

1,008,536.

UNITED STATES PATENT OFFICE.

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METAL-WALL CONSTRUCTION FOR RAILWAY-CARS.

1,008,536.

Specification of Letters Patent.

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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 Metal-Wall Construction for Railway-Cars, of which the following is a specification.

My invention relates to improvements in the construction of railway cars in which the walls are largely or wholly made of steel, or other metal, because of which the inner contact, especially in sleeping cars, is unpleasantly heated or cooled by extremes of external temperature, my invention relating to features of construction of such a car whereby the inner wall is so tempered at all seasons of the year as to maintain such inner wall within a range of temperature which will be neither objectionably hot nor cold to the touch. In other words, I provide means for sufficiently neutralizing the cooling and heating influences of the external atmosphere to keep the temperature of the inner wall of the car at all seasons at a temperature which will not be objectionable for personal contact by the passengers in the car. These objects of my present invention are attainable by the several features of construction which will be hereinafter described and which are preferably used in conjunction and in the general arrangement shown; but which, as will be obvious, might be employed singly with some good results, and which, likewise, might be modified in the proportion, design and arrangement of parts in certain respects that will be obvious to those skilled in the art of car construction, without, however, departing from the scope of my invention.

In general I provide the outer sheet metal surfacing of the metal wall and the inner sheathing, which forms the inner surface of the car wall, with an air space and preferably a space through which air may be circulated from the bottom to the top of the car, this air being preferably heated in winter time. Preferably, in the form of invention shown herein, this air space is constituted by arranging inwardly of the ordinary sheet metal structure on the inside of the car, a sheathing preferably also of sheet metal, which is spaced away from the wall proper and which is also, by preference, se-

cured to the wall structure proper by means of blocks or bodies of fiber or wood or other material having relatively small capacity for conducting heat; these insulating bodies, as they may be termed, being preferably arranged, when the wall structure proper, as is usually the case, consists of an outer sheet metal wall, an inner sheet metal wall and metal beams or other supports between the same, so that such insulating bodies, or such other means as may be used for securing the inner sheathing to the wall structure proper, are placed out of line or in staggered relation with the metal beams or supports of the wall structure proper. By this latter construction and arrangement of parts the conduction of heat one way or another through the wall of the car is checked. The radiation of heat is diminished by the existence of the air space formed between the outer surface of the wall and the inner surface, and is further diminished by the provision for the circulation of air through such air space.

I do not claim herein broadly an arrangement whereby air, heated, or otherwise, may be circulated between the inner and outer sheet metal walls of a railway car, or the arrangement whereby the air may be introduced into the air space either from the interior of the car or from outside the car, and may be discharged from the air space either into the car or outside the car, as these arrangements are claimed in my co-pending application filed March 2, 1909, Serial No. 480,866, of which the present application is a division.

The invention of this application is illustrated in a preferred form of construction in the accompanying drawings, wherein—

Figure 1 is a fragmentary vertical sectional view through a car, the side wall of which is constructed in accordance with my invention. Fig. 2 a sectional plan taken on line 2—2 of Fig. 1. Fig. 3 a detail vertical section on line 3—3 of Fig. 1. Fig. 4 a detail sectional plan on line 4—4 of Fig. 1. Fig. 5 a partial vertical section on line 5—5 of Fig. 2, and Fig. 6 a fragmentary elevation of the inside surface of the wall illustrating means for admitting air to the air space from the interior of the car.

Like characters of reference indicate like parts in the several figures of the drawings. Referring to the drawings, A represents

the flooring of the car shown as laid on the longitudinal beams B. The wall structure proper of the car consists of a framework of beams C supporting an outer sheet metal wall D and the inner sheet metal wall E. The beams C may be of any desired form and construction and may be arranged in any way suitable for supporting the walls D and E and the roof of the car. This latter is shown as consisting of an upper sheet metal structure F and a lower sheet metal structure G. The roof of the car has the usual cupola H provided with the ventilators I, these parts being of any desired construction.

Within and attached to the sheet metal wall E is a sheathing J, preferably also of sheet metal. This sheathing is spaced away from the wall E by means of the blocks or bodies of material K; this material being preferably of wood, fiber or other material which has relatively small capacity for the conduction of heat. Preferably, as shown in Fig. 2, these insulating bodies K, as I have termed them, are arranged in staggered relation with the elements C forming the framework of the wall structure proper of the car. Preferably, the attachment of the bodies K to the wall E and the sheathing J is such that there is no metal contact between the wall and the sheathing. For example, the insulating blocks K may be riveted to the wall E by the rivets k , the heads of which lie in countersunk holes k' in the block K. The inner sheathing is preferably thin enough so that it may be secured to the blocks by the nails k^2 .

The wall of the car is, of course, provided with the usual windows which are shown at L.

Preferably, the sheet metal wall E has the offset portion E' forming an enlarged space M at the bottom of the air passage way N between the wall E and the sheathing J. The ordinary steam or hot water pipes O may be located in the enlarged space M.

The construction of the car is preferably such that the space between the wall E and the sheathing J may be put into communication either with the atmosphere outside of the car or with the interior of the car, both at the bottom of the space and also at the top. For example, the floor of the car may be formed with the opening P closed by the slide valve Q (Fig. 3) which is operated between the guides q by means of the lever R and connecting rod r . The sheathing J may be formed with a series of perforations S which may be closed or opened, as desired, by means of a sliding shutter T arranged between the guides t . There will ordinarily be a number of such series of perforations and shutters the length of the car. The hollow construction of the roof gives a passage way U for the air from the space N, the

roof structure being provided with the perforation or series of perforations u by means of which the air enters the interior of the car. If the ventilators are open, as shown by the dotted lines in Fig. 1, the air circulated between the wall E and the sheathing J will immediately escape from the car. Preferably the sheathing J will also have the openings or series of openings V which may be closed or partially closed by the shutters W. By this means a part of the heat from the radiating pipes O may be directed into the interior of the car.

By these several features of construction the conduction and radiation of heat through the outer wall will be materially checked and diminished. It has been found that in winter time the inner surfaces of the walls of the railway cars of steel construction are frequently so cold, due to the ready conductivity of the metal composing the wall structure, as to be very unpleasant and detrimental to health. This is particularly so in the case of sleeping cars. By the provision of the sheathing J and the circulation of heated air along the outer surface of the sheathing the inner surface of the wall of the car, even though the wall be made entirely of metal, is kept at a comfortable temperature. This result is furthered by the use of the insulating blocks K for connecting the sheathing with the wall structure proper of the car and by arranging these connecting bodies, whether they be of what has been termed insulating material or not, in staggered relation with the metal parts, the beams C, which connect the outer sheet metal wall D with the inner sheet metal wall E; since the several paths for the conduction of the heat are thereby lengthened.

By a suitable regulation of the various devices for controlling the inflow and discharge of air to and from the air space N, the air, which is circulated through such space, may be taken either from outside the car and discharged outside the car or from within the car and discharged outside of the same, which will provide a means of ventilation, or may be taken from within the car and discharged back into the car, which will be desirable in very cold weather and when the car is first heated up, as it will involve a saving of heat.

In summer time the inner surfaces of the walls of cars of ordinary steel construction have been often rendered unendurably hot, particularly when the train travels over wide stretches of unsheltered country in the sunshine and with the temperature very high. In such case, with the construction of wall above described, the temperature of the inner surfaces of the wall and of the atmosphere within the car may be very considerably modified, since in such wall structure the metal constituting the inner sur-

face of the wall is insulated from the metal with which the sun's rays come in direct contact, and furthermore by the circulation of air established through the air space N as a result of the heating of the upper part of the car structure to a greater extent than the lower part.

I have shown the car constructed so that the air from outside of the car will enter the air space in the wall through openings in the floor. Obviously, any other means might be employed for introducing the air from outside the car into such air space.

I claim:

1. In a railway car, the combination with an external wall structure comprising two sheet metal walls and supports for the same arranged between said walls, of an inner sheathing spaced from said external structure so as to constitute a passage way for the circulation of air which is open at the top, and means for opening communication between the lower end of said passage way and the interior of the car, or the outside atmosphere, as desired.

2. In a railway car, the combination with an external wall structure comprising two sheet metal walls and supports for the same arranged between said walls, of an inner sheathing spaced from said external structure so as to constitute a passage way for the circulation of air provided with an air outlet, means whereby air may be directed into said passage way either from the inte-

rior of the car or from outside the car, the wall of the car having an opening adjacent said air outlet through which the air from said passageway may escape out of the car, and means for closing said opening when desired.

3. A railway car having a wall structure comprising three metal walls spaced apart, and means for circulating hot or cold air between the inner and the intermediate walls so that said circulation comes into contact with the inner wall, for the purpose specified.

4. A railway car comprising an external metal side wall structure comprising two sheet metal walls, an inner metal sheathing which is spaced away from said external wall structure so as to provide a passageway for the circulation of air open at the top, a radiator located along the side of the car adjacent the floor, inclosing means for the radiator which incloses a space communicating with said passageway, said inclosing means formed with an air inlet communicating with the outside of the car, an air inlet communicating with the interior of the car, and an air outlet to the interior of the car, and dampers adapted to close said inlets and outlet.

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Witnesses:

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