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G. G. GILPIN

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RAILWAY REFRIGERATOR CAR

Original Filed Dec. 5, 1930

3 Sheets-Sheet 1

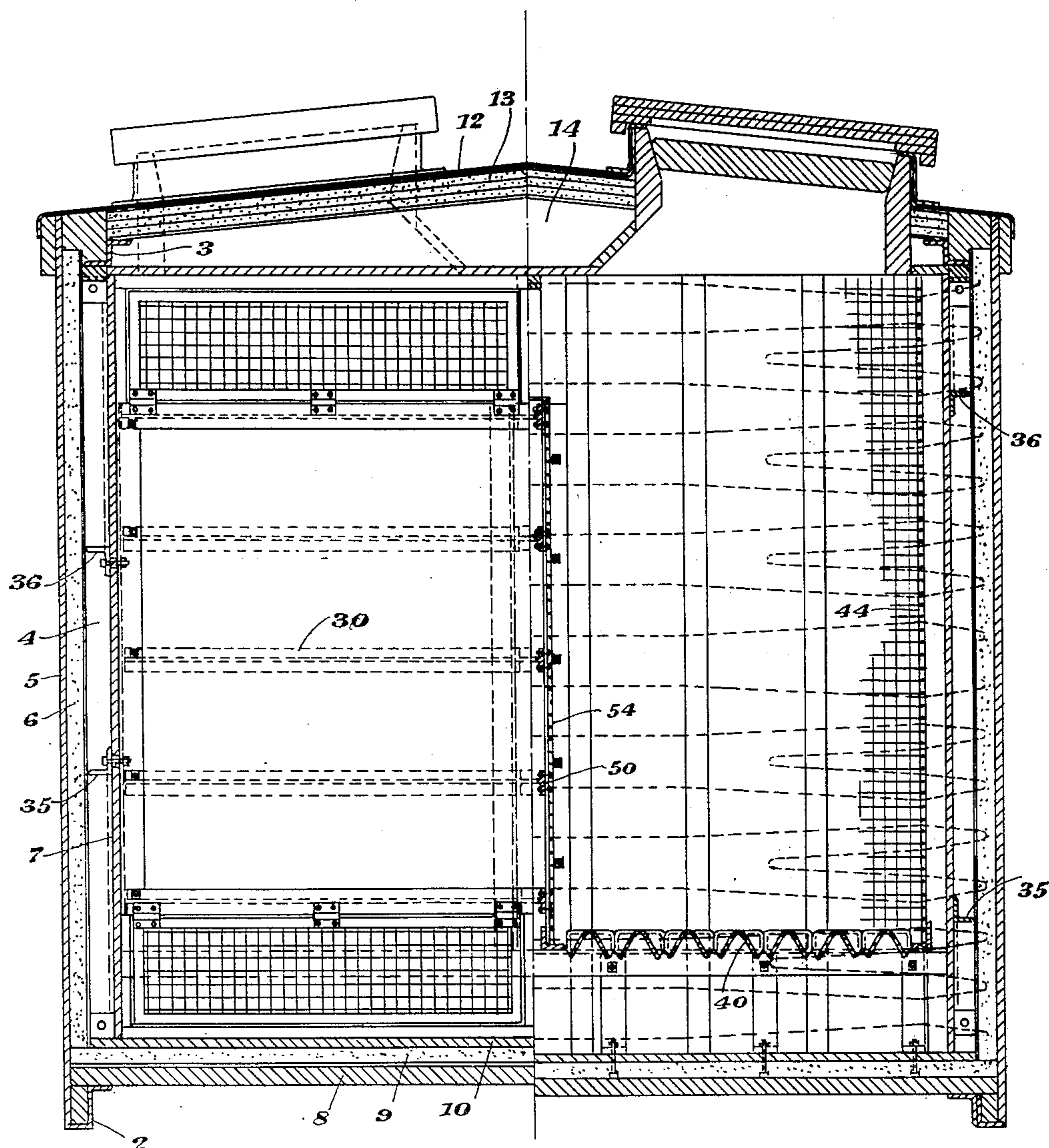


Fig. 1

Inventor
Garth G. Gilpin
Anton E. Sisson
Attorney

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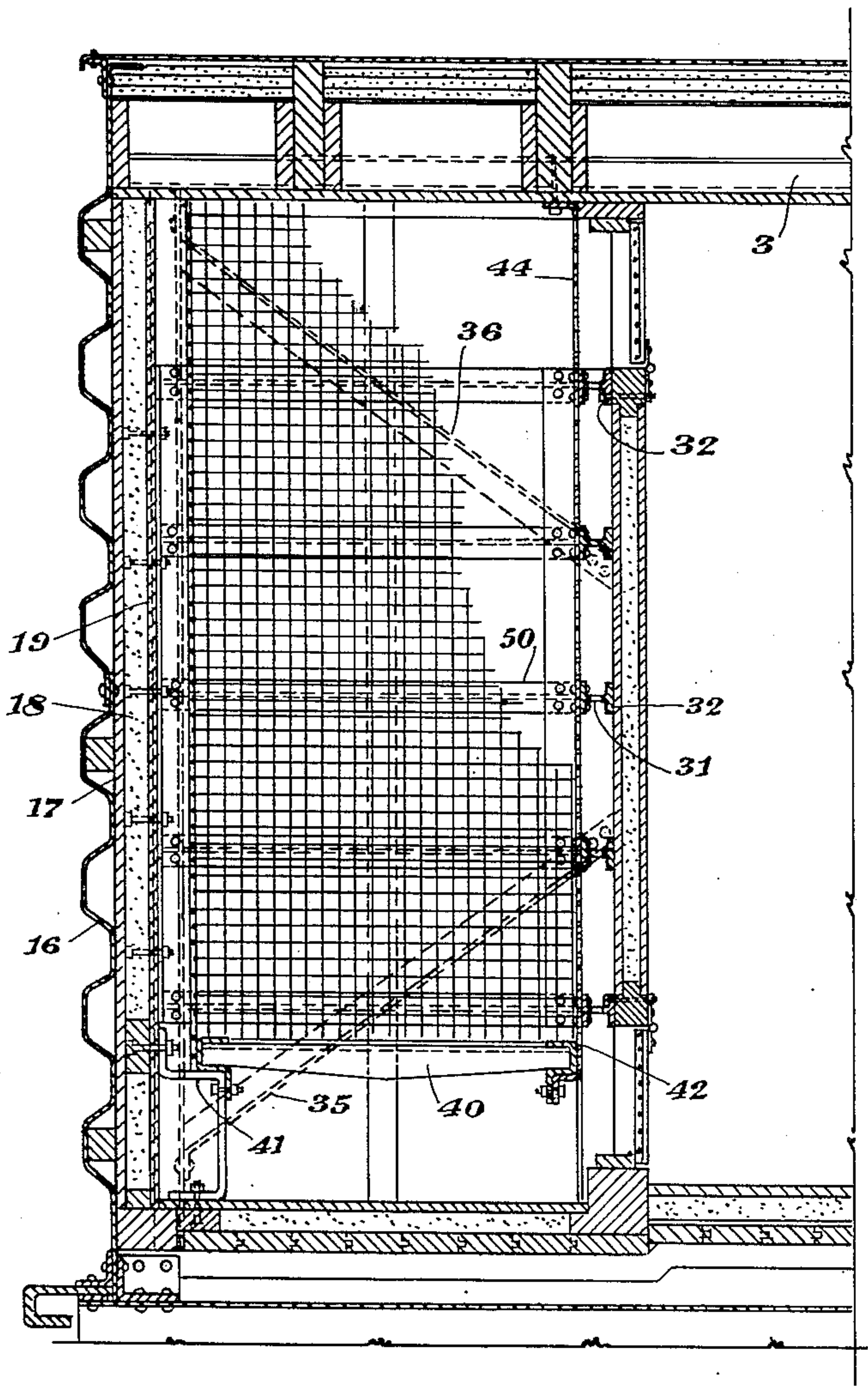


Fig. 2

Inventor
Garth G. Gilpin
Anton E. Sisson
Attorney

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3 Sheets-Sheet 3

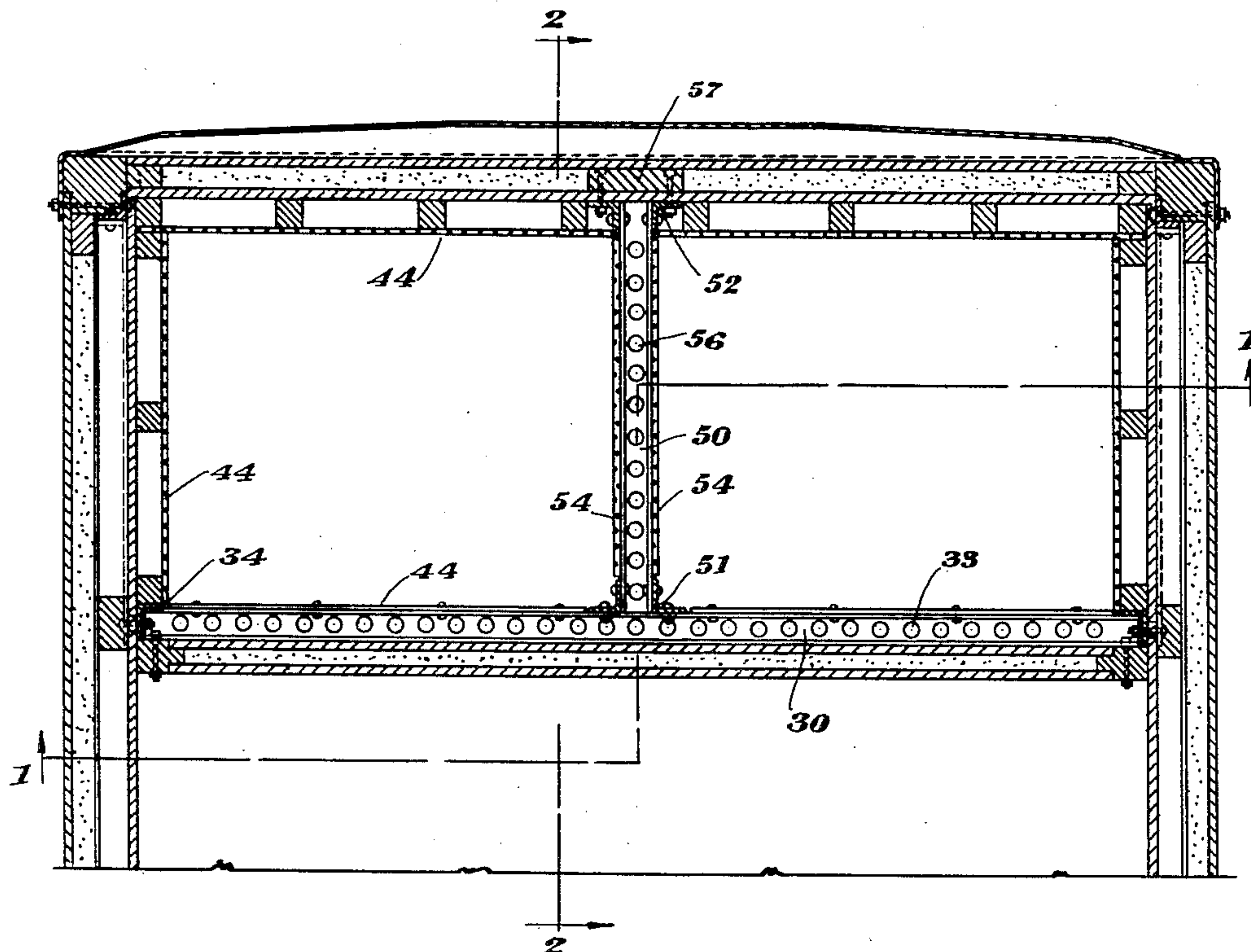


Fig. 3

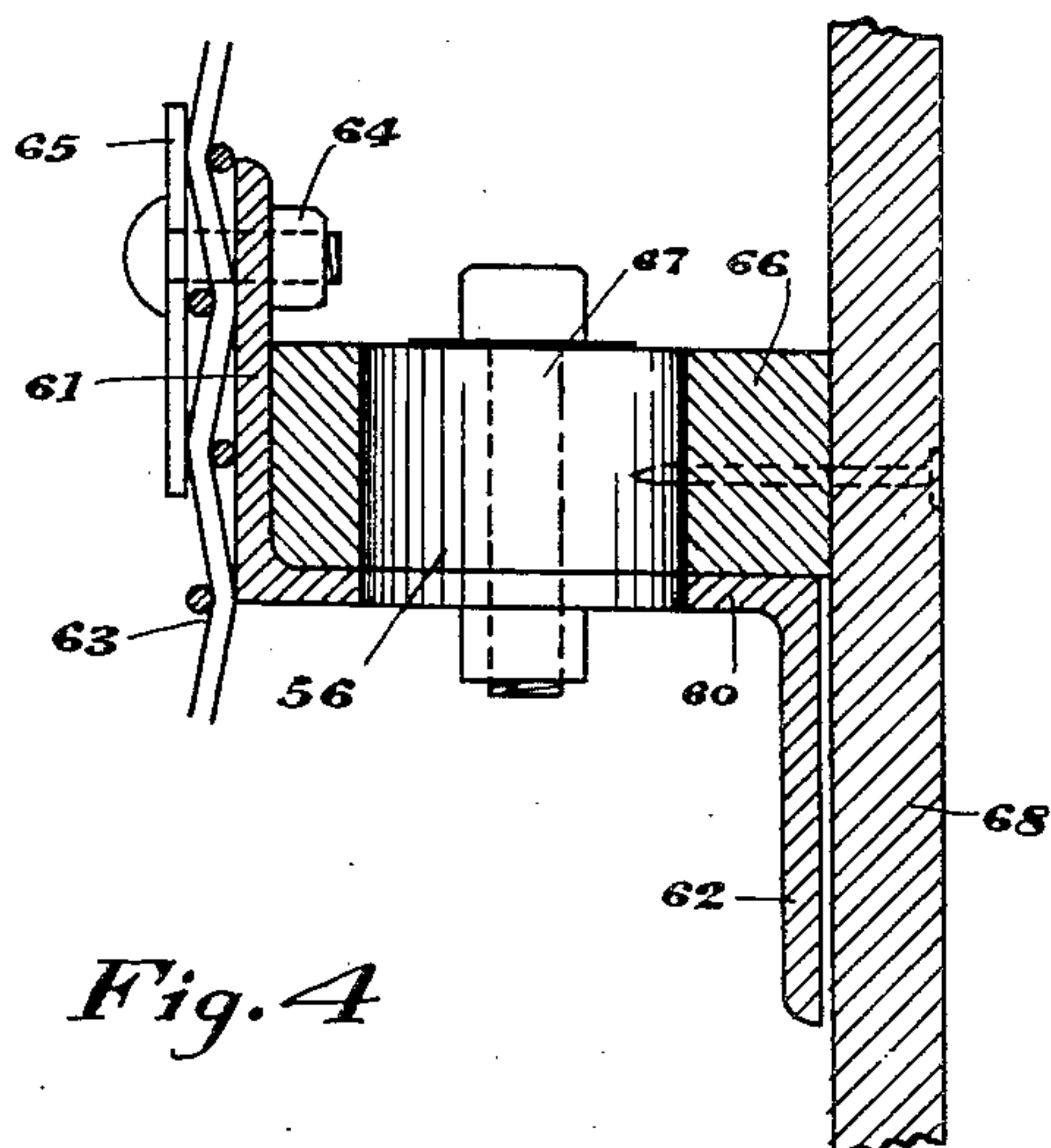


Fig. 4

Inventor
Garth G. Gilpin
Anton F. Fickler
Attorney

UNITED STATES PATENT OFFICE

GARTH G. GILPIN, OF RIVERSIDE, ILLINOIS, ASSIGNOR TO UNION METAL PRODUCTS COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE

RAILWAY REFRIGERATOR CAR

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The invention relates to refrigerator cars used by railways to transport perishable commodities, such as meat, milk, fruit and vegetables, which cars have their side walls, end walls, floors and roofs insulated and are provided with an ice box or basket at one or both ends of the car. Hatchways are provided above the ice boxes for icing the ice box, which are closed by hatch plugs. The melting ice cools the interior of the car and its contents by the cool air moving downwardly through an air space which surrounds the ice basket, thence along the floor end, being warmed by the lading, rising to adjacent the ceiling and thence toward one of the ice boxes where it is cooled and repeats the movement. False floors are furnished to keep the lading slightly off the floor.

Such ice boxes are formed by providing an insulated partition or bulkhead, as it is called, about four feet from the end of the car, which bulkhead does not quite extend to the floor, nor to the roof or ceiling of the car, so as to permit the movement of air heretofore described. A gridded latticed or openwork door of some kind is usually hinged to the lower margin of the bulkhead to keep foreign matter out of the ice box and for cleaning the ice box. The space between the upper margin of the bulkhead and the ceiling of the car is partially closed by a grille or netting to also keep foreign matter out of the ice box.

As packages, boxes and barrels containing heavy contents are frequently loaded in such refrigerator cars, these bulkheads must be very strong to resist the tendency of the cargo to shift, which tendency is caused by the sudden stopping or starting of the train. This inertia force has been greatly increased in recent years by the use of heavy locomotives, long trains, hump yards and car retarders. The bulkhead is insulated so that the air cannot penetrate it and thus destroy the circulating movement heretofore described.

It is customary to provide end walls for ordinary box or house cars which comprise a metallic plate or plates provided with a plurality of parallel contiguous corrugations which are preferably positioned horizontal-

ly and terminate within the plate or plates adjacent the opposite side walls of the car to which said plates are secured. Such a corrugated end wall has proved to be very efficient in resisting shifting cargo and also in preserving the rectangularity of the entire superstructure of the car. Such an end wall may be lined or even insulated if desired.

One of the objects of this invention is to provide a metallic bulkhead or partition which extends between the opposite side walls of the car and to adjacent floor and roof respectively of the car and comprises a plurality of horizontally disposed beams having their opposite ends secured to the side walls of the car, to which the ice box netting and insulation are secured, such beams being perforated to permit circulation of the air.

Another object of the invention is to provide a strut or struts between the end wall and bulkhead of a refrigerator car so that they mutually reinforce each other, and a still further object is to so form such strut or struts so that the ice box or basket is divided into two or more parts having a circulation of air between such parts whereby the efficiency of the ice box is increased.

Another object is to provide diagonal braces which reinforce the bulkhead at its junctures with the side walls of the car, which preferably transmit stresses therefrom to the end sill and end plate, respectively of the car.

In the drawings:

Fig. 1 shows a cross section of a refrigerator car incorporating my invention wherein the left side of the center line shows a view looking toward the ice box or baskets of the car and the right side of the center line is a section through the ice box or baskets of the car.

Fig. 2 is a longitudinal section through the car showing the relation of the end wall, bulkhead and ice baskets.

Fig. 3 is a horizontal section through the end wall and partition and struts.

Fig. 4 shows the relation between the beam, netting and sheathing of the insulation.

In the accompanying drawings the usual

parts of the car are shown, such as side sill 2; side plate 3; side wall framing 4; side wall sheathing 5; side wall insulation 6; side wall lining 7; flooring 8; flooring insulation 9; upper flooring 10; roofing 12; roofing insulation 13; carlines 14; corrugated end wall 16; end wall sheathing 17; end insulation 18 and end lining 19.

The end of the car is reinforced by a metallic plate provided with a plurality of substantially parallel corrugations which preferably merge together adjacent their middles to form a lesser number of preferably deeper corrugations, which construction provides a relatively stiff and strong end wall adjacent its middle and a relatively weak and resilient end wall adjacent the side walls of the car to which it is secured. This end wall is preferably insulated in the usual manner shown in Fig. 2.

The bulkhead comprises a plurality of horizontally disposed beams 30, each of which preferably comprise a web 31 and a vertical flange 32 at each margin thereof, such as the I-beam shown in the drawings, or a rolled Z-bar or channel section. The netting forming the ice basket is secured to said beams on one side thereof and the insulation is secured to said beams on the other side thereof. Each of the beams is provided with a plurality of apertures 33 to allow circulation of the air. When an I-beam, Z-bar or channel section is used these apertures are punched in the webs. The ends of these beams are secured to a vertical member 34 attached to the side walls of the car, which member is reinforced by a diagonal brace 35 extending from adjacent the middle of the member 34 to the end sill 2 of the car and also preferably by another similar diagonal member 36 extending to the side plate 3 of the car.

Fig. 4 is an enlarged section showing the beam comprising a web 60, inner upright flange 61 and outer depending flange 62. The netting 63 is secured to the upright flange by means of the bolt 64 and washer 65 and a preferably wooden nailing strip 66 is secured to the web of the beam by means of the bolts 67 to which the sheathing 68 is nailed. This sheathing backs up the insulation of the bulkhead, which is not shown. The aperture 56 extends through the nailing strip 66 and web 60 of the beam.

The ice box is located between the end wall and the bulkhead and comprises a series of ice grates 40 supported by a beam 41 adjacent the end wall of the car and by brackets 42 secured to the horizontal beam forming the bulkhead. Any convenient form of ice grates may be used. The ice basket comprises a netting 44, adjacent to but spaced apart from the end wall, bulkhead and side walls, respectively, and the ice is placed into this basket.

The strut-beam between the end wall and bulkhead comprises a plurality of spaced apart I-beams 50 extending from the bulkhead to adjacent the end wall 16, which are shown secured to the bulkhead by means of two upright angles 51 and are also secured to the end wall of the car by similar upright angles 52. The upright angles 52 are secured to and backed up by a preferably wooden strip 57 in contact with the end sheathing which in turn is in contact with the corrugations in the metallic end wall. These upright angles constitute spreader beams to distribute the thrust over the bulkhead and end wall, respectively. In this construction the netting 54 forming the ice basket is secured to opposite sides of the I-beams or struts 50 and apertures 56 are provided in such I-beams or struts to allow the circulation of air, which apertures may be large perforations in alignment, as shown in Fig. 3, or may be formed of a plurality of staggered smaller holes. In this arrangement the ice basket is divided into two parts which allows more air to descend adjacent the ice, therefore increases the cooling capacity of the ice box; in other words, the partition or strut not only transmits horizontal loads from the bulkhead to the end wall and vice versa, but also provides means to increase the cooling capacity of the ice box.

The accompanying drawings illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof, within the scope of the claims, will occur to persons skilled in the art.

I claim:

1. A bulkhead for a railway refrigerator car having spaced apart side walls comprising a plurality of horizontally disposed beams having their opposite ends secured to said side walls respectively, an insulation secured to said beams on one side thereof, and a netting secured to said beams on the other side thereof, said beams being provided with apertures to allow circulation of air between the insulation and the netting.
2. A bulkhead for a railway refrigerator car having spaced apart side walls comprising a plurality of horizontally disposed beams, each having a web and a vertical flange at each margin thereof, said beams having their opposite ends secured to said side walls respectively, an insulation secured to the flanges on one side of the webs, and a netting secured to the flanges on the other side of the webs, said webs being provided with apertures to allow circulation of air between the insulation and the netting.
3. A bulkhead for a railway refrigerator car having spaced apart side walls comprising a plurality of horizontally disposed

beams, each having a web and a vertical flange at one margin thereof, said beams having their opposite ends secured to said side walls respectively, nailing strips secured to said webs, an insulation secured to said nailing strip, and a netting secured to said flanges, said webs and nailing strips being provided with apertures to allow circulation of air between the insulation and the netting.

4. A bulkhead for a railway refrigerator car having spaced apart side walls comprising a plurality of horizontally disposed beams having their opposite ends secured to said side walls respectively, an insulation secured to said beams on one side thereof, and a netting secured to said beams on the other side thereof, said beams being provided with apertures to allow circulation of air between the insulation and the netting, the lowermost of beams being provided with means to support ice box grates.

5. In a refrigerator car having an end wall and a bulkhead, the combination of an ice basket positioned between the end wall and bulkhead comprising two parts separated by a partition extending between the end wall and bulkhead, said partition comprising a plurality of horizontal members having apertures therein to allow circulation of air, and a netting secured to each side of said members.

6. In a refrigerator car, the combination of an ice basket comprising two parts separated by a partition, said partition comprising a plurality of horizontal members having apertures therein to allow circulation of air, and a netting secured to each side of said members.

7. In a railway refrigerator car having spaced apart side walls, an end wall and a bulkhead, the combination of a metallic plate end wall attached to the side walls and formed with a plurality of horizontal corrugations, said bulkhead comprising horizontally disposed beams with their opposite ends secured to the side walls with an insulation on one side of said beams and a netting on the other side thereof, said beams provided with apertures to allow circulation of air, and a partition extending longitudinally of the car between the end wall and bulkhead, said partition comprising a plurality of horizontal members having apertures therein to allow circulation of air and having a netting secured to each side of said members.

GARTH G. GILPIN.