present invention has for one object to provide means for circulating hot air between the inner and outer side walls of the car, so as to keep the inner wall relatively warm.

The invention can be embodied in various different structures. For example, I may perforate the inner wall of the car and locate such heating devices as are ordinarily used to heat the car, as, for instance, the radiating pipes of the steam heating system, beneath these perforations, so that a certain amount of heat passes between the steel walls of the car, perforations being provided above these perforations in one of the walls, so that a circulation is established. The radiating pipes may also be inclosed in air trunks which communicate with the spaces between the inner and outer walls and which trunks may be fed with fresh air from outside in a variety of ways. The car may also be constructed with a second inner wall and the space so inclosed used for the purpose specified.

It will be seen that these constructions also afford means for lessening the amount of heat which passes through the walls of the car when it is exposed to very hot sunshine. One of the great objections to the use of steel passenger cars is that the inner walls become excessively hot in warm weather. With an air space provided between the inner and outer walls and with an inlet thereto and an outlet therefrom, a circulation may be maintained along the inner wall which prevents it from becoming so hot as is otherwise the case.

It will thus be seen that my invention provides means for so neutralizing the influence of heat and cold on the exterior of the car as to temper the inner surface of the car and keep it at all seasons at a temperature which is not objectionable, by which is meant a temperature which is not uncomfortable for a passenger to come in contact with.

Preferred forms of car construction illustrating different embodiments of my invention are shown in the accompanying drawings, in which—

Figure 1 is a longitudinal section through one end of a passenger car, unessential parts being omitted for the sake of clearness. Fig. 2 is a cross-section on line 2—2 of Fig. 1. Fig. 3 is a cross-section on line 3—3 of Fig. 1. Figs. 4 and 5 are similar views illustrating a modified construction. Fig. 6 is a sectional plan of a portion of a car illustrating a further modification; Fig. 7 is a vertical section on line 7—7 of Fig. 6, looking in the direction of the arrows; and Fig. 8 is a section on line 8—8 of Fig. 6.

Like characters of reference indicate like parts in the several figures of the drawings.

Referring first to Figs. 1 to 3, A represents the flooring of the car, B the outer steel wall, which may be constructed in any desired manner, C the inner wall, D the roof, E the windows of the car, and F the transoms, of any desired construction, in the upper part of the car. As the construction of cars of this sort is familiar, I have not shown and described parts which are unessential to the understanding of my invention. Ordinarily there will have to be various braces and struts between the walls B and C, but these are not shown, as

they would add unnecessary details to the drawings. Preferably the wall C is curved inwardly at c, forming a recess in which are located the radiating pipes G. The wall above the radiating pipes is formed with a series of perforations H, through which the hot air from the radiating pipes enters the air space between the inner and outer walls. In order to provide for the circulation of the air between the walls, one or the other of the walls B, C is provided with perforations above perforations H. Preferably wall C has a series of perforations I below each of the windows E. The hot air, entering openings H, passes along the part of the wall below the windows, which is the part the passenger is likely to come into contact with, and reënters the car through openings I. These openings being located directly below the windows, the result is that a film of relatively hot air is spread out in front of the windows, supplying heat at these places, where the radiation and escape of heat is greatest. Preferably openings are also provided near the roof of the car. For example, I may provide a series of openings J into the car just below the transoms F.

In summer time the sun beating down on the roof and sides of the car will cause a circulation of air between walls B and C tending to keep the inner wall cool. When transoms F are open, the rising current of air from between walls B and C passes immediately out of the car.

In Figs. 4 and 5 I have illustrated a modified form of car construction embodying the same general features of my invention. The construction of the walls of the car is substantially the same as shown in the preceding figures, the side walls consisting of outer and inner steel sheathings B′, C′. The inner sheathing is preferably in like manner recessed at c'. The steam pipes G′ are in this case inclosed by a sheathing c^2 which, with the recessed part c' and the sheathing of the car, constitutes an air trunk c^5 for the steam pipe running along the side of the car. This air trunk might be constructed in any other manner. The recessed wall c' is perforated, as at K, forming an inlet for air to the space between walls B′, C′, which inlet is closed by a shutter k provided with an adjusting handle k'. The sheathing c^2 has the opening L controlled by shutter l having the adjusting handle l'. I preferably provide means for introducing air from outside of the car into the air trunk c^5. The flooring of the car M may have the opening m which may be closed by the valve m'. In this way air is introduced into the trunk from below the car. Preferably, however, I provide an air intake pipe N which extends up through the roof of the car and has the hood n. By this means air may be forced into the air trunk by the motion of the car. I may also provide openings c^6 in the lower part of sheathing c^2, closed by shutter c^4 by means of which air may be taken from the inside of the car when desired.

In the construction of Figs. 4 and 5, the air chamber between the inner and outer walls may be put into communication either with the interior of the car or directly with the outside air at the upper part of the car. An opening O is provided between the air chamber and the interior of the car and another opening P is formed in the roof of the car. This opening is preferably protected from rain by the horizontal flange p and the vertical flanges p', p^2. Any other means might be employed for protecting the opening or openings in the roof of the car. A flap valve Q having an operating handle q directs the circulation between walls B′, C′ either through opening O into the car or through opening P outside of the same.

The arrangements shown in Figs. 4 and 5 permit a regulatable amount of hot air to be circulated through the walls of the car and permit also the regulation of the amount of heat which comes out directly into the car. In winter time the air which is thus heated may be air from the inside of the car or it may be fresh air taken from outside of the car. In summer time the air may be taken into the air trunks in the same manner and its circulation through the walls of the car tends to reduce the high temperature produced in the steel inner sheathing by the sun's rays.

In Figs. 6 and 7 I have shown a further modification. The relatively thin inner and outer steel sheathings in cars of steel construction are braced and strutted by various steel beams and struts. Steel beams and trusses are also necessary to support the roof of the car and all this steel work is inclosed by the inner and outer sheathings. This frame-work being in contact with the inner and outer steel walls, in winter time forms a good conductor for the heat in the inner walls, causing it to be conducted away and dissipated. The steel frame-work, therefore, plays a part in keeping the inner wall uncomfortably cold in winter and likewise in making it hot in summer. In order to further raise the temperature of the inner surface of the wall in winter time and to lessen its temperature in summer, I may provide an air chamber or passage-way for air which is practically free from the main supporting frame-work of the walls or only in contact with the same at a few points; and the necessary points of contact may be insulated. This may be accomplished by providing a third sheathing inside of the other inner sheathing and circulating air through the passage-way so formed. This

construction is advisable also where the frame-work between the ordinary outer and inner sheathings is such as to impede the circulation of air between the same. I have shown a construction of this sort in Figs. 6 and 7, in which inside the outer and inner walls B^2 C^2 there is an inner steel sheathing R forming a chamber or passage-way S for the circulation of hot or cold air, as the case may be. The supporting frame-work of the wall is indicated at T. The inner sheathing R does not carry any great strain and, therefore, it is sufficiently supported and braced by relatively light bracing members which are preferably in staggered relation with the parts of frame-work T in contact with the inner wall C^2. For example, upright strips r of wood, fiber composition, asbestos or other poor conductors of heat may be fastened to wall C^2 by bolts r' having counter-sunk heads so as to be out of contact with sheathing R and the sheathing may be screwed or otherwise secured to these strips. In this way I provide an air chamber or passage-way for the circulation of air in contact with the inner surface of the wall which is practically free from any heavy steel work that would serve as a conductor of heat between the inner surface of the wall and the external parts of the wall, such supports or braces as come into contact with the inner sheathing being small and light and arranged out of line with the main frame-work of the wall. An air trunk U may be formed in the lower part of the car for the radiating pipes G^2, which air trunk may be fed with air in any desired manner. The sheathing R may be provided with an opening V, in which is a shutter W apportioning the heat between chamber S and the car. If desired, the sheathing R may be perforated at Y and a valve Y′ provided for such perforations, whereby air from the car may be admitted to the air trunk U or this circulation shut off, as desired. The floor Z of the car may be formed with a port z controlled by a damper z', so that air may be taken into the air trunk U from outside the car if desired.

I do not claim herein specifically the arrangements and constructions shown in Figs. 6 to 8 inclusive, the inventions specific to this construction of car being claimed in my co-pending application Serial No. 539,784 filed January 24, 1910, which is a division hereof.

I do not limit myself to the particular devices, constructions and arrangements shown, as modifications might be devised which would come within my invention as defined by the claims herein. The several figures show different constructive details. It is obvious that these details of construction might be combined in various different ways.

In the arrangements shown, particularly in Figs. 4 and 5, I have provided means for taking the air which is introduced into the air trunk and then into the air space between the walls, either from outside of the car or from the interior of the car as may be desirable and expedient. I have also provided means, whereby the upper part of the air space may be put into communication, either with the atmosphere outside of the car or with the interior of the car. In very cold weather, for instance, it may be desirable to take the air which is to be introduced into the air space from the interior of the car rather than from outside of the car, at least, until the heating system has gotten well under way, because air taken directly from without the car might be so cold as not to be sufficiently heated by contact with the radiating pipes. In very cold weather it will be found desirable not to allow the heat in the air space to be wasted by escaping through the openings P. In such case, the current of air passing through the air space may be directed back into the car. When the air space is performing its other function, that is, the function of keeping the inner wall of the car cool, fresh cold air may be taken into the trunk from outside the car, and the heated air from the air space discharged through the openings in the top of the car.

I claim:

1. A railway car constructed with inner and outer metal walls having between them an air space, in combination with means for putting the lower part of said air space into communication either with the atmosphere outside the car or with the interior of the car as desired, said walls being provided with openings at the upper part of said air space, whereby air may be taken either from outside the car or from inside the car, as desired, and circulated between said walls, substantially as and for the purposes described.

2. A railway car constructed with inner and outer metal walls having between them an air space in combination with means for putting the lower part of said air space into communication either with the atmosphere outside the car or with the interior of the car, said walls being provided with openings at the upper part of said air space, whereby air may be taken either from outside the car or from inside the car, as desired, and circulated between said walls, and means for heating the air so introduced into the air space, substantially as and for the purposes described.

3. A railway car constructed with a hollow metal wall, said wall being provided with means near the bottom thereof whereby air may be introduced in the space inside said wall, and with means at the upper part

thereof whereby air may be discharged from the space inside said wall, in combination with means for directing the discharge of air from said space either outside of the car or into the interior of the car, as desired, substantially as and for the purposes described.

4. A railway car constructed with inner and outer metal walls between which is an air space, in combination with means for introducing air into the lower part of said air space either from outside the car or from inside the car, as desired, and means for putting the upper part of said air space into communication either with the atmosphere outside of the car or with the interior of the car, substantially as and for the purposes described.

5. A railway car constructed with inner and outer metal walls between which is an air space, in combination with means for introducing air into the lower part of said air space either from outside the car or from inside the car, as desired, means for putting the upper part of said air space into communication either with the atmosphere outside of the car or with the interior of the car, as desired, and means for heating the air circulated through said air space.

6. A railway car provided with hollow metal walls inclosing an air space, in combination with an inclosed air trunk in the lower part of said car communicating with said air space, a heating device arranged in said air trunk so as to heat the air in said trunk, said trunk being provided with openings for admitting air thereto from the interior of the car, and means for discharging air from the upper part of said space in the walls.

7. A railway car constructed with inner and outer metal walls between which is an air space, in combination with an air trunk in the lower part of said car communicating with said air space, means for introducing air into said trunk either from outside the car or from the interior of the car, as desired, a heating device in said air trunk, and means at the upper end of said air space for directing the outflow of air therefrom either outside the car or into the car, as desired.

8. A railway car constructed with inner and outer metal walls between which is an air space, in combination with an air trunk in the lower part of said car communicating with said air space, means for introducing air into said trunk either from outside the car or from the interior of the car, as desired, a heating device in said air trunk, and means at the upper end of said air space for discharging the air therefrom either outside the car or into the car, as desired.

9. A railway car constructed with inner and outer metal walls having between them an air space, in combination with an air trunk in said car, a heating device in said air trunk, an intake pipe extending through the roof of said car and into said air trunk and provided with a hood, said air trunk being in communication with the space between said walls; and means for discharging air from said space above its point of communication with the air trunk, either into the car or outside the car, whereby a circulation of air is established along the inner wall so as to modify the temperature thereof.

10. A railway car constructed with inner and outer metal walls having between them an air space, in combination with an air trunk in said car, a heating device in said air trunk, an intake pipe extending through the roof of said car and into said air trunk and provided with a hood, said air trunk being in communication with the space between said walls; means for discharging air from said air space above its point of communication with the air trunk, either into the car or outside the car, whereby a circulation of air is established along the inner wall so as to modify the temperature thereof, and means whereby air may be at will introduced into the trunk from the car.

11. A railway car constructed with inner and outer metal walls inclosing between them an air space, said walls being provided with air inlets near the lower part thereof adapted to put said air space into communication with the interior of a car and with air outlets near the upper part thereof, of heating means arranged to heat the air which passes through said air space, means for directing a quantity of air from outside of the car through the space between said walls, and means for controlling the flow of air to the space between said walls whereby air may be directed past said heating means and through said space either from the outside of the car or from the inside of the car.

12. A railway car, the side wall of which is formed of sheet metal structures spaced apart so as to provide an air space, means constituting an inclosed air trunk along the side of the car near the floor, which trunk comunicates with said air space and is formed with discharge openings into the car, said air space having discharge openings above said trunk, and a radiator located in said trunk.

13. A railway car, the side wall of which is formed of sheet metal structures spaced apart so as to provide an air space, means constituting an inclosed air trunk along the side of the car near the floor, which trunk communicates with said air space and is formed with discharge openings into the car, said air space having discharge openings above said trunk, a radiator located in said trunk, and valves to control the dis-

charge of heated air from the trunk into the interior of the car and into said air space.

14. A railway car, the side wall of which is formed of sheet metal structures spaced apart so as to provide an air space, means for directing a tempering current of air through said air space either from outside the car or from the interior of the car as desired, and means for directing the discharge of air from said space either into the interior of the car or outside of the car, as desired.

15. A railway car, the side wall of which is formed of sheet metal structures spaced apart so as to provide an air space, a radiator located along the side of the car, means for directing air past said radiator and into said air space either from outside of the car or from the interior of the car as desired, and means for directing the discharge of air from said space either into the interior of the car or outside of the car, as desired.

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Witnesses:
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