

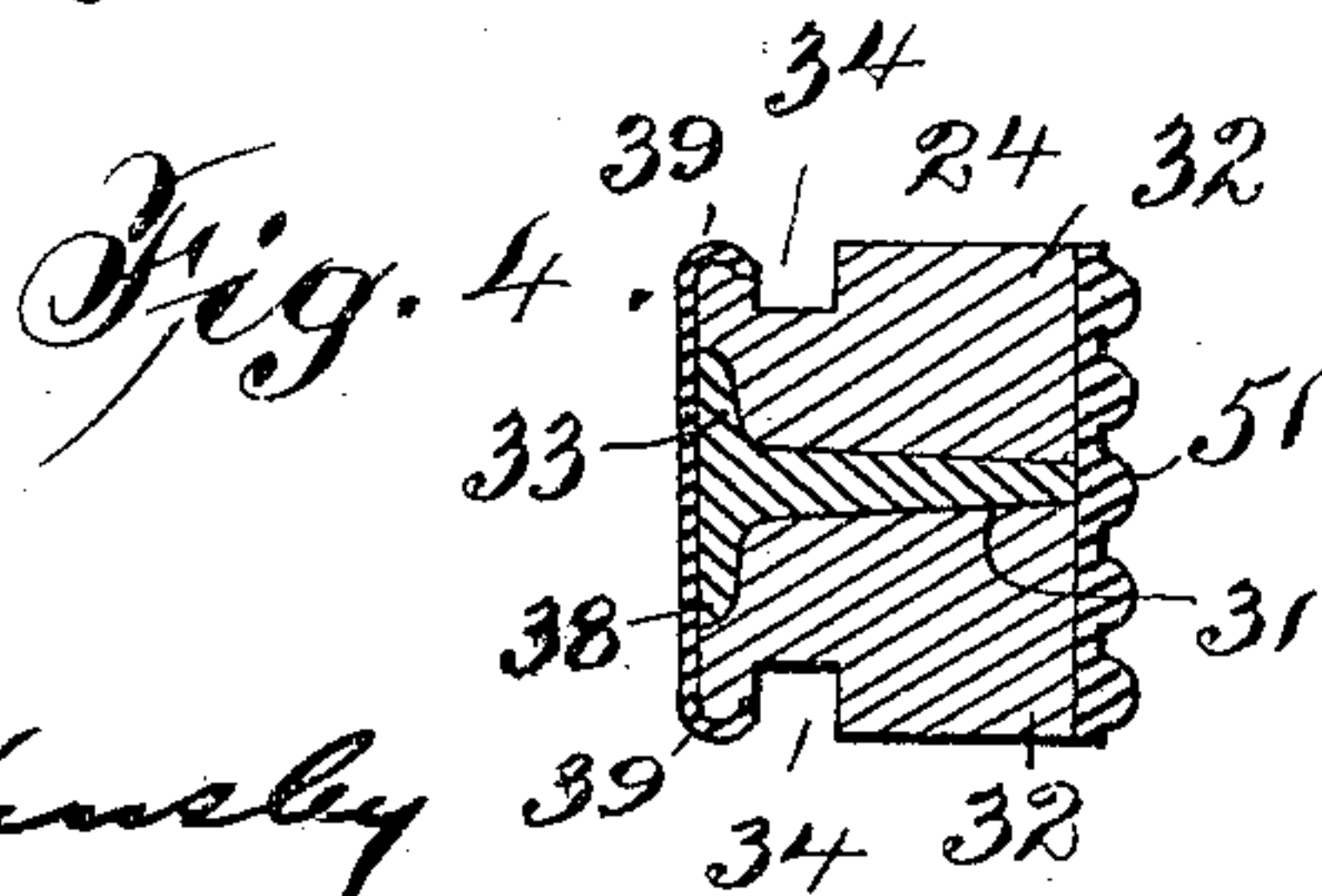
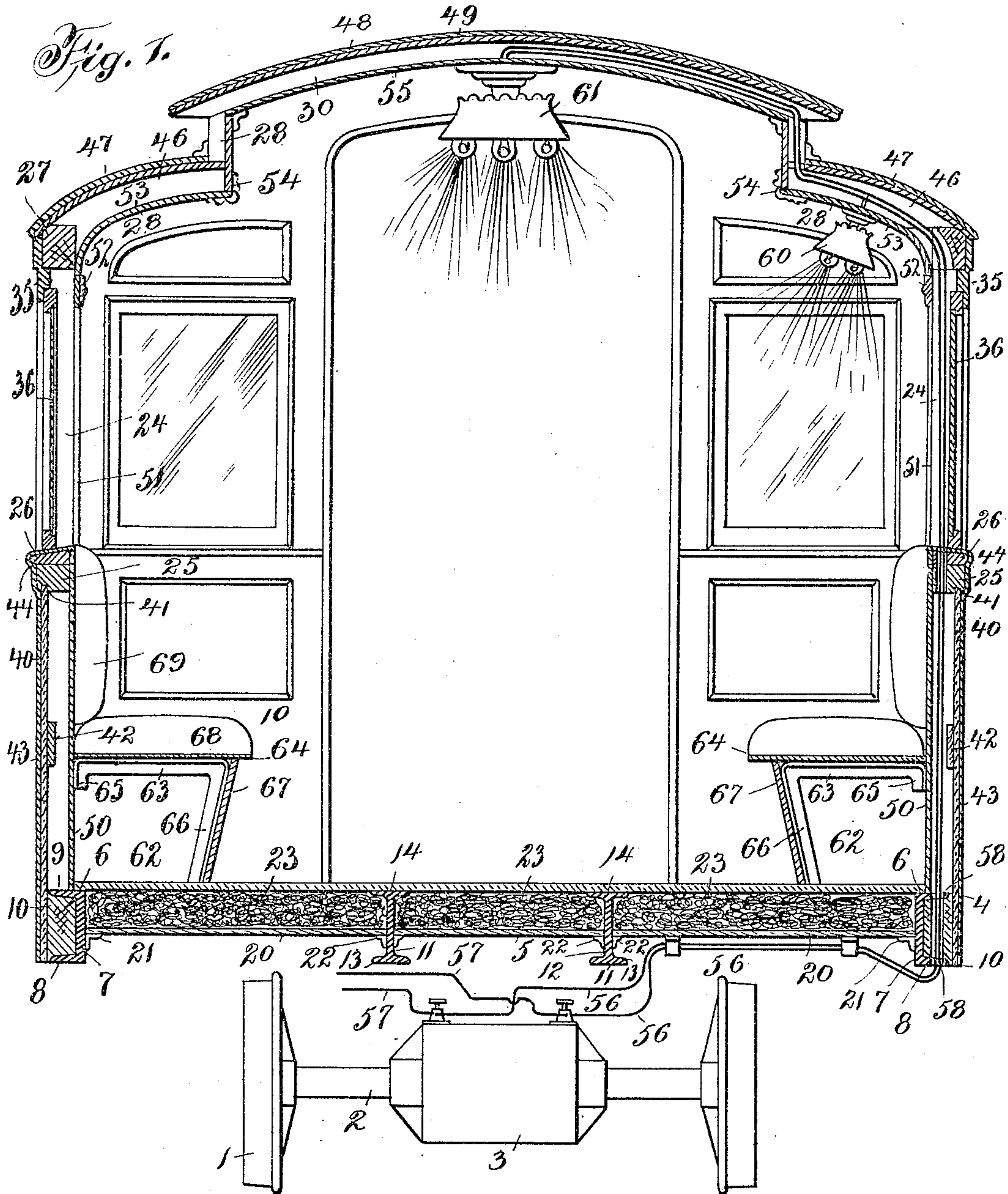
No. 784,298.

PATENTED MAR. 7, 1905.

G. M. BRILL.
CONSTRUCTION OF RAILWAY CARS

APPLICATION FILED NOV. 24, 1903.

3 SHEETS—SHEET 1.



WITNESSES:
Chas. Benjamin
Phas. Munsley

INVENTOR
George Martin Brill.
BY
Joseph L. Levy
his ATTORNEY

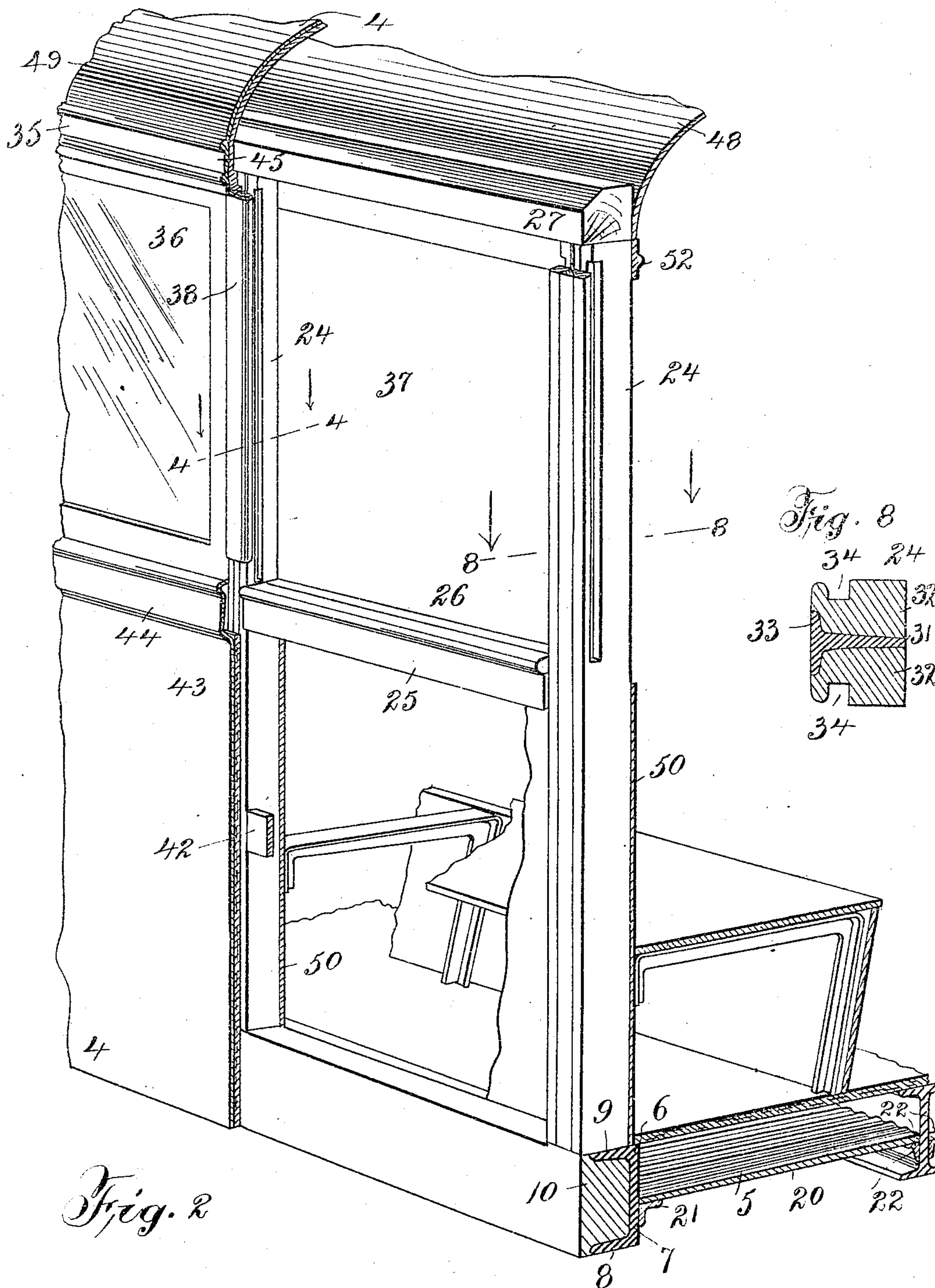
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Witnesses
C. W. Benjamin
Phas G. Newley

Inventor
George Martin Brill.
By his Attorney Joseph L. Gray

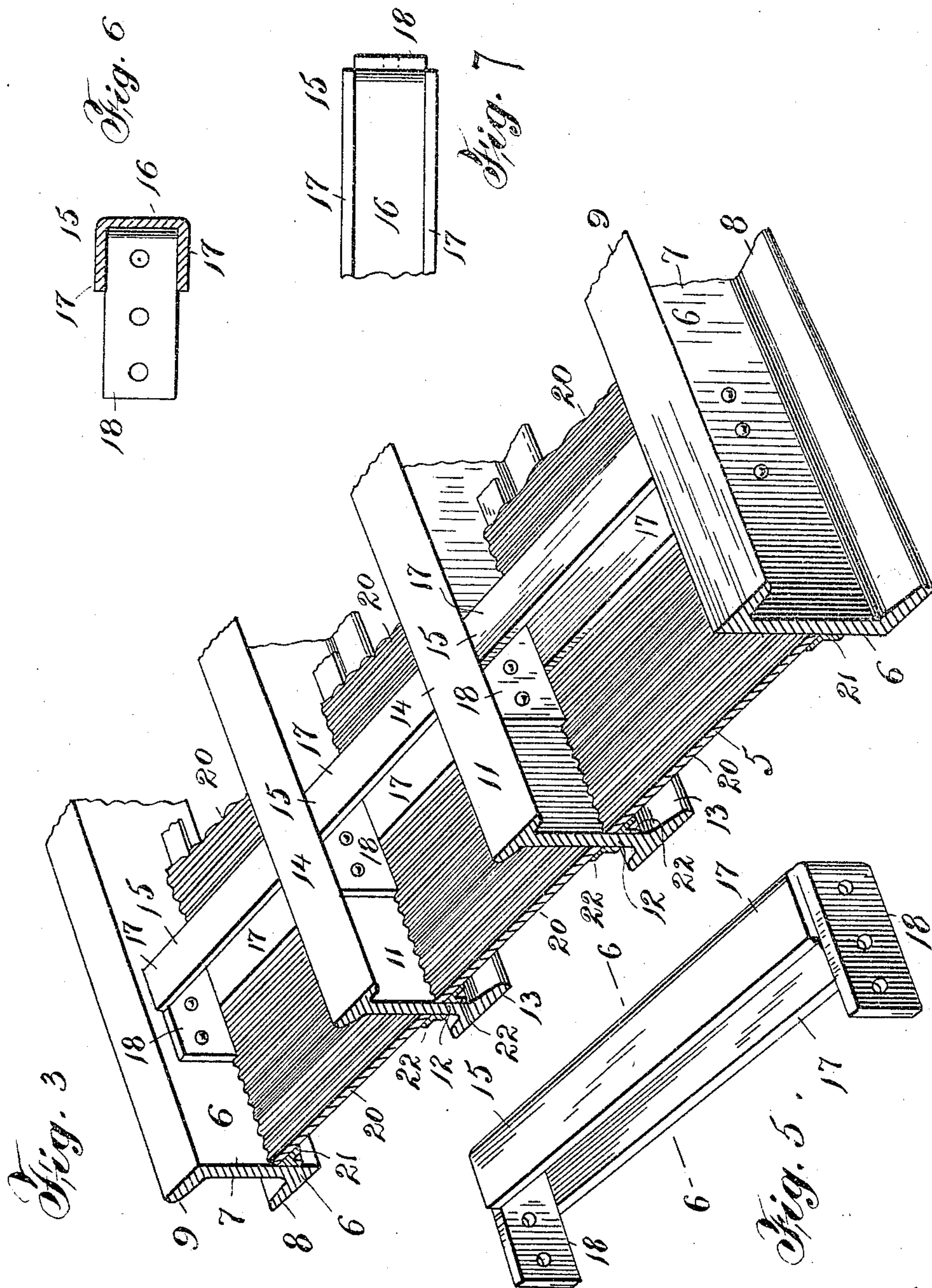
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3 SHEETS—SHEET 3.



Witnesses
C. W. Benjamin
Phas McNealey.

Inventor
George Martin Brill.
By his Attorney
Joseph L. Lury

UNITED STATES PATENT OFFICE.

GEORGE MARTIN BRILL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR
TO JOHN A. BRILL, OF PHILADELPHIA, PENNSYLVANIA.

CONSTRUCTION OF RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 784,298, dated March 7, 1905.

Application filed November 24, 1903. Serial No. 182,459.

To all whom it may concern:

Be it known that I, GEORGE MARTIN BRILL, a citizen of the United States, and a resident of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Construction of Railway-Cars, of which the following is a specification.

The object of the invention is to construct a car made generally of wood and other inflammable material—that is, having a wooden superstructure—so that it can be readily made practically fireproof during the course of its construction and which is especially adapted, with this idea in view, for use in connection with car-trucks carrying electric motors or any other form of motive power carried thereby wherein danger from ignition from the motive power may be likely, as in subways and tunnels. I accomplish these objects by constructing a car of wood and fire-resisting material and combining these materials so as to obtain a maximum of strength and minimum of weight and that the car cannot be easily set on fire from any source connected with the motive power, and yet utilize wood as much as possible in the car construction, especially in the framing, without departing from the conventional forms or methods of construction usual in the art of wooden car construction. In brief, I construct a car principally of wood and yet make it almost fireproof, and this result is accomplished with very little change in the standard designs and forms of wooden cars and car-frames.

In the operation of cars by electricity, and especially where the current is taken either from a conduit or third rail or by any other means located below the car-body, there is a constant present danger, due to the close proximity of the car-body to the electric motor of the truck, from “sparking” of the motor, from “short-circuiting” of the current, and otherwise, of producing a flame liable to be communicated to the car-body. This danger is also present when the motor or car-illuminating current passes through the car-body and in the operation of electrically-propelled cars where the overhead-trolley system is em-

ployed, since the short-circuiting or other causes of conflagration due to the interrupted passage of the current may take place below the car, on the truck, or at any point where the wires pass from the overhead trolley through the car to the truck or the wiring used for illuminating the car may be in sufficiently close proximity to the wood of the car to communicate the flame to it.

My invention therefore may be said to reside in three, among other, important features of improvement, as follows: The first is that I interpose between the body of the car and the truck upon which the motor is carried and between the source of electrical supply, which source is below the car-body, a fireproof septum, which preferably constitutes a component part of the car-body—viz., the body framing or flooring; secondly, without regard as to whether the body-framing of the car is made fireproof (but preferably with a fireproof framing or flooring) I utilize the car-body itself as a medium or conduit through which the car-wiring, whether said wiring is for the illumination of the car, derived from the vicinity of the truck, or whether the car-wiring is part of the overhead trolley through the car to the truck, making that part of the car itself of fireproofed material as distinguished from running the wires through the skin of the car and protecting them, and, thirdly, to generally construct the car-body as a unit (without departing from the general principles of construction) fireproof as to its framing—that is, “fireproof” in all the essential and necessary senses of that word or its requirements—that is to say, it is not necessary to the carrying out of my invention to provide a car which cannot be consumed by flame, it being sufficient for the purposes of my invention that the car-body be constructed sufficiently fireproof that the destruction of the car by fire will be delayed long enough to enable the passengers to get safely away and to generally protect it from flame at its most vulnerable points.

My invention further relates to certain novel features of construction, which enable a car to be more readily made fireproof, which, how-

ever, can be to a greater or lesser extent utilized in other car constructions, all of which will be hereinafter described, and finally pointed out in the claims.

5 In the drawings forming part of this specification, Figure 1 is a lateral cross-section of a car embodying my improvements, diagrammatically illustrating a truck, a motor, and wiring. Fig. 2 is a perspective view, enlarged
10 and partly in section, of a portion of the car-body. Fig. 3 is an enlarged perspective view showing a fragmentary portion of the body-framing. Fig. 4 is a cross-section on the line 4 4 of Fig. 2, enlarged, showing the construction of the side posts or stanchions in my
15 present embodiment. Fig. 5 is an enlarged perspective view of one of the crossing or lateral sills; and Fig. 6 is a cross-section on the line *xx*, Fig. 5. Fig. 7 is a side elevation
20 of the same. Fig. 8 is a section on the line 8 8 of Fig. 2.

In the drawings forming part of this specification I have illustrated an embodiment of my invention, and I desire to have it understood
25 that my improvements may be otherwise embodied without departing from the spirit thereof.

At 1 are the wheels, at 2 the axles, and at 3 a motor carried by the axle or otherwise supported upon the truck, the whole diagrammatically representing a car-truck of any desired construction with an electric motor supported thereon, adapted in any of the well-known ways to propel the truck and the car-
30 body mounted thereon or carried thereby.

At 4 is the car-body, which may or may not include the fireproof septum 5, which latter may be the body framing or flooring, the septum being generically designated by the
40 reference-figure 5. Therefore I shall hereinafter, unless otherwise noted, designate the car-body as that portion above the septum and the septum itself as a distinctive element interposed between the car-body proper and
45 the truck with its motor.

The car-body framing or flooring, specifically the fireproofed septum 5, is constructed as follows: At 6 are side sills, comprising the channel-beams, with the base-web 7 disposed vertically and the flanges 8 9 horizontally, and within
50 the channel of each of these beams, which are disposed outwardly, is located a wooden filling 10. Between the side sills are placed intermediate sills, consisting of I-beams 11, with
55 their compression-webs 12 vertically disposed and their flanges 13 14 horizontally disposed. The I-beams and the channel-beams, consisting of the main elements of the body framing or flooring, are tied together transversely intermediate of their ends by channel-iron cross-
60 ings 15, having the webs 16 17, the webs 17 being cut away and the ends 18 bent outward and secured to the vertical webs 7 12 of the channel and I beams. Upon the channel-beams

and the I-beams is laid the floor-planking 19, 65 preferably of wood made fireproof in any desired or preferred manner, as by treating it with alum.

At 20 are corrugated metal sheets, with the corrugations extending transversely and extending underneath the floor-planking, preferably continuously therewith. These corrugated metal sheets are secured between the channel-beams or side sills 6 and the I-beams 11 by angle-irons 21 22, secured to these parts, respectively, upon which the corrugated iron sheets rest and to which they are secured, a space being thereby formed between the floor-planking and the sheets, in which is placed a non-inflammable or fireproof material 23, such
80 as mineral wool, which prevents the fire which may have heated the underlying sheets 20 being communicated to the floor-planking. In this way any heat or flame coming from either the source of electric supply or from the motor or from the motor-wiring will be prevented from either destroying the car-body or being
85 communicated thereto.

It is clear that instead of constituting the septum as a component part of the car-body it may be separately added to the body. 90

The superstructure of the car illustrating an embodiment of my invention is constructed as follows: At 24 are the side posts or stanchions, preferably constructed as hereinafter described, at 25 26 the longitudinal beams constituting the belt-rail, and at 27 the top rail or deck sills, between which and the sills 6 the side posts or stanchions 24 extend. From the top of the posts extend inwardly the lower-deck carlines 28, from the inner end of which extend upwardly the ventilator-rails, upon which are superposed the upper-deck carlines 30. 95

Instead of forming the car posts or stanchions 24 in the usual way, as wholly of wood, I prefer to build them up so as to secure strength in construction and to permit the fireproofed or fire-resisting material to be secured thereto and to form frames or casings for the window-frames, and preferably to construct them partly of wood and partly of iron. As shown in Fig. 4, they comprise the central upright T-iron extending from the sills 6 to the top rail 27 and the wooden sections 32, fitting in around the two sides of the T-iron and resting against its web 31 and receiving the outwardly-disposed flanges 33 in the side faces of wooden sections. Grooves 34 are formed, extending from the top of the belt-rail 25 26 to the letter-board 35, (secured to the top rail 27 and lying exterior of the posts,) to receive the frame or sash 36 of the top window 37, in which grooves the frame is secured. The window sash or frame may be made sectional and a plurality of grooves provided for it. 105 110 115 120 125

I desire to have it understood that I prefer

that all the wood or other inflammable material employed in the construction of the car be treated with fireproof material, as alum, or otherwise made substantially fireproof and where such wood or other inflammable material is exteriorly exposed that it shall be further fireproofed or protected, as hereinafter described.

The outer exposed surface of the wooden sections of the posts is covered by a strip 38 of sheet-iron, which also covers the flange 33 of the T-iron as well, the strip being turned in at the edges 39.

The exterior skin of the car, in addition to the post-covering, consists of the lower paneling, comprising a section 40 of fireproofed wood extending between a groove 41 in the base 25 of the belt-rail and the wooden filling 10 of the side sills 6 and supported between the sills and the belt-rail by the longitudinal strips 42, extending between the posts, which wooden section of the paneling is covered on the exterior with a sheet 43 of iron extending up to the belt-rail. The exposed surface of the belt-rail is also, preferably, covered with sheet-iron 44 or fireproofed material and which extends into the window frame or sash.

The outer surface of the letter-board 35 (which is recessed to receive the top rail 27) is also covered with sheet-iron 45, and extending between the top of the letter-board, over the top rail and to the ventilator-rail 29, and laid upon the lower-deck carlines 28 is the lower decking or roofing 46, which also is covered with sheet metal 47.

The ventilator-rail, which is also fireproofed, supports the upper-decking-carlines 30, the latter in turn the upper-deck roofing 48, which latter is covered, preferably, by galvanized-iron sheeting 49, and all of the before-mentioned exterior sheeting is preferably of the latter material.

Interiorly the base-panels are provided with a sheet of metal 50, extending from the horizontal flanges 8 of the channel-beams 6 up to the top of the belt-rail, so as to protect the latter and the posts and form a fireproofed backing for the car-seats, to be hereinafter described.

The inner exposed surface of the posts is covered with moldings 51, made of fireproofed material, preferably molded asbestos formed while in a plastic condition about a wire or other suitable frame in the usual way, Fig. 4, and from a longitudinal asbestos molding 51 52 and to the outer end of the lower-deck 28 extend sheets 53 of asbestos-board, which form the inner lining of the lower deck, and from the termination of the inner lining, running inside the ventilator-rails and up to the upper-deck carlines, are further sheets 54 of asbestos-board, and the upper-deck lining 55 is also of the same material, all secured to their re-

spective adjacent parts, which latter are fireproofed.

The ends of the car are formed in the same way—that is to say, the wood is fireproofed, covered exteriorly with sheet-iron, and, if necessary, lined interiorly with asbestos-board, although the latter is not absolutely essential, for the reason that the fire is generally communicated either from below exteriorly, from the sides exteriorly, or from the exterior of the roof.

I have described the construction of the sides of the car with considerable particularity, for the reason that such construction enables the car-wiring 56 56 to be run up through a fireproof conduit formed by a component part of the car, which in itself is made fireproof. In other words, the wiring 56 from the motor (or from a source of supply 57 and to and through the motor or otherwise) in the embodiment shown herein may extend through holes 58, formed in the flanges 8 9 of the side-sill channel-beams and the filling 10, through the space between the metal sheet 50 and the outer sheeting 40 43 of the lower paneling, through a hole 59 in the fireproofed belt-rail and its sheeting, along the posts, and covered (or it may extend up in a recess formed in the post, with the wires permanently located there during the construction of the car,) through the fireproofed space formed between the lower decking 46 and lining 53, and between the upper-deck roofing 48 and the head-lining 55, and taken at desired points to the lamps 60 61, as indicated.

Should a car employing my improvements be used in an overhead-trolley system, the wiring can be taken from the trolley through the fireproofed channel or conduit thus formed in the body of the car and led to the lighting system and finally to the motor in substantially the same way.

Following out the scheme of fireproofed construction, I have provided seats which form suitable supports for the seat-cushions and at the same time prevent entry of flame from without into the interior of the car or from within outwardly. To carry this out, I employ the brackets 62, having horizontal arms 63, supporting a sheet-metal or asbestos top-board 64 and having downwardly-bent ends 66, supported upon the car-flooring 19 and incased with the longitudinally and inwardly disposed face-boards 67 of asbestos.

The cushions and backing 68 69 may be made up of an outer covering 70, of fireproofed material, stuffed with hair, or, if desired, other fireproofed material, such as fine mineral wool, and provided with springs, the cushions 68 being seated on the plate 64, the backing being secured against the inner panel-plate 50.

It will be apparent from the foregoing that

the three and important features of my invention, as well as the various details of improvement herein described, may be variously embodied without departing from the spirit
5 of my invention.

Having described my invention, I claim—

1. A car-body having a fireproofed body-frame, and a body structure superposed upon said frame having an exterior sheathing of
10 iron, a wooden framework over which said sheathing is laid, the woodwork being fireproofed, and an interior lining of asbestos.

2. In a car, the combination with a body-frame comprising longitudinal metallic sills
15 consisting of channel-beams each having a wooden filling, a fireproof filling interposed between the sills, a body erected over the flooring comprising posts supported upon the sills, and an outer base-paneling secured to
20 the sill-flooring.

3. In a car, the combination with a body-frame, of a car-framework, erected upon the body-frame comprising wooden posts and ribs, said car-framework being treated with fire-
25 proofed material, and an exterior fireproof sheathing.

4. In a car, the combination with a body-frame, of a car-framework erected upon the body-frame, comprising wooden posts and
30 ribs, said car-framework being treated with fireproof material, an exterior fireproof sheathing and an interior fireproof lining, the sheathing and lining incasing the said car-framework.

5. In a car, the combination with a body-frame, consisting of a fireproof structure, of a car-framework, erected upon the body-frame comprising wooden posts and ribs, a
35 wooden exterior covering therefor, and a fireproof sheathing laid over the wooden covering.
40

6. In a car, the combination with a body-frame consisting of longitudinal metallic sills and interposed fireproof material, of a car-
45 framework upon the body-frame comprising wooden posts and ribs, a wooden exterior covering therefor, and a fireproof sheathing laid over the wooden covering.

7. In a car, the combination with a body-frame, consisting of a fireproof structure, of a
50 car-framework erected upon the body-frame comprising wooden posts and ribs, said car-framework being treated with fireproof material, and an exterior fireproof sheathing.

8. In a car, the combination with a body-frame, consisting of longitudinal metallic sills and interposed fireproof material, of a car-
55 framework erected upon the body-frame comprising wooden posts and ribs, said car-frame-
60 work being treated with fireproof material, and an exterior fireproof sheathing.

9. In a car, the combination with a body-frame consisting of a fireproof structure, of a car-framework erected upon the body-frame

comprising wooden posts and ribs, said car-
65 framework being treated with fireproof material, an exterior fireproof sheathing, and an interior fireproof lining, the sheathing and lining incasing the car-framework.

10. In a car, the combination with a body-
70 frame consisting of longitudinal metallic sills and interposed fireproof material, of a car-framework erected upon the body-frame comprising wooden posts and ribs, said car-frame-
75 work being treated with fireproof material, an exterior fireproof sheathing, and an interior fireproof lining, the sheathing and lining incasing the car-framework.

11. In a car-body, the combination with the longitudinal sills comprising the channel-beam
80 side sills, the I-beam intermediate sills, of the cross-sills comprising channel-beams having bent ends secured to the upright webs of the channel and I beams, and metallic plates sup-
85 ported between the longitudinal sills.

12. In a car-body frame, the combination with the side and intermediate longitudinal
90 sills, of the cross-sills, and continuous metallic plates secured to and between the longitudinal sills.

13. In a car-body frame, the combination with the flanged side and intermediate longi-
95 tudinal sills, of the cross-sills and metallic plates secured to and between the flanges of said sills.

14. In a car-body frame, the combination with the side and intermediate longitudinal
100 sills, of the channel-iron cross-sills extending between and secured to the longitudinal sills with their channels horizontally exposed, and metallic plates extending between and sup-
ported by the longitudinal sills adjacent the cross-sills.

15. In a car-body frame, the combination with the side and intermediate longitudinal
105 sills, of the metallic plates extending between and supported by the longitudinal sills, and the channel-beam cross-sills secured to the longitudinal sills over the said plates.

16. In a car-body frame, the combination
110 with the side and intermediate longitudinal sills, of the angle-irons secured to said sills, the metallic plates secured upon said angle-
115 irons, and cross-sills extending between and secured to the longitudinal sills over said plates.

17. In a car-body frame, the combination with the side and intermediate longitudinal
120 sills, of the angle-irons secured to said sills, the metallic plates secured upon said angle-
125 irons, and the channel-beam cross-sills secured to and extending between the longitudinal sills over said plates, their channels being horizontally exposed.

18. In a car-body frame, the combination
125 with the side and intermediate longitudinal sills, of the corrugated metallic plates secured to and extending between said sills with their

corrugations transversely disposed, and cross-sills tying the longitudinal sills together transversely.

19. A car-body frame, comprising in combination the metallic side and intermediate longitudinal sills, the metallic cross-sills, metallic plates secured to and extending between the longitudinal sills below the cross-sills, and a fireproof filling material laid upon the said plates between the said sills.

20. A car-body frame, comprising in combination, the metallic side and intermediate longitudinal sills, the metallic plates secured to and extending between the longitudinal sills, the channel-beam cross-sills with their channels horizontally exposed extending between the longitudinal sills, and a fireproof filling material laid upon said plates, between said sills, and within said channel.

21. The cross-sill comprising the channel-beam having the web 16, the flanges 17, extending at an angle from the web 16, and the end 18 separated from the web 16 and extending from the web 16 parallel with the ends of the flanges.

22. In a car, the combination with the body-frame, comprising the channel-iron longitudinal sills having the interposed wooden filling, a car-flooring erected over the body-framing and comprising posts, ribs and longitudinal belt-rail, said posts being supported upon the longitudinal sills, and a base-paneling comprising the panels 40 extending between the belt-rail and the outer face of the sill-filling, and a sheathing 43, 44, covering the panels 40 and belt-rails.

23. In a car, the combination with the body-framing comprising the channel-beam longitudinal sills having the exteriorly-exposed wooden filling, the car-frame erected upon the body-frame comprising posts supported upon the said sills, ribs, and longitudinal belt-rails, and a base-paneling comprising the paneling 40 extending between the belt-rails and outer face of the sill-filling and the sheathing 43, 44 covering the panel 40 and belt-rails.

24. In a car, the combination with the body-framing comprising the channel-beam longitudinal sills, having the exteriorly-exposed wooden filling, the car-frame erected upon the body-frame comprising posts supported upon the said sills, ribs and longitudinal belt-rails, and a base-paneling comprising the paneling 40 extending between the belt-rail and sill-filling, and the sheathing 43, 44 covering the paneling 40 and the belt-rails, and the inner lining 50 extending between the channel-beam sill and the inner face of the belt-rails.

25. In a car, the combination with the body-frame, and a car-frame erected thereon, comprising the posts, the ribs, the longitudinal belt-rails, the longitudinal top rails, and ribbing erected from the top rail upwardly, decking supported upon the ribs, the metallic sheathing covering the decking supported

upon the ribs, the metallic sheathing covering the decking, base-paneling extending between the belt-rails and the body-frame, a metal sheathing covering the base-panel exteriorly, metallic sheathing covering the exterior of the posts, an inner lining supported by said ribs below the decking comprising asbestos sheeting, asbestos lining for the inner faces of the posts, an inner lining for the base-paneling comprising plates extending between the belt-rail and the body-frame.

26. In a car, the combination with the body-frame, of a car-frame comprising the posts, the ribs extending from the posts upwardly, said ribs being made of wood treated with fireproof material, a decking laid over ribs exteriorly, a metallic sheathing laid over the decking, asbestos plating secured to the inner surface of the ribs and extending to the posts, and forming an interior fireproof protection to said decking or roof.

27. In a car, the combination with the body-frame, and a car-frame erected thereon comprising posts and ribs extending upwardly from the posts, and belt-rails, the base-paneling extending between the belt-rails and body-frame, and interior fireproof base-panel extending between the body-frame and the belt-rails, and car-seats supported against and adjacent to said interior panels.

28. The combination in a car, of the body-frame, the car-frame erected thereon, the latter comprising in its construction the longitudinal belt-rails, an inner base-paneling comprising metallic plates extending between the belt-rails and the body-frame, supports for seats ranged adjacent the inner base-paneling, a fireproof plate supported upon said seat-support, cushions supported upon said plate, and further cushions supported against the lower paneling.

29. In a car, the combination with the body-frame, the car-frame erected thereon and comprising the longitudinal belt-rail, the fireproof base-panel extending between the interior frame of the belt-rails and to the body-frame, and a seat-frame supported upon the body-frame adjacent the inner base-panel, a fireproofed plating disposed upon the said frame, a further fireproofed plating extending from the horizontal plating to the body-frame and inclosing the seat-frame, and cushions supported upon the horizontal plating.

30. A car-post comprising the wooden sections 32, the interposed metallic bar, grooves 34 formed in the faces of the wooden sections, and the sheathing 38 covering the outer exposed faces of the bar and wooden sections.

31. A car-post comprising the wooden sections 32, the interposed metallic bar, grooves 34 formed in the faces of the wooden sections, and the sheathing 38 covering the outer or exposed faces of the bar and wooden sections, the inner faces of the posts being covered by the fireproof lining 51.

32. A car-post comprising the T-iron having its flanges 33 outwardly exposed, the wooden sections 32 seated within the said flange and abutting against its web 31, grooves formed in the side faces of the wooden sections, and the sheathing 38 extending over the outer surface of the flange 33, the corners of the wooden sections and to said grooves.

33. A car-post comprising the T-iron having its flanges 33 outwardly exposed, the wooden sections 32 seated within the said flange and abutting against its web 31, grooves formed in the side faces of the wooden sections, and the sheathing 38 extending over the outer surface of the flange 33, to and over the corners of the wooden sections to said grooves, and the inner fireproof lining 51.

34. A car having window frames or sashes, and a support for said sashes comprising the longitudinal top rail, a letter-board secured to the top rail, posts extending between the belt-rail, the letter-board and top rail, grooves formed in the side faces of the posts and receiving said sash, a metallic sheathing covering the exposed faces of the post and extending to the window-sash, a metallic sheathing covering the belt-rail and extending to the window-sash, and a metallic sheathing covering the top rail and the letter-board and extending to and adjacent the window-sash.

35. A car, the combination with the body-frame, the car-frame, the longitudinal belt-rail, the inner sheathing 50 extending between the belt-rail and the body-frame, a seat comprising the frame 65 secured to the lining 50,

the horizontal section 63, the upright section 66 supported upon the body-frame, the plate 64 supported upon the horizontal section 63, cushions supported upon the plate 64, and the plate 67 extending between the plate 64 and the body-frame in front of the seat-frame.

36. In a car, the combination of a body-frame, a car-frame provided with angle metal sills, corrugated metal sheets joining the central webs of said sills, and an asbestos filling resting on said corrugated sheets and between said sills.

37. In a car or similar vehicle, a car-frame provided with angle metal sills, angle-irons extending along said sills, corrugated metal sheets resting on said angle-irons, and an asbestos filling resting on said sheets and a floor resting on said sills.

38. In a car, the combination with a truck and superposed car-body having a wooden superstructure comprising posts and a wooden shell, and an electric motor supported on said truck, and longitudinal walls formed of angle metal united by a fireproof septum, consisting of asbestos resting on corrugated metal, whereby the motor and truck are separated from said wooden superstructure.

Signed in the city and county of Philadelphia, State of Pennsylvania, this 19th day of November, 1903.

GEORGE MARTIN BRILL.

Witnesses:

H. A. HEULINGS,

WM. J. FERDINAND.