Jan. 3, 1939. W. P. MURPHY 2,142,797

REFRIGERATOR CAR FLOOR

Filed Aug. 25, 1936 2 Sheets-Sheet 1

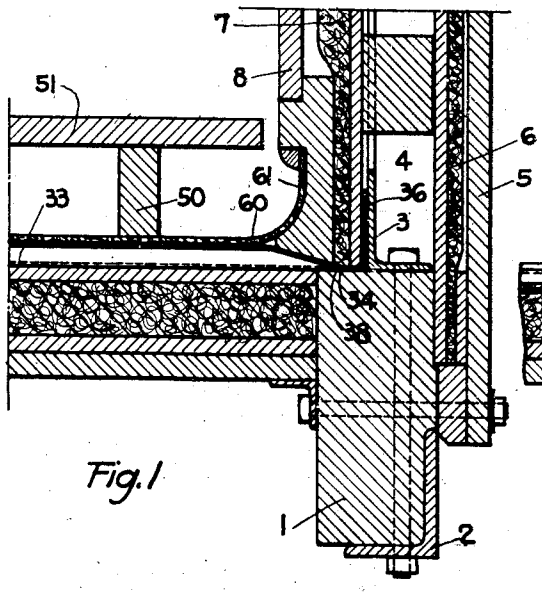


Fig. 1

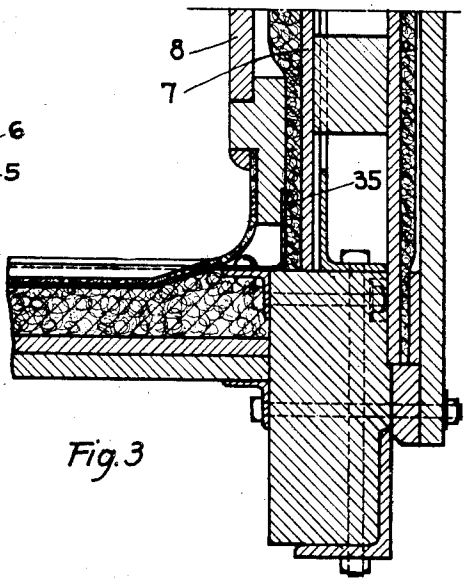


Fig. 3

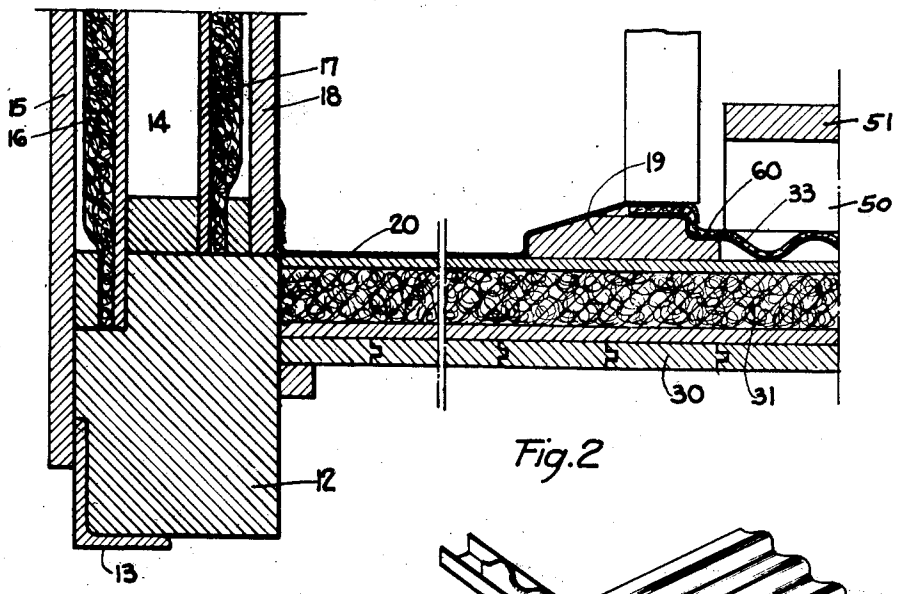


Fig. 2

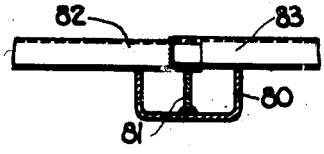


Fig. 5

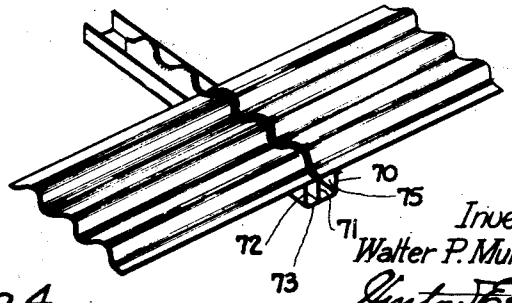


Fig. 4

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REFRIGERATOR CAR FLOOR

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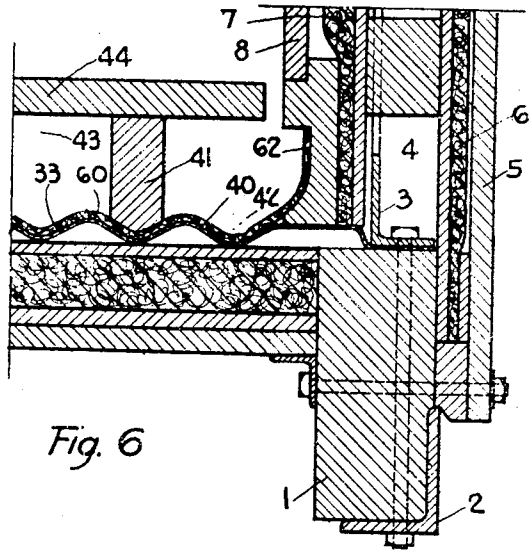


Fig. 6

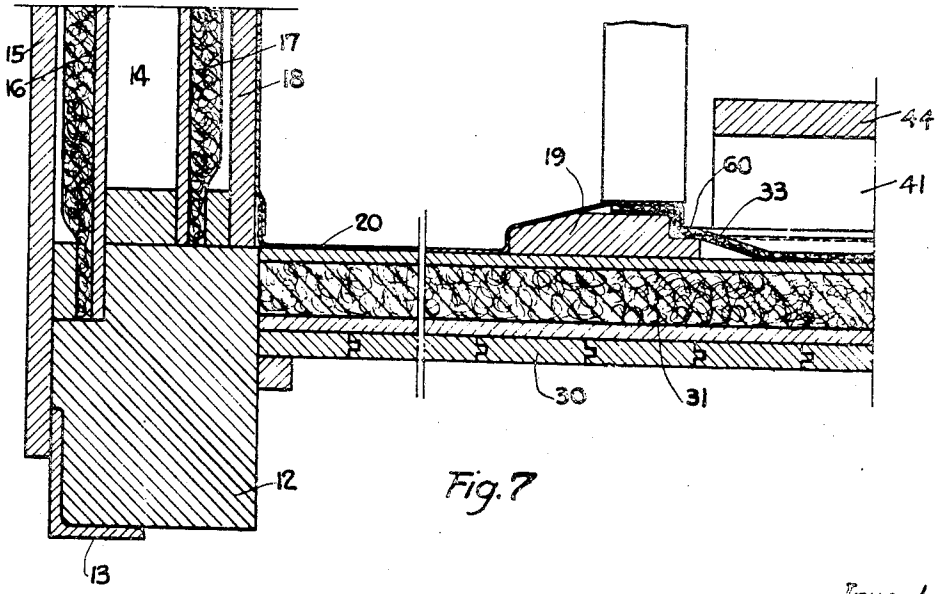


Fig. 7

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REFRIGERATOR CAR FLOOR

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8 Claims. (Cl. 105—422)

The invention relates to railway refrigerator cars which are used to transport perishable commodities, such as fruits, vegetables, fish, candies, flowers, etc., and more particularly to a floor construction thereof, and has for its object to provide a very efficient, strong and light floor construction which is economic to manufacture and easy to build in the car.

Formerly ice was confined in an ice basket in the bunker of a railway refrigerator car and the lading was cooled by circulation of air around the ice and between the perishable commodities in the lading compartment, and the water from the melting ice was trapped and drained to the exterior of the car so that it was impossible for the water to damage the insulation of the car. In recent years, however, it has become common practice to put cakes of ice on top of the perishable commodity containers after they are loaded in the car. Some fresh vegetables and ferns are frequently loaded in the car by alternating layers of such vegetables (or ferns) with layers of cracked ice. Perishable commodities are also preserved by blowing pulverized ice over and between the packages after they are loaded in the car. These and other methods of cooling where the ice is in contact with the lading result in considerable water in the car. (Cars are sometimes precooled by putting cakes of ice in the car and closing the doors and allowing the ice to melt. Condensation (or sweating) also causes moisture in a car.) If the water is allowed to contact the insulation the insulating value thereof would be decreased, and one of the principal objects of this invention is to prevent the water from destroying or reducing the efficiency of the insulation.

A further object is to secure a relatively thin corrugated metallic sheet to the underframe or other structural elements of the car in such manner and position to help resist the tendency of the car to weave when moving at high speed over rough track; provide great strength to support the weight of the lading and the impact force thereof; prevent infiltration of air from the outside to the interior of the car due to the whirling of air below a car when in motion; preserve the floor insulation of the car by preventing moisture inside the car from penetrating the insulation, thereby destroying its insulating value, and also preserving the floor insulation by preventing the weaving movements of the car in motion from detaching the floor insulation from its moorings.

Another object is to eliminate the usual wooden flooring and increase the vertical inside height of the lading compartment of the car by substituting therefor a shallow corrugated metallic sheet.

Another object is to make the metallic floor of a plurality of corrugated sheets and to weld the adjacent margins of such sheets together so that the heat used for liquefying the welding material cannot ignite the inflammable insulation generally used in a railway refrigerator car, such as wool felt, and another object is to insulate that portion of the floor of the car around the parts of the corrugated sheets to be welded with inflammable insulation, such as asbestos.

In the form of my invention illustrated Fig. 1 is a cross section in a vertical plane through the floor and side wall of a refrigerator car having my improved floor.

Fig. 2 is a cross section in a vertical plane through the floor and end wall of the car shown in Fig. 1.

Fig. 3 shows a modified construction of Fig. 1.

Figs. 4 and 5 show means of attaching adjacent corrugated floor reinforcing sheets together.

Fig. 6 is a cross section in a vertical plane of the floor and side wall of a refrigerator car showing a modification of my improved floor construction.

Fig. 7 is a cross section in a vertical plane of the floor and end wall of the car shown in Fig. 6.

In the drawings the usual parts of the car are shown, such as side sill 1; side sill reinforcing angle 2; side truss lower chord 3; side truss post 4; side sheathing 5; outside side insulation 6; inside side insulation 7; inside lining 8; end sill 12; end sill reinforcing angle 13; end framing 14; end sheathing 15; end outside insulation 16; end inside insulation 17; end lining 18; bearing rail 19 and ice tank pan 20.

My improved floor construction comprises a wooden flooring 30 supported by the sills 1 or 12; an insulation 31 supported by the wooden flooring 30 and a metallic protecting sheet 33 covering the insulation 31 and having its side margins 34 preferably overlapping and secured to the sills 2 so as to retard the weaving of the car and so as to prevent moisture within the car from wetting the floor insulation 31.

The metallic protecting sheet is preferably formed with an upstanding marginal flange 35 positioned to prevent moisture within the car from wetting the sill 2 or floor insulation 31 and is also preferably positioned on the inside of the side insulation 7, as shown in Fig. 3, to prevent moisture from wetting the side insulation 7.

Fig. 1 shows a flange 36 secured to the lower chord 3 of the side truss.

The metallic protecting sheet 33 is preferably formed with a plurality of sinuous stiffening corrugations which materially increase the strength of the sheet to resist vertical loads or diagonal stresses. These corrugations preferably merge into the sheet and overlap the sill 1 so as to carry vertical loads imposed on the corrugated sheet to the sill 1 (or sills 1—12). These corrugations preferably extend laterally of the car and merge into the sheet 38 in spaced relation to the upstanding flange 35 or 36 so that the portion of the sheet between the ends of the corrugations and the flange form a trough or gutter for movement of water lengthwise of the car. The corrugations preferably project upwardly to drain water to the gutter. This gutter preferably communicates with the pan 20 below the ice chamber, which pan is usually provided with an outlet to the exterior of the car (not shown in the drawings).

Figs. 6 and 7 show a modified construction wherein the corrugations 40 extend lengthwise or longitudinally of the car and merge into the sheet adjacent the bearing rail 19, as shown in Fig. 7. In this arrangement the floor stringers 41, which also extend longitudinally of the car, are parallel to the corrugations 40 so that the spaces 42 between the corrugations form a part of the longitudinal flue 43 for air circulation from the ice chamber to below the lading. The usual foraminous or slatted floor is shown at 44 in Fig. 6.

When the corrugations extend laterally of the car, as shown in Figs. 1, 2 and 3, the stringers 50 are preferably serrated at their lower edges to fit within the corrugations so that any tendency of the cargo to shift longitudinally of the car is resisted by the corrugations through the medium of the floor stringers 50—51 in the foraminous floor.

As stated before, one of the objects of the invention is to eliminate the usual wood flooring and increase the vertical inside height of the lading compartment of the car by substituting therefor a shallow corrugated metallic sheet. The usual wooden flooring is about 1¾" thick and I contemplate using a corrugated sheet about ¾" over the corrugations, meaning a saving of about 1" in the vertical height of the lading compartment. When the corrugations extend lengthwise of the car the distance between the foraminous floor and the corrugated plate could be reduced because the spaces between the corrugations form part of the air circulating flue, which means that the lading compartment could be further increased in height.

A waterproof, non-rigid material, such as a water-proofed felt paper, is preferably laid on top of the corrugated sheet and conforms to the contour thereof. This material protects the metallic sheet 33 against corrosion. This waterproof material preferably has its margins turned upwardly (61—62) on the inside of the side wall so that the metallic sheet marginal flange (35 or 36) and the upturned margin (61—62) of the waterproof material 60 provide independent means to retain water within the lading compartment of the car.

The insulation 31 of the floor of the car usually comprises some light flammable material, and one of the objects of the invention is to provide means to attach adjacent margins of adjacent corrugated sheets together so that the heat used to liquefy the welding material cannot ignite the flammable insulation. This means is provided by a channel member 70 extending normal to the corrugations and positioned above the insulation 31 and attached to the sills or other structural members of the car in any convenient manner. This channel member 70 is provided with an upstanding tongue 71 preferably between the upstanding flanges 72 of the channel member and is welded, or otherwise secured, to the web 73 of the channel member. The adjacent margins of the adjacent sheets are welded to this tongue so that any heat or spark caused by the welding process is within the channel and cannot ignite the insulation. The upper surface of the tongue is preferably serrated, (as shown in Fig. 4), and the adjacent sheets abut the tongue on opposite sides thereof and are welded to the tongue with the corrugations registering with the serrations. If it is desired to insulate the spaces 75 within the channel member some nonburnable or noncombustible insulation, such as asbestos, is used. Fig. 5 shows a modification of the means of welding adjacent sheets together, in which a channel member 80 is provided with a tongue 81 and the adjacent sheets 82—83 overlap each other and also overlap the tongue 81, and the overlapped portions are welded together, as shown. The edge of one corrugated sheet is welded to the other corrugated sheet to waterproof the joint.

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. In a refrigerator car having spaced apart sills, a floor extending between said sills, said floor comprising an insulation, a metallic protecting sheet covering said insulation having its side margins secured to said sills so as to prevent moisture within the car from wetting the floor insulation, said metallic protecting sheet formed with corrugations merging into the sheet adjacent said sills so as to brace the floor against weaving and waterproof non-rigid material laid on top of the corrugated sheet which conforms to the contour thereof.

2. In a refrigerator car having spaced apart sills, a floor extending between said sills and a side wall comprising an insulation, said floor comprising an insulation, a metallic protecting sheet covering said insulation having its side margins secured to said sills, said metallic protecting sheet formed with upstanding marginal flanges to prevent moisture within the car from wetting said floor insulation or said wall insulation, said metallic sheet formed with stiffening corrugations and waterproof non-rigid material laid on top of the corrugated sheet which conforms to the contour thereof, said waterproof material having its margins turned upwardly on the inside of said wall whereby the metallic sheet marginal flange and the upturned margin of the waterproof material provide independent means to retain water within the lading compartment of the car.

3. In a refrigerator car having a sill, a floor comprising an insulation, a metallic protecting sheet covering said insulation having its side margins secured to said sill so as to retard weaving of the car and so as to prevent moisture within the car from wetting the floor insulation, said

metallic protecting sheet formed with stiffening corrugations, and means to attach the adjacent margins of adjacent sheets together comprising a channel member extending normal to the corrugations and positioned above said insulation having an upstanding tongue within said channel, said adjacent margins being welded to said tongue.

4. In a refrigerator car having a sill, a floor comprising an insulation, a metallic protecting sheet covering said insulation having its side margins secured to said sill so as to retard weaving of the car and so as to prevent moisture within the car from wetting the floor insulation, said metallic protecting sheet formed with stiffening corrugations, and means to attach the adjacent margins of adjacent sheets together comprising a channel member extending normal to the corrugations and positioned above said insulation having an upstanding tongue within said channel with a serrated upper surface, said adjacent sheets abutting said tongue on opposite sides thereof and the adjacent sheets being welded to the tongue with the corrugations registering with the serrations.

5. In a refrigerator car having a sill, a floor comprising an insulation, a metallic protecting sheet covering said insulation having its side margins secured to said sill so as to retard weaving of the car and so as to prevent moisture within the car from wetting the floor insulation, said metallic protecting sheet formed with stiffening corrugations, and means to attach the adjacent margins of adjacent sheets together comprising a channel member extending normal to the corrugations and positioned above said insulation having an upstanding tongue within said channel, said adjacent margins being welded to said tongue, and noncombustible insulation within said channel.

6. A floor for a refrigerator car comprising an insulation, a covering for said insulation, said covering comprising a plurality of metallic sheets lying in substantially the same plane, and means to attach the margins of adjacent sheets together comprising a channel member having an upstanding tongue within said channel to which said margins are welded, said channel member comprising a web on each side of said tongue engaging the adjacent metallic cover sheet so that the sparks of welding will not contact the insulation.

7. A floor for a refrigerator car comprising an insulation, a covering for said insulation, said covering comprising a plurality of corrugated metallic sheets lying in substantially the same plane, means to attach the margins of adjacent sheets together comprising a channel member having an upstanding tongue within said channel with a serrated upper surface fitting said corrugations to which said margins are welded, said channel member comprising a web on each side of said tongue engaging and fitting the adjacent corrugated sheet so that the sparks of welding will not contact the insulation.

8. A floor for a refrigerator car comprising an insulation, a covering for said insulation, said covering comprising a plurality of metallic sheets lying in substantially the same plane, means to attach the margins of adjacent sheets together comprising a channel member having an upstanding tongue within said channel to which said margins are welded, and non-combustible insulating material within said channel, said channel member comprising a web on each side of said tongue engaging the adjacent metallic cover sheet so that the sparks of welding will not contact the insulation.

WALTER P. MURPHY.