

(No Model.)

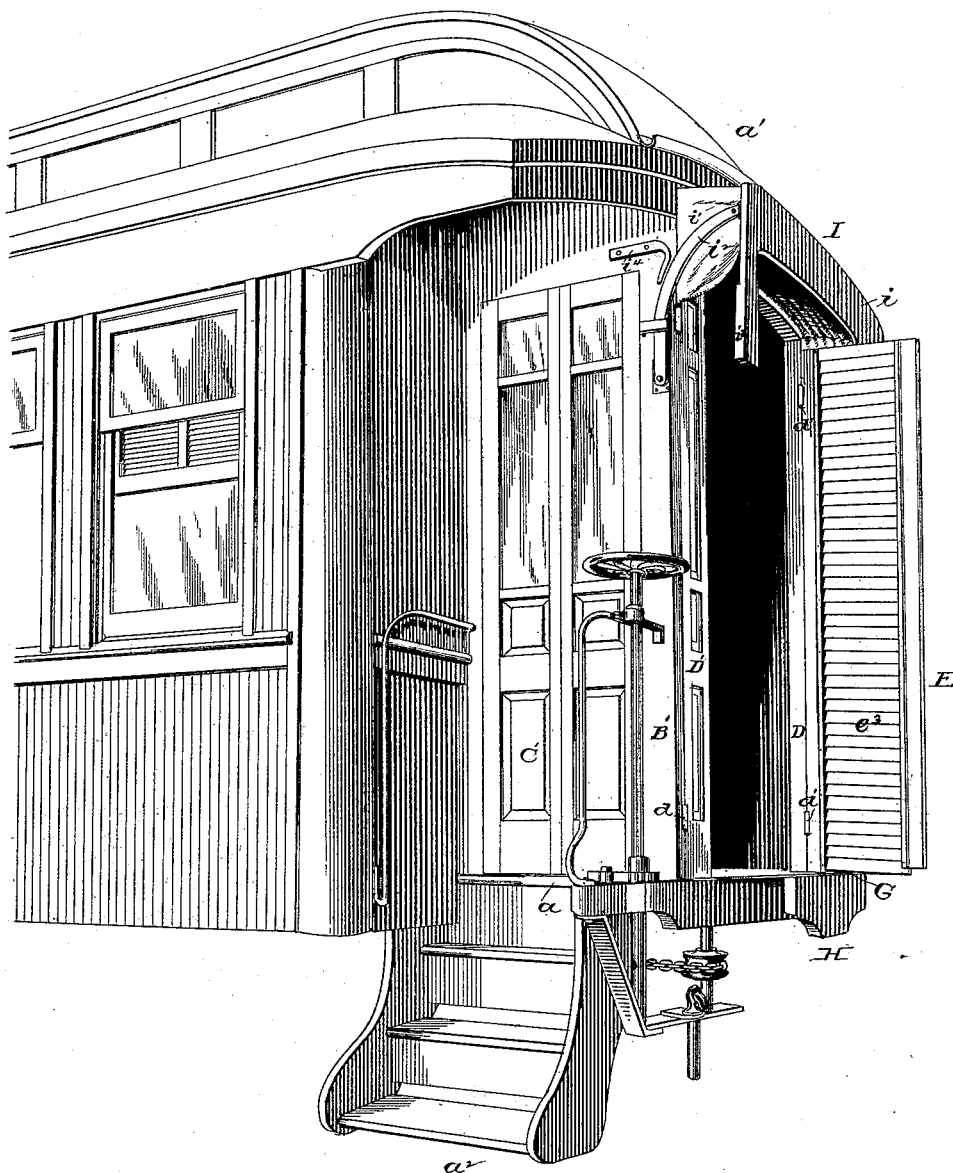
5 Sheets—Sheet 1.

J. N. BARR.  
RAILWAY CAR.

No. 421,376.

Patented Feb. 18, 1890.

*Fig. 1.*



Witnesses:  
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By his Atty.  
*Phil. T. Dodge*

(No Model.)

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Fig. 2.

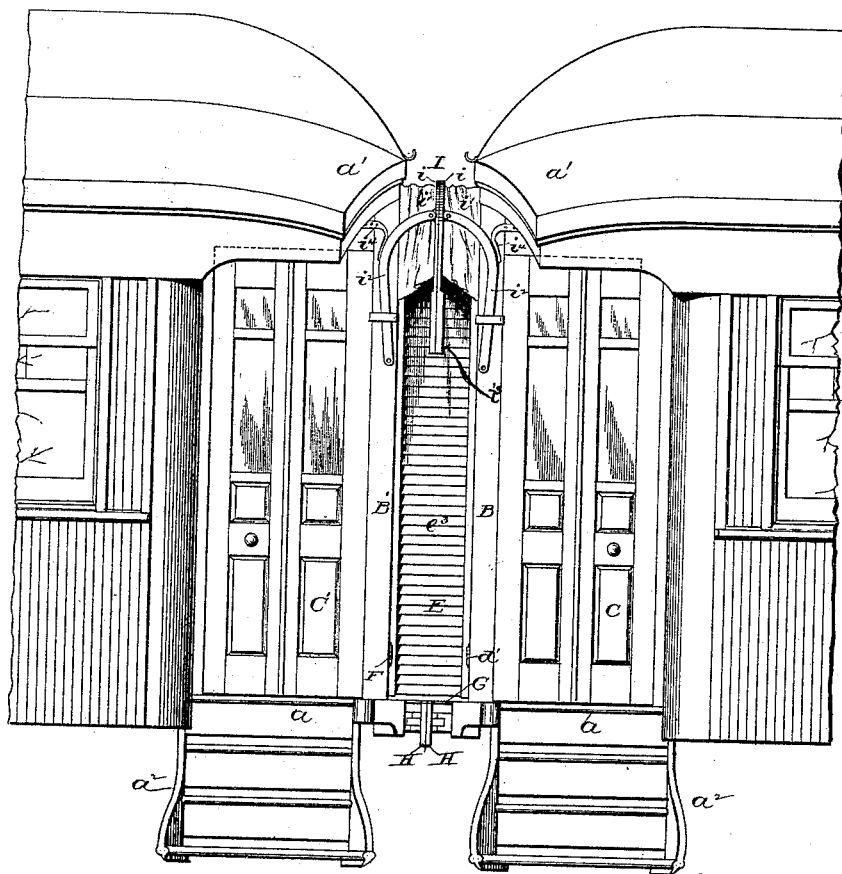


Fig. 7.

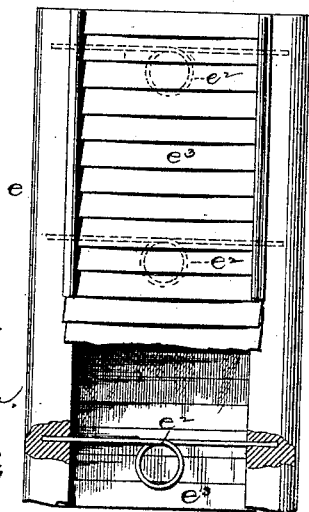


Fig. 8.



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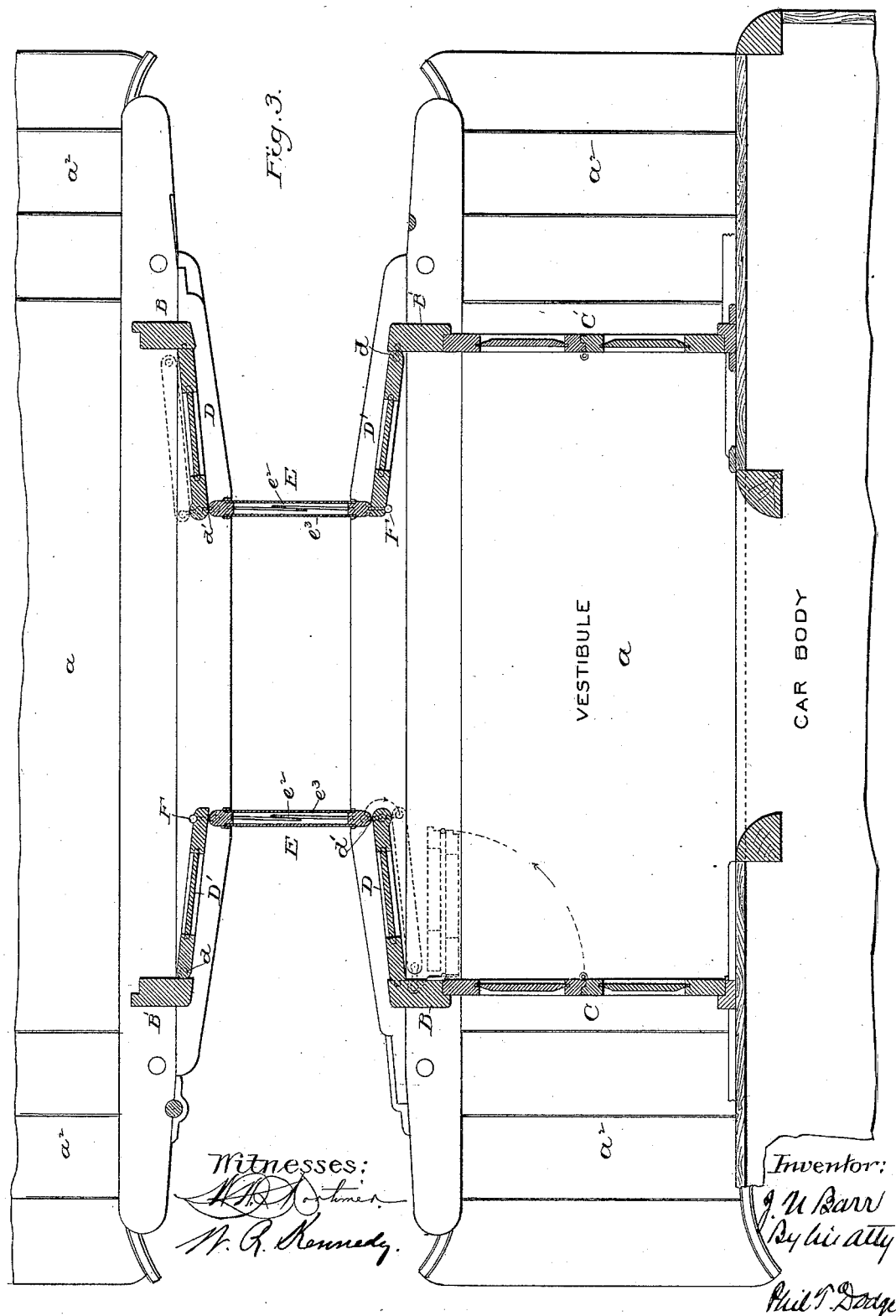
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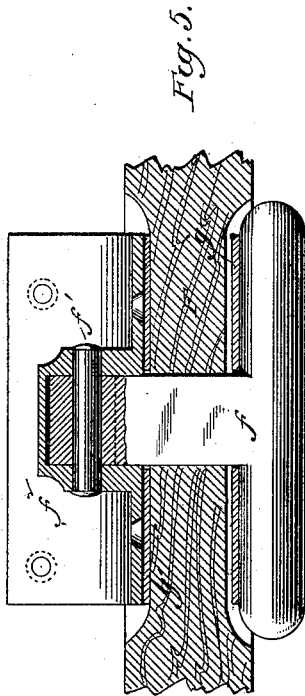


Fig. 5.

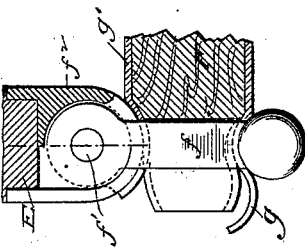
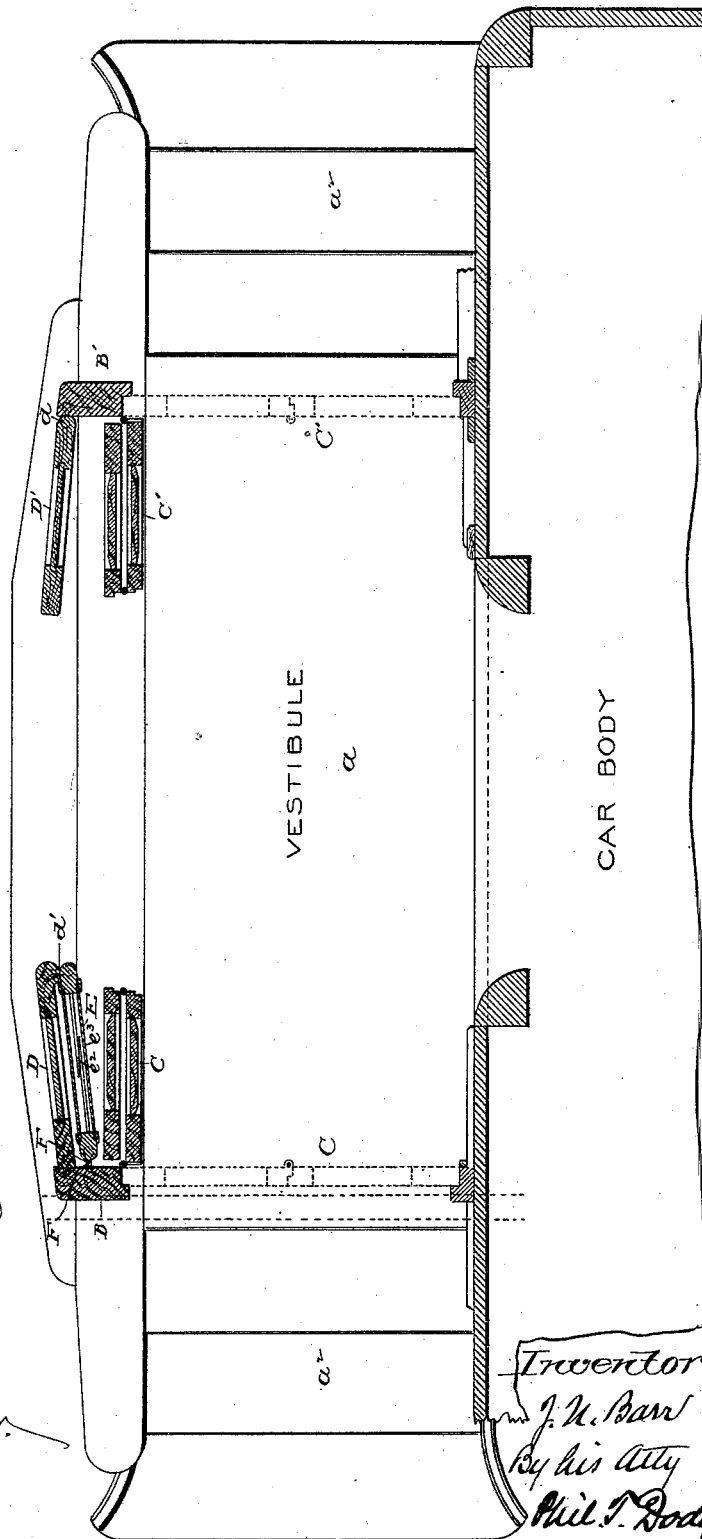


Fig. 6.

Fig. 4.



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(No Model.)

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Fig. 9.

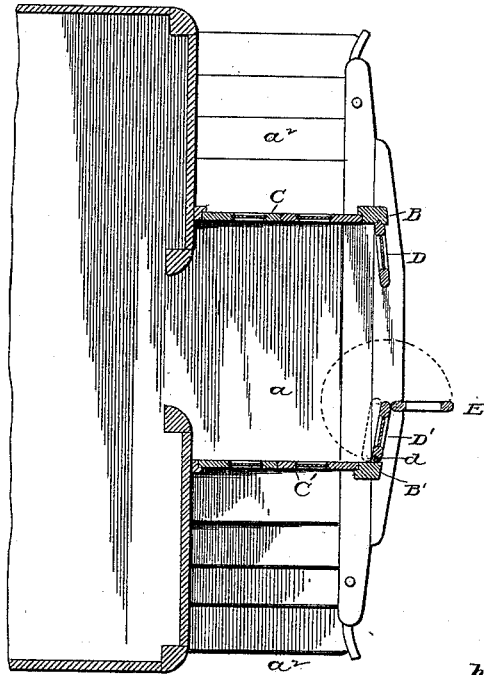


Fig. 11.

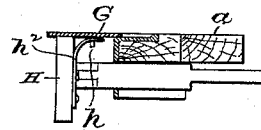
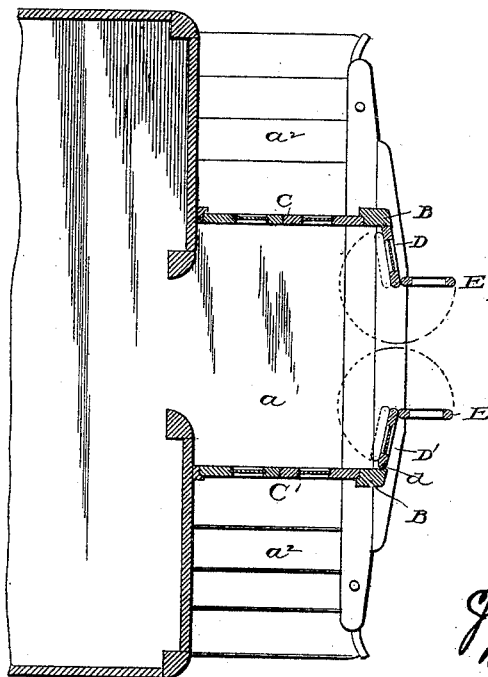


Fig. 10.



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# UNITED STATES PATENT OFFICE.

JACOB N. BARR, OF MILWAUKEE, WISCONSIN.

## RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 421,376, dated February 18, 1890.

Application filed November 15, 1889. Serial No. 330,412. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB N. BARR, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain Improvements in Railway-Cars, of which the following is a specification.

My invention has reference to what are now known in the art as "vestibule-cars," in which a compartment or vestibule at the end of each car is provided with horizontally-extensible connections, by means of which and corresponding connections on the adjacent car an inclosed passage-way may be established from one car to the other; and the invention consists in an improved construction and arrangement of parts to this end, as will hereinafter appear in detail.

In the accompanying drawings, Figure 1 is a perspective view of a railway-car provided with my improvement in its preferred form. Fig. 2 is a side elevation showing my improved cars coupled together. Fig. 3 is a horizontal section through the ends of the coupled cars. Fig. 4 is a horizontal section through one end of the car, showing the manner in which the vestibule-connections are folded out of the way when not in use. Figs. 5 and 6 are respectively a side view, partly in section, and a top plan view, partly in section, of one of the couplings or connections for the vestibule-extension. Fig. 7 is a side elevation, on an enlarged scale, of a detail. Fig. 8 is a horizontal section through the same. Figs. 9 and 10 are modifications. Fig. 11 is a vertical longitudinal section through the outer end of the platform, the buffer, and the threshold-plate carried thereby.

In carrying my invention into effect the car may be constructed, as usual, with a projecting platform *a*, a stationary hood *a'*, overhanging the platform, and wide steps *a''*, leading therefrom. At the outer corners of the platform, extending thence to the roof, I erect the stationary corner-posts *B B'*, and to these posts I hinge horizontally-swinging doors *C C'*, closing against cleats or other supports on the end of the car-body, completely closing the space at the sides of the platform, so as to produce a vestibule. Cars having the platform-space thus inclosed at the sides and top are commonly known in the art as "vestibule-cars," and it is with this

meaning that the expression is hereinafter used. Each of the side doors *C C'* is preferably constructed, as shown, of two vertical halves hinged together, in order that it may fold, when open, into compact form over the end sill of the car, as shown in dotted lines.

To the respective corner-posts *B B'*, I connect vertical wings or doors *D D'*, extending inward transversely of the car a suitable distance to leave between their inner vertical edges a passage for passengers. The wing *D* on one side may be fixed rigidly in position, as shown; but the wing *D'* at the opposite side has its outer edge supported on vertical pivots or hinges *d*, adapted to permit the inner or free edge to vibrate horizontally to a limited extent in the direction of the length of the car—that is to say, to and from the adjacent car.

To the end of the fixed wing *D*, I connect by swinging links *d'*, hereinafter described, a vertical door *E*, which may be swung outward at right angles to the end of the car, so as to span the space between the two cars and be connected at its free edge with the swinging wing *D'* of the opposite car, or when not in use turned inward and folded against the inner face of the wing *D*, as shown in dotted lines in Fig. 3 and full lines in Fig. 4.

The hinge or link connections *d'*, by which the doors *E* are sustained, may be of any construction which will admit of the doors swinging horizontally. It is preferred, however, to employ the links *d'*, each connected at one end by a vertical pivot to the supporting-wing *D*, and at the opposite end by a vertical pivot to the door *E*, as shown in the several figures, the edges of the doors being curved in the arcs of circles described from the respective pivots, whereby the door is permitted to swing and to fold in the manner described, while at the same time a close joint is maintained between the rounded edges.

I provide each of the doors *E* at its outer or free edge with a coupling or connection *F*, by which it may be secured when in use to the free edge of the swinging wing *D'* of the opposite car. I recommend the employment of a connection such as shown in Figs. 3 and 4 and in detail in Figs. 5 and 6, consisting simply of a T-shaped arm *f*, connected by a vertical pin *f'* to a stationary plate *f''*, seated

in the edge of the door E. The wing D' is notched horizontally in its edge, so that the arm *f* may be turned therein, with its vertical end seated against the inner or rear face of the wing. Flat spring-arms *g* and *g'* are applied to opposite faces of the wing E, as shown in Fig. 6, to prevent the accidental separation of the coupling; but these springs are not intended to and do not resist the strain.

It is to be noted that the edge of the door is seated firmly against the wing D', and that the end of the connecting-arm *f* is seated firmly against the opposite side of the wing.

It is to be observed that the wings D and D' at the ends of the respective cars and the intervening doors E form secure and tight vertical connections between the cars, effectually closing the ends of the vestibules or platform-spaces and the sides of the central passage.

End motion of the cars in relation to each other is permitted by the swinging motion of the wings D' around the pivots at their outer edges. Any slight lateral motion of the cars in relation to each other is permitted by the vertical axes at the edges of the connecting-doors E.

It will be observed that the passage-way is closed on one side by the door of one car and on the opposite side by the door of the other car, so that if the doors E are hung upon the same side—for example, the right side of the passage of all cars—any two cars in the line may be coupled together.

While it is preferred to hinge the connecting-doors to the fixed wings D, they may, if preferred, be hinged to the edges of the movable wings D', and coupled, when in use, to the fixed wings of the opposite car, as shown in Fig. 9; or the wings D and D' of both cars may be mounted on vertical pivots or hinges to swing horizontally.

While under all ordinary conditions it is sufficient to provide each car with a single door E, it is sometimes advisable to provide each car with two doors on opposite sides of the central passage-way, as shown in Fig. 10, so that a passage-way may be established between a car provided with my device and a car which is without such attachment.

Vertical motion between the two cars may be permitted by allowing sufficient vertical play between the wings and doors or the wings and the body of the car; but as this vertical play is ordinarily objectionable I propose to construct the doors E in such manner that their two stiles may move vertically in relation to each other, so as to follow the motion of the respective cars. The preferred construction to this end is that shown in Figs. 7 and 8, in which *e e'* represent the two vertical stiles connected by transverse springs *e<sup>2</sup>*, each consisting of an elastic rod coiled at the middle and fixed at the ends in the stiles, and *e<sup>3</sup>* represents canvas or other flexible material fixed at its opposite ends to the stiles and spanning the space between them. This

flexible material is preferably plaited, as shown, to give greater flexibility. The essence of the invention in this regard consists in connecting the stiles by springs or jointed connections of any suitable character which will permit one to rise and fall in relation to the other; and it is to be understood that these connections may be modified to any extent within the range of mechanical skill, and that the intermediate covering used to exclude the dust and rain and produce a tight door may be of any appropriate material and applied in any manner which will not interfere with the vertical motion of the stiles.

The parts above described provide, of course, only for the closure of the passage between the cars at its sides. It may be closed at the bottom by a sill or platform of any appropriate construction and at the top by any appropriate canopy or covering; but I prefer to provide each car with a threshold-plate G, laid loosely on top of and sustained by the platform-buffers H H'. Each of these plates has a depending pin or stud *h*, engaging an upright spring-arm *h<sup>2</sup>*, fixed at its lower end to the center of the buffer. By these arms the two plates which stand edge to edge are kept in contact, notwithstanding the changes which occur in the relation of the cars to each other.

In order to cover and close the passage-way, I commonly provide two co-operating hoods or canopies I, attached one to each car. These hoods consist of a suitable face plate or frame *i*, having a flat vertical face connected around its outer edge to the car by the intervening flexible material *i'*—such as sheet canvas or rubber—which is tacked or otherwise fastened to the end of the car-body. Each canopy has its face-plate sustained independently at the two ends by arms *i<sup>2</sup>*, which are jointed at their upper ends to the face-plate and at their lower ends to the side of the car-body. It will be observed that there is a single link at each side of the face-plate, and that the latter is provided at the lower end with a weight *i<sup>3</sup>*, which serves to maintain it in an upright position. This connection permits each hood or canopy to be extended to a greater or less distance beyond the end of the car and gives it a tendency to move outward by gravity, owing to the inclined position of the supporting-arms. When the two cars are brought together, these hoods abut against each other face to face, so that a vertically-tight joint is maintained between them. It is to be distinctly understood, however, that the pressure between them is only sufficient to maintain a close union, the frictional contact being so slight that it has no material effect on the lateral motion of the cars.

Owing to a difference in the height of the cars, or other causes, it may sometimes happen that there will be a tendency of one hood to unduly compress the other, one becoming fully extended while the other is unduly com-

pressed. In order to prevent the unsightly appearance which would result from this action, I may provide behind each sustaining-arm <sup>2</sup> a spring <sup>3</sup>, which stands normally out of contact with the arm. When either hood is unduly compressed, its sustaining-arms will encounter the springs and have their backward motion arrested, thus preventing further compression of the hood. At such time, however, the arms of the opposing hood will be out of contact with the other springs, so that the springs do not act in any manner whatever to maintain a pressure between the faces of the hoods.

It is to be observed that the construction of the doors between the cars is such that the stiles are not only permitted an independent vertical motion, but also permitted to approach each other as the cars advance and recede and to swing or twist out of line vertically when subjected to torsional strains by the lateral tipping motion of the cars.

Having thus described my invention, what I claim is—

1. In combination with a car having an end vestibule, two end panels or wings extending inward on opposite sides of the central passage, one of said panels hinged to swing lengthwise of the car, and a vertical door jointed to the inner edge of one of said panels and provided at its opposite edge with means for attachment to an adjacent car, whereby said car is adapted for connection to another of like construction to produce between them a passage closed at the sides.

2. A railway-car provided with the end vestibule, a fixed panel D, a horizontally-swinging panel D', and a horizontally-swinging door E, provided with means for attachment to an adjacent car, and adapted to swing both inward and outward, as described.

3. A railway-car having the end panel, a fixed panel D, a horizontally-swinging door connected to the inner edge of said panel, and a horizontally-swinging panel D' at the opposite side.

4. In combination with two railway-cars having vestibules on their adjacent ends, an intermediate passage-way, the sides of which are formed by vertical horizontally-swinging doors, each door fixed to one car but connected to the other to move lengthwise thereof, whereby the cars are permitted to approach and recede.

5. The combination of two railway-cars having vestibules on their adjacent ends with foot-plates between the cars, vertical doors

forming the sides of a passage between the cars and each connected permanently to one car and detachably to the other, and a suitable hood or canopy over said passage.

6. In combination with two cars having vestibules at their adjacent ends and a passage-way between said vestibules, the two flexible gravitating hoods or canopies attached to the respective cars independently of the side walls of the passages and sustained by inclined pivoted arms.

7. In combination with a vestibule-car, a flexible hood attached to its end and provided with a face-plate weighted at the lower end, and two inclined pivoted arms forming the sole connections between the face-plate and the car.

8. In combination with two vestibule-cars, intermediate doors forming the sides of a passage between them, each of said doors consisting of stiles connected to move vertically in relation to each other and covered with canvas or equivalent pliable material.

9. The door for a vestibule-car, consisting of the stiles, the connecting-springs, and a pliable covering connecting said stiles.

10. In combination with two cars, two intermediate doors forming the side of a passage between them, each door constructed to permit independent vertical motion of its stiles and attached to one of the cars to move in the direction of its length, whereby the cars are permitted to approach separate and also move vertically in relation to each other without destroying the connection.

11. In combination with two cars and an intermediate hood or canopy, two doors forming the side walls of a passage between the cars, each door connected to the respective cars by vertical pivots, so that it may swing horizontally to accommodate itself to the lateral motion of the cars.

12. In a vestibule-extension for a railway-car, a door constructed for edgewise compression.

13. A door for use in vestibule-cars, having its two stiles connected by intermediate springs and a flexible sheet or fabric, whereby the edges of the door are permitted to yield in all directions in relation to each other.

In testimony whereof I hereunto set my hand, this 1st day of November, 1889, in the presence of two attesting witnesses.

JACOB N. BARR.

Witnesses:

F. STANLY ELMORE,  
W. R. KENNEDY.