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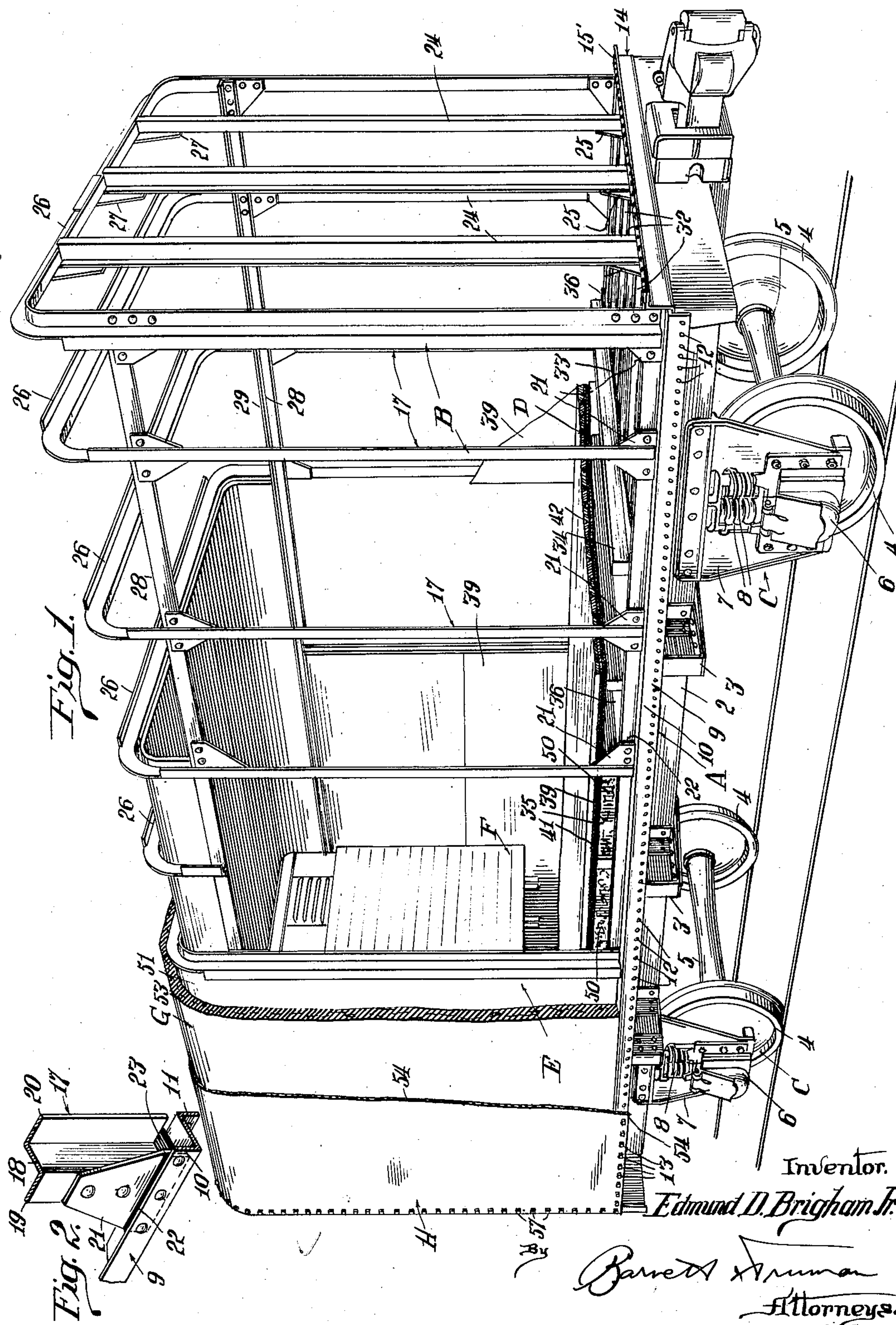
E. D. BRIGHAM, JR

2,021,909

INSULATED CAR

Filed Nov. 5, 1932

4 Sheets-Sheet 1



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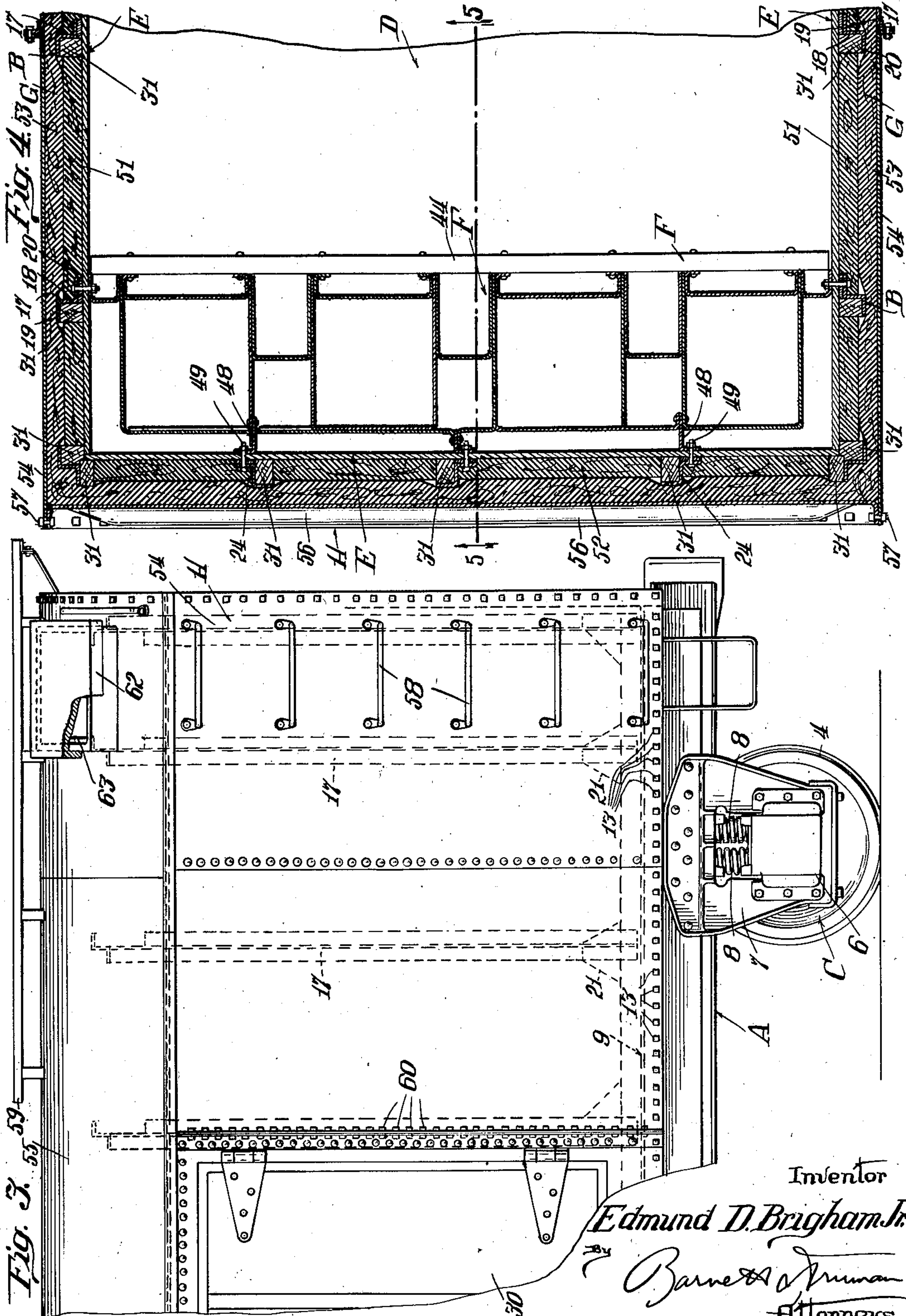
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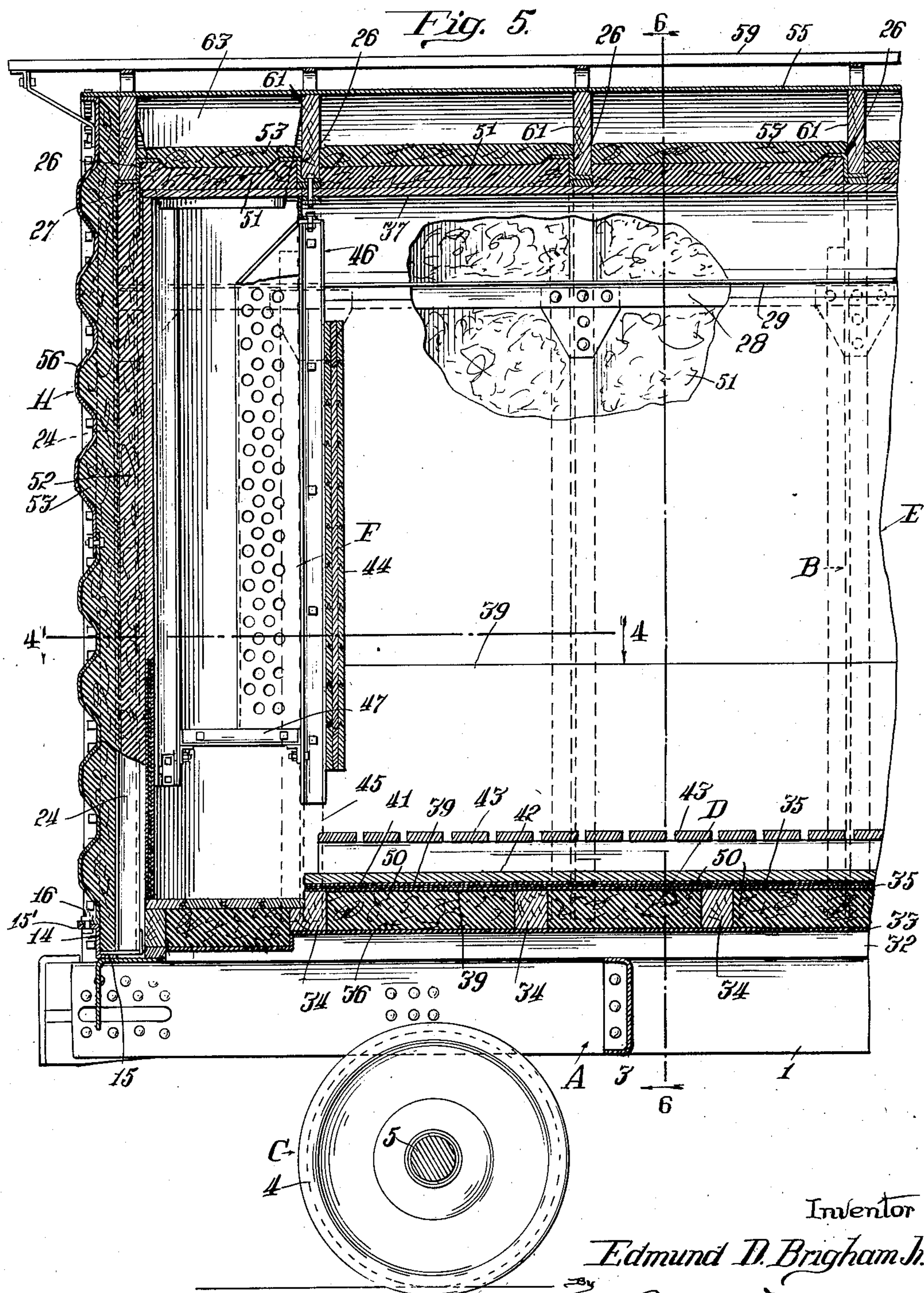
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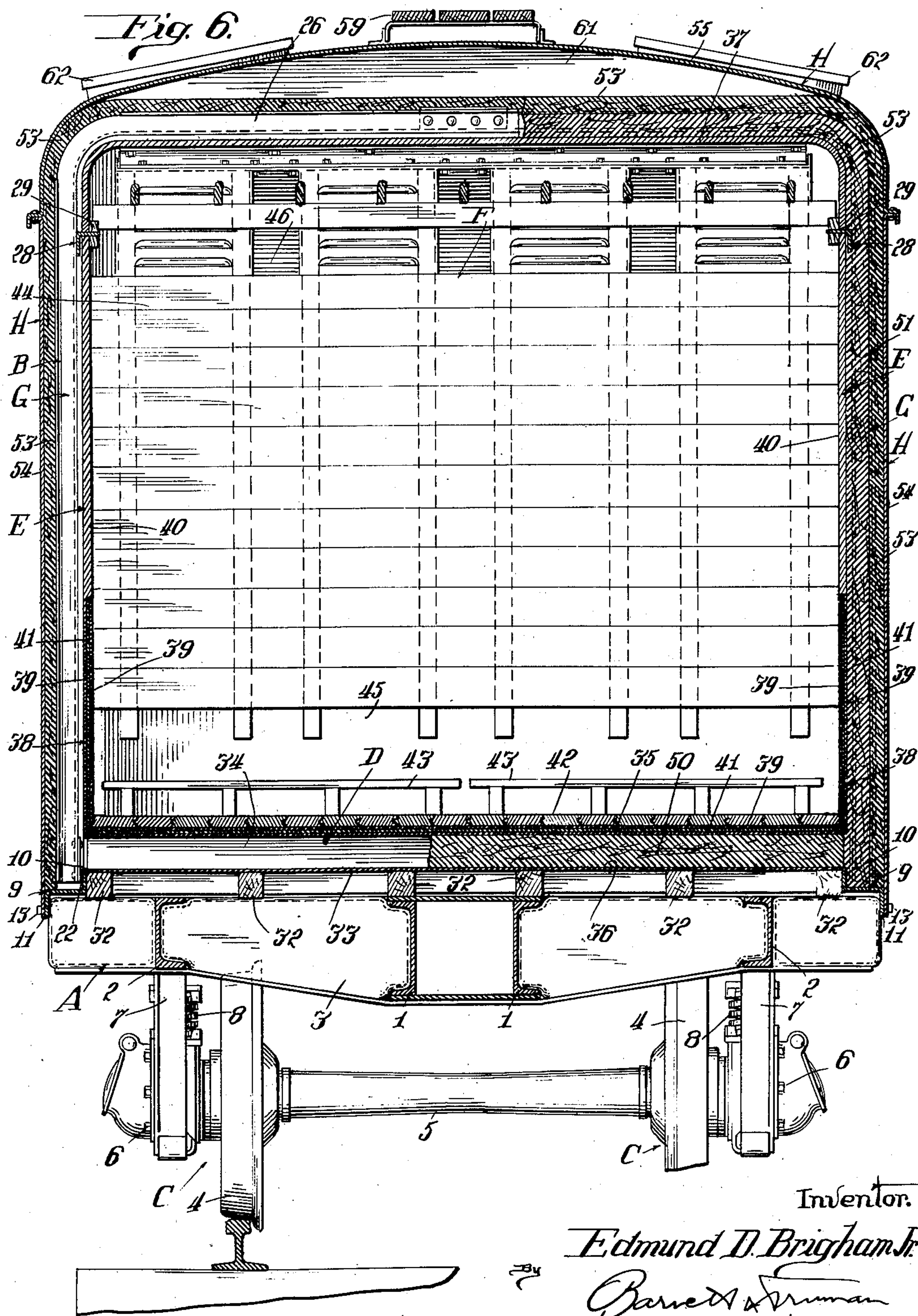
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,021,909

INSULATED CAR

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Application November 5, 1932, Serial No. 641,422

20 Claims. (Cl. 105—409)

This invention relates to certain new and useful improvements in an insulated car, more especially a small refrigerator railway car, although many of the features of this invention are equally suitable for use in other types of vehicles such as refrigerator cars of standard size, motor trucks, or other conveyances for perishable commodities.

Refrigerating cars ordinarily comprise a closed body having inner and outer walls with insulating material interposed between these walls or built into the walls, this insulation extending throughout the side and end walls, floor and roof so as to minimize the passage of heat from the exterior to the interior of the car. This insulation is subject to deterioration and loss of efficiency, usually caused by the seepage of moisture thereinto either from the exterior or the interior of the car. The car could be restored to its normal efficiency by replacing this insulation, but this cannot ordinarily be accomplished without more or less completely tearing down the car body construction. According to the present improvement, the car comprises a fixedly assembled metallic frame structure consisting of a lower platform supported from the wheels or trucks, and uprights and arches spaced apart and supported from the platform which form the skeleton of the side and end walls and the roof. A floor, supported by the platform, is built within this frame, and a lining or inner wall is assembled within the car and supported from the floor and skeleton framework. The floor is formed with transversely extending passages which open at the sides of the car above the platform. All of this portion of the car is permanently assembled and need not ordinarily be disturbed during the life of the car. Insulating material is removably positioned in the floor passages, and a covering of insulating material encloses the supporting framework or skeleton. Over this insulating covering is placed an outer metallic shell which is removably attached at its lower edges to the edge portions of the supporting platform. All of the exterior car equipment at the sides, ends and top of the car are carried by this metallic shell and are bodily removable therewith. By simply detaching this shell from the platform and lifting the shell from the car, all of the insulation is exposed and may be quickly removed and replaced.

The principal object of this invention is to provide an improved insulated car of the type briefly described hereinabove and disclosed more in detail in the specifications which follow.

Another object is to provide an improved refrigerator car comprising a removable exterior metallic shell.

Another object is to provide an improved, permanently positioned floor for a refrigerator car, in which insulation is removably positioned.

Another object is to provide an improved waterproof lining for a refrigerator car.

Another object is to provide an improved, permanently assembled metallic skeleton for a refrigerator car.

Another object is to provide an improved refrigerator car adapted to carry small shipments.

Another object is to provide an improved refrigerator car in which all of the insulation may be removed and replaced without disturbing the car framework or inner wall and floor construction.

Other objects and advantages of this invention will be more apparent from the following detailed description of one approved form of refrigerator car constructed and operating according to the principles of this invention.

In the accompanying drawings:

Fig. 1 is a perspective view of the car with portions of the exterior and interior construction broken away.

Fig. 2 is a detail perspective showing the means for attaching and supporting the lower end portion of one of the metallic uprights.

Fig. 3 is a partial side elevation of one end portion of the car.

Fig. 4 is a horizontal section through one end portion of the car body, the view being taken substantially on the line 4—4 of Fig. 5.

Fig. 5 is a partial longitudinal vertical section through one end portion of the car, the view being taken substantially on the line 5—5 of Fig. 4.

Fig. 6 is a transverse vertical section, taken substantially on the line 6—6 of Fig. 5.

The car here shown by way of example is a small refrigerator railway car of the four-wheeled type adapted to carry small shipments insufficient to fill a refrigerator car of standard size. A car of this size may be made of lighter and simplified construction and is useful for transporting and storing small shipments of perishable goods which would only partially fill an ordinary refrigerator car, thus avoiding transfer or rehandling of these foods and consequent exposure, and avoiding delays in shipment. It will be apparent, however, as the disclosure proceeds that the principal improvements of this invention could be incorporated in railway refrigerator cars of standard

size, or in the refrigerated bodies of motor trucks or other conveyances. It is to be understood that all of these uses are contemplated as being within the scope of this invention as outlined in the claims.

The car comprises in general a metallic platform or base structure A, an upper metallic skeleton or supporting frame B mounted on the platform A, and the wheeled supporting structure C by means of which the platform A is supported on and transported along the rails, all of this basic metallic supporting structure consisting of the parts A, B, and C being permanently and for the most part rigidly assembled. A floor assembly indicated generally at D is supported on platform A within the frame B, and a lining or inner wall E is supported by the floor D and framework B. The compartments F for holding the refrigerant are built into the end portions of the car inside of the lining E. The insulating covering indicated generally at G completely encloses the framework B, the sides, ends and roof of the car and the edge portions of floor D. The outer metallic shell indicated generally at H completely encloses the insulation G and is secured at its lower edges to the platform A.

The platform A is of openwork construction, and may be built up in well known manner of longitudinally extending steel angle beams 1 and 2, transverse trusses or beams 3 and such intermediate braces or tie members as may be required. The platform A is carried by the supports C consisting of wheels 4 mounted on axles 5 journaled in bearing boxes 6 which are vertically slidable in the brackets 7 secured to platform A, springs 8 being interposed between the journal boxes 6 and the upper portions of brackets 7. It will be understood that in cars of larger size, swiveled trucks may be substituted for the simplified supporting means C here disclosed.

Longitudinally extending angle beams 9 (Fig. 6) are supported upon and secured to the upper end portions of the cross members or struts 3 of platform A, these beams having inner upwardly extending flanges 10, and outer downwardly extending flanges 11 provided with openings 12 for receiving the bolts or rivets 13 by means of which the sides of the outer metallic shell H is anchored in place, as hereinafter described. Transverse angle bars 14 having lower inwardly extending horizontal flanges 15 secured to the upper end edge portions of platform 1, have upper outwardly extending horizontal flanges 15' which are perforated to receive the attaching bolts or rivets 16 by means of which the end members of outer shell H are anchored in place. The side portions of the skeleton or frame B comprise a series of similar spaced apart uprights 17 in the form of metallic angle bars, each comprising an intermediate web 18 extending transversely through the wall-space, and inner and outer oppositely extending flanges 19 and 20 extending parallel with the side of the car, the inner flange 19 being secured at its lower end by means of gusset plate 21 to the inner upright flange 10 of side beam 9. It will be noted (see Fig. 2) that plates 22 and 23 of suitable fiber board or other heat-insulating material are interposed between the metal members of the uprights 17 and the metal beam 9 for the purpose of breaking the "frost-line", that is minimizing the conduction of heat between these metallic members. It might here be noted, without further description thereof, that similar insulating plates are used at a number of different locations throughout this metallic assembly for

the purpose of preventing the transfer of heat between the metallic members exposed respectively at the inner and outer sides of the car walls. Spaced apart uprights 24 similar to the uprights 17, are positioned at the ends of the car and are attached to and supported by angle bracket members or gussets 25 mounted on platform A. Arch members 26 in the form of suitable angle beams bridge the upper portion of the frame to support the roof structures. The arches 26 form extensions of the opposite side uprights 17 so as to form substantially continuous spaces between these uprights and arches, said spaces extending continuously around the sides and roof of the frame structure. The upper ends of the end uprights 24 are secured to the end arches 26 by means of gussets 27. Runners or angle beams 28 extend longitudinally of the upper inner portion of the car, being secured to the upper end portions of the side uprights 17, these runners having inwardly extending flanges 29 which support the roof portion of the inner wall or lining E. This metallic supporting frame or skeleton B may be provided with additional bracing members or gussets not here specifically described, and it will be noted that the central portions of the side wall framework are modified to provide the larger openings necessary to receive the usual side-doors 30. Wood posts or studs 31 are mounted in the angles between flanges 18 and 20 of the several uprights 17 and 24. The car lining E is mounted against these studs 31, which also serve to space the lining away from direct contact with the steel framework B.

The floor indicated generally at D is built upon the platform A within the frame B. The lowermost floor structure comprises a plurality of spaced apart wood beams or runners 32 extending longitudinally of the car and resting on the platform A, and a superposed sheet or layer 33 of fiber board or composition, preferably waterproof. A series of spaced apart transverse wood beams 34 rest on sheet 33, and above these beams 34 is supported a second sheet 35 of composition material, thus providing a plurality of transversely extending passages 36 which open at both ends through the respective sides of the car. The floor insulation is inserted in these passages as hereinafter described. The car lining E or inner wall, is built up of sheets of wood or fiber-board or other preferably water-proof composition so as to completely enclose the sides, ends, roof and floor of the inner car space. The roof portion 37 of the lining E is supported on the inwardly extending flanges 29 of the horizontal runners 28 of the frame construction. The portions of lining E forming the floor covering 35 and the lower portions 38 of the side and end walls are built up of two superposed sheets 39 of the composition material, these sheets being thinner than the sheets which are used for the upper portions 40 of the side and end walls, and the roof portion 37. Between the two layers 39 is interposed a continuous sheet or layer 41 of waterproof material which extends across the floor and up into the lower portions of the sides and ends so as to form an imperforate waterproof "pan". This waterproof layer 41 may be built up of several layers of waterproof paper imbedded in tar, or of any other suitable waterproof material. This waterproofed inner lining will prevent the passage of water through the floor construction and lower side and end walls when the car is washed out. Considerable moisture also accumulates within the car. Suitable drain openings may be

provided for the removal of this water. An inner wooden floor 42 is placed upon the floor covering 35, and suitable racks 43 for holding the goods to be shipped and refrigerated are positioned on the floor 42.

Any suitable refrigerating means F may be provided for refrigerating the car. As here shown, bulk-heads 44 are positioned transversely of the car, at one or both ends thereof, each bulk-head terminating at its upper and lower ends short of the floor and roof of the car so as to provide passages 45 and 46 through which the air within the car circulates. A metallic bin or basket assembly 47 is positioned in the compartment between the bulk-heads 44 and the adjacent end of the car, this assembly 47 providing receptacles for ice or other refrigerant and air passages around and adjacent to this refrigerant. This bin assembly 47 may be supported by brackets 48 which are connected by bolts 49 passing through the inner lining E and the inner flanges 20 of the uprights 17 and 24 of the frame B.

Wooden beams 61 rest on the metallic arches 26, and are suitably curved on their upper surfaces to support the rounded top 55 of the metal shell H as hereinafter described.

All of the construction thus far described in detail, comprising the parts indicated generally by the characters A, B, C, D, E, and F, constitutes what may be termed the permanently assembled portion of the car. None of the parts thus far described need be disturbed when the insulation G is to be removed and replaced.

The insulating cover G may be built up of strips or sheets of any suitable insulating material, as ordinarily used for this purpose. Strips of insulation 50 are first inserted in the floor passages 36 which are open and exposed at the sides of the car before the side wall insulation is placed in position. The side walls, ends and roof of the car are then completely covered with strips or layers of this insulation material. Strips 51 of this insulation may be positioned between each adjacent pair of uprights 17 and top arches 26 and this strip may run continuously around the two sides and roof of the car. Similar strips 52 are positioned between the uprights 24 at the ends of the car. An outer layer 53 of insulating material is then added so as to completely enclose all of the metallic framework B. It will be noted that this insulating covering G extends down to the platform A at the sides and ends of the car so as to enclose the edge portions of the floor D.

Over this insulating covering G is placed the outer removable metallic shell H. This shell H comprises side walls 54 and the roof 55 which may be permanently assembled and removed as a unit. The end walls 56 are removably attached at their edge portions to the end edges of the sides 54 and roof 55, by means of the removable rivets, or bolts 57 (see Figs. 3 and 4). As already described, the lower edge portions of the sides and ends are removably secured to the platform A by means of the removable bolts 13 and 16. All of the equipment usually carried on the sides, ends and roof of the car, such as the ladder 58 and running board 59 for example, are mounted on and removable with the outer metallic shell H. The side door constructions indicated at 30 may either be carried, in whole or in part, by the outer shell H or by the permanent car framework. If the doors 30 are not removable with the outer shell, the side walls 54 adjacent the doorway may be removably attached by bolts such as indicated at 60, Fig. 3. Suitable covers 62 car-

ried by the roof 55 close the upper ends of hatch-openings 63 through which ice or other refrigerant is introduced into the bins 47.

It will be noted that the metallic shell H only contacts with the insulation G or with the wooden supports 61, except for the lower edge portions which are attached to the metallic platform A, and non-metallic insulating material is interposed between this platform and the frame B and inner car construction. Hence there are no metallic connections for facilitating the transfer of heat from the exterior to the interior of the car.

In case it becomes necessary to replace or repair the insulation G, either in whole or in part, the outer shell H is removed by withdrawing the attaching bolts and lifting off the shell parts by means of a suitable hoisting mechanism. As already noted, the sides and roof may be removed as a unit. All of the insulation is now accessible and any portion or all of it may be removed and replaced. By lifting away the lower portions of the side insulation, the floor insulation 50 is accessible and may be drawn out laterally from floor passages 36 and replaced. After the insulation has been renewed, the outer shell H will be replaced in an obvious manner.

I claim:

1. A refrigerator car comprising a fixedly assembled supporting platform and body frame, wheeled means for supporting the platform, insulated inner walls carried by and enclosing the frame, an insulated floor within the frame, and an outer wall in the form of a metallic shell fitting freely about the inner walls and removably attached to the platform.

2. A refrigerator car comprising a fixedly assembled supporting platform and body frame, wheeled means for supporting the platform, insulated inner walls carried by and enclosing the frame, an insulated floor within the frame, and an outer wall in the form of a metallic shell removably secured adjacent its lower edges to the edge portions of the platform.

3. A refrigerator car comprising a fixedly assembled supporting platform and body frame, wheeled means for supporting the platform, insulated inner walls carried by and enclosing the frame, an insulated floor within the frame, an outer wall in the form of a removable metallic shell comprising connected side and top walls, the lower edge portions of the side walls being removably secured to the side edges of the platform, and end walls removably secured to the side and top walls and to the end edges of the platform.

4. A refrigerator car comprising a fixedly assembled supporting platform and body frame, wheeled means for supporting the platform, insulated inner walls carried by and enclosing the frame, an insulated floor within the frame, and an outer removable casing comprising a metallic shell and the outer car equipment above the platform which equipment is mounted on and removable with the shell, said casing being removably attached adjacent its lower edges to the platform.

5. A refrigerator car comprising a fixedly assembled metallic structure comprising a platform and a body frame consisting of spaced apart uprights, roof arches and connecting brace beams, wheeled means for supporting the platform, an insulated floor within the body frame, a lining wall mounted within the frame, a covering of insulating material positioned between and

outside of the frame members, and an outer metallic shell removably attached to the platform and fitting freely over the assembly carried by the platform.

5 6. A refrigerator car comprising a fixedly assembled metallic structure comprising a platform and a body frame consisting of spaced apart up-
rights, roof arches and connecting brace beams,
10 wheeled means for supporting the platform, an insulated floor within the body frame, a lining
wall mounted within the frame, a covering of in-
sulating material positioned between and outside
of the frame members, a metallic shell removably
positioned over the insulation, and means for re-
15 movably attaching the lower edge portions of the shell to the edges of the platform.

7. A refrigerator car comprising a fixedly as-
sembled metallic structure comprising a platform
and a body frame consisting of spaced apart up-
20 rights, roof arches and connecting brace beams,
wheeled means for supporting the platform, an insulated floor carried by the platform within the
body frame, a lining wall mounted within the
frame, a covering of insulated material positioned
25 between and outside of the frame members, and
a removable outer metallic shell, said shell com-
prising connected side and top walls, the lower
portions of the side walls being removably se-
cured to side edges of the platform, and end walls
30 removably secured to the side and top walls and
to the end edges of the platform.

8. A refrigerator car comprising a fixedly as-
sembled metallic structure comprising a platform
and a body frame consisting of spaced apart up-
35 rights, roof arches and connecting brace beams,
wheeled means for supporting the platform, an inner body structure permanently built within
the frame, a removable insulating covering for
the frame, and an outer metallic shell removably
40 attached adjacent its lower edges to the platform.

9. A refrigerator car comprising a fixedly as-
sembled supporting platform and a body frame
comprising spaced apart uprights, top arches and
connecting members, wheeled means for support-
45 ing the platform, an exterior covering of insulat-
ing material enclosing the sides, ends and top of
the frame, an outer metallic shell enclosing the
insulating material and removably secured to the
edges of the platform, a floor positioned within
50 the frame and supported by the platform, said
floor comprising upper and lower structures sepa-
rated by transversely extending non-metallic
beams so as to provide open ended floor passages
extending through the car from side to side when
55 the side wall coverings are removed, insulating
material removably positioned in these passages,
and a lining for the interior of the car body.

10. A refrigerator car comprising a fixedly as-
sembled supporting platform and a body frame
comprising spaced apart uprights, top arches and
connecting members, wheeled means for support-
60 ing the platform, an exterior covering of insulat-
ing material enclosing the sides, ends and top of
the frame, an outer metallic shell enclosing the
insulating material and removably secured to the
edges of the platform, a floor positioned with-
in the frame and supported by the platform, said
65 floor comprising upper and lower structures sepa-
rated by transversely extending non-metallic
beams so as to provide open ended floor passages
extending through the car from side to side when
the side wall coverings are removed, laterally ex-
tending strips of insulating material removably
70 positioned in these passages, and a lining for
the interior of the car body.

11. A refrigerator car comprising a fixedly as-
sembled supporting platform and a body frame
comprising spaced apart uprights, top arches and
connecting members, wheeled means for support-
ing the platform, an exterior covering of insulat- 5
ing material enclosing the sides, ends and top
of the frame, an outer metallic shell enclosing the
insulating material and removably secured to the
edges of the platform, a floor positioned within
the frame and supported by the platform, 10
said floor comprising upper and lower structures
separated by transversely extending non-metallic
beams so as to provide open ended floor passages
extending through the car from side to side when
the side wall coverings are removed, insulating 15
material removably positioned in these passages,
and a lining for the interior of the car body, the
lower portion of this lining comprising a con-
tinuous interior layer of waterproof material
which covers the floor and extends upwardly into 20
the lower portions of the side and end walls of
the lining.

12. A refrigerator car comprising a fixedly as-
sembled supporting platform and a body frame
comprising spaced apart uprights, top arches and 25
connecting members, wheeled means for support-
ing the platform, an exterior covering of insulat-
ing material enclosing the sides, ends and top of
the frame, an outer metallic shell enclosing the
insulating material and removably secured to the 30
edges of the platform, an insulated floor posi-
tioned within the frame and supported from the
platform, and a lining for the interior of the car
body, the lower portion of this lining comprising
a continuous interior layer of waterproof ma- 35
terial which covers the floor and extends up-
wardly into the lower portions of the side and
end walls of the lining.

13. A refrigerator car comprising a fixedly as-
sembled metallic structure comprising a platform 40
and a body frame consisting of spaced apart up-
rights, roof arches and connecting brace beams,
wheeled means for supporting the platform, a
floor positioned on the platform within the frame,
the floor comprising upper and lower floor struc- 45
tures spaced apart by non-metallic beams extend-
ing from side to side of the car so as to provide
open-ended passages between the beams extend-
ing laterally of the car, insulation removably po-
sitioned within the passages, a lining wall 50
mounted within the frame, a covering of insulat-
ing material positioned between and outside of
the frame members and enclosing the sides, ends
and roof and the edge portions of the floor, and
a removable outer metallic shell. 55

14. A refrigerator car comprising a fixedly as-
sembled metallic structure comprising a platform
and a body frame consisting of spaced apart
uprights, roof arches and connecting brace
beams, wheeled means for supporting the plat- 60
form, a floor positioned on the platform within
the frame, the floor comprising upper and lower
floor structures spaced apart by non-metallic
beams extending from side to side of the car
so as to provide open-ended passages between 65
the beams extending laterally of the car, insula-
tion removably positioned within the passages, a
lining wall mounted within the frame, a covering
of insulating material positioned between and
outside of the frame members and enclosing the 70
sides, ends and roof and the edge portions of the
floor, a metallic shell removably positioned over
the insulation covering, and means for removably
attaching the lower edge portions of the shell to
the edges of the platform.

15. A refrigerator car comprising a fixedly assembled metallic structure comprising a platform and a body frame consisting of spaced apart uprights, roof arches and connecting brace beams, wheeled means for supporting the platform, a floor positioned on the platform within the frame, the floor comprising upper and lower floor structures spaced apart by non-metallic beams extending from side to side of the car so as to provide open-ended passages between the beams extending laterally of the car, insulation removably positioned within the passages, a lining wall mounted within the frame, a covering of insulating material positioned between and outside of the frame members and enclosing the sides, ends and roof and the edge portions of the floor, and a removable outer metallic shell, said shell comprising connected side and top walls, the lower edges of the side walls being removably attached to the side edges of the platform, and end walls removably secured to the side and top walls and to the end edges of the platform.

16. A refrigerator car comprising a fixedly assembled metallic structure comprising a platform and a body frame consisting of spaced apart side and end uprights, transverse roof arches forming extensions of the side uprights, and inner connecting brace beams, wheeled means for supporting the platform, an insulated floor positioned on the platform within the frame, a lining wall within the frame, an insulating covering comprising strips of insulating material positioned between the uprights and arches, and additional insulating material exteriorly covering the frame members and insulating strips to completely enclose the sides, ends and roof, and an outer removable metallic sheet removably secured to the edge portions of the platform.

17. A refrigerator car comprising a fixedly assembled metallic structure comprising a platform and a body frame consisting of spaced apart side and end uprights, transverse roof arches forming extensions of the side uprights, and inner connecting brace beams, wheeled means for supporting the platform, an insulated floor positioned on the platform within the frame, a lining wall within the frame, an insulating covering comprising strips of insulating material positioned between the uprights and arches, and

additional insulating materials exteriorly covering the frame members and insulating strips to completely enclose the sides, ends and roof, and an outer removable metallic shell removably secured to the edge portions of the platform, said shell comprising connected side and top walls, the lower edges of the side walls being removably attached to the side edges of the platform, and end walls removably secured to the side and top walls and to the end edges of the platform.

18. A refrigerator car comprising a fixedly assembled supporting platform and body frame, wheeled means for supporting the platform, insulated inner walls carried by and enclosing the frame, an insulated floor within the frame, and a removable outer metallic shell comprising connected side and top walls, the lower portions of the side walls being removably secured to the side edge portions of the platform, and end walls removably secured to the side and top walls and to the end portions of the platform.

19. A refrigerator car comprising a fixedly assembled supporting platform and body frame, wheeled means for supporting the platform, insulated inner walls carried by and enclosing the frame, an insulated floor within the frame, and a removable outer metallic shell adapted to fit freely over the inner walls and frame, the shell comprising assembled side, top and end walls, and means for removably securing the lower portions of the side and end walls to the edge portions of the platform.

20. A refrigerator car comprising a permanently assembled car structure consisting of a platform, wheeled means for supporting the platform, a supporting frame for the walls and roof carried by the platform, a hollow floor positioned on the platform within the frame, and an inner lining carried by the floor and frame and enclosing the space within the car, an outer removable metallic shell freely enclosing the frame and floor and secured at its lower edges to the platform, and insulating material positioned within the frame and floor, said insulating material being accessible and removable when the shell is removed without disturbing the permanently assembled car structure.

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