(No Model.)

3 Sheets—Sheet 1.

W. E. ELLIOTT.

RAILROAD CAR.

No. 443,075. Patented Dec. 16, 1890.

Fig. 1.

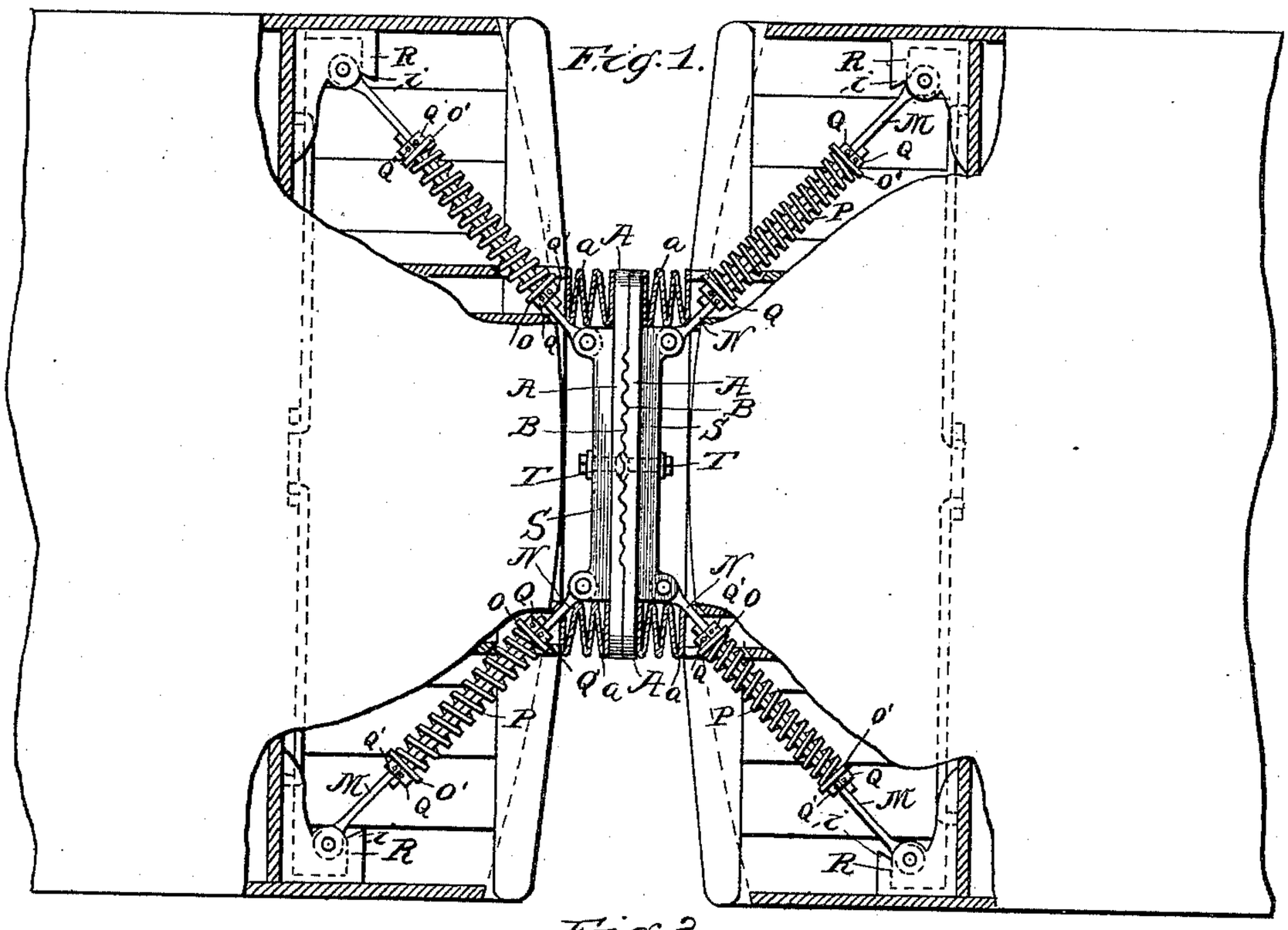
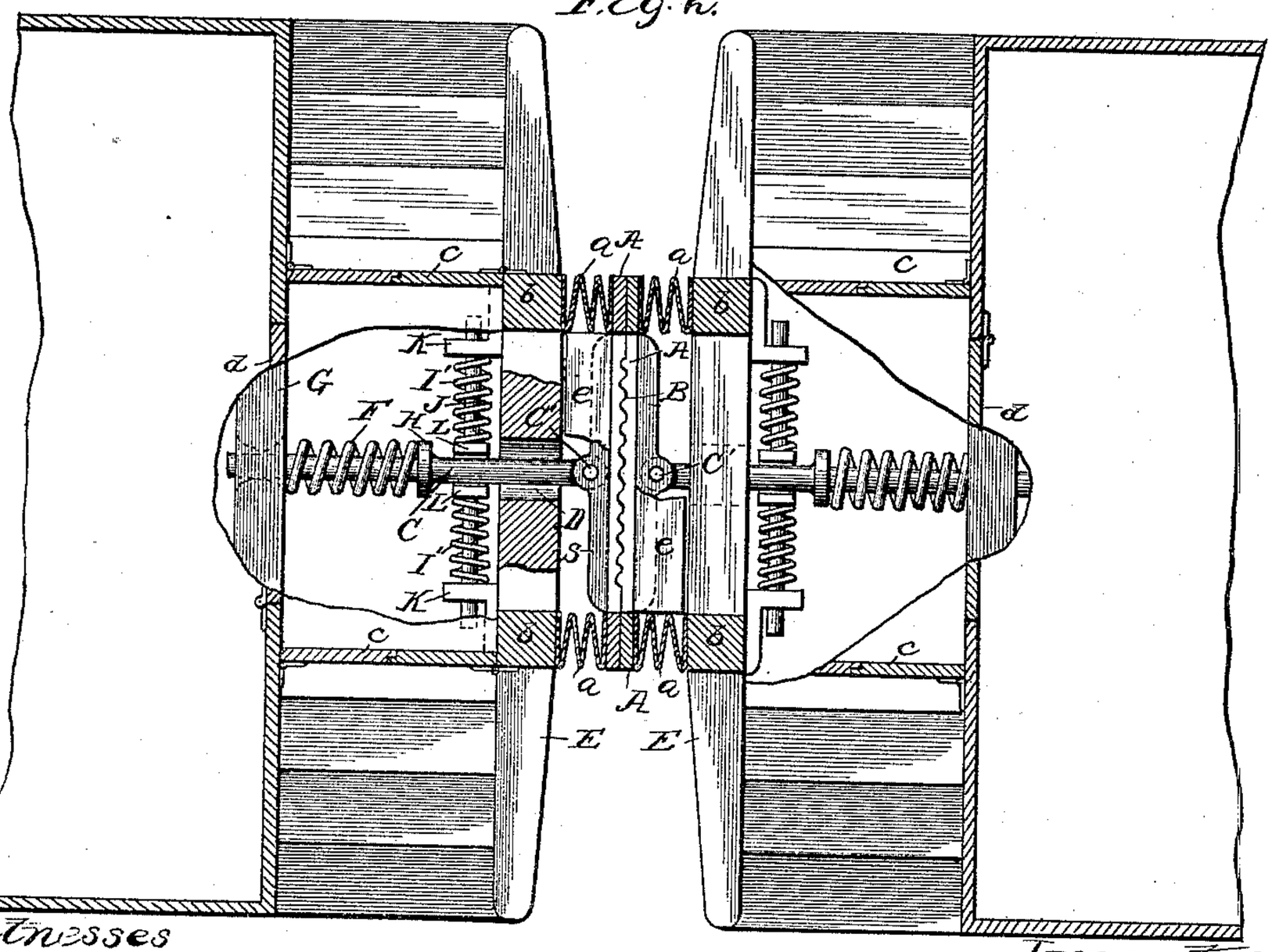


Fig. 2.



Witnesses
Wm. Rheem.
Neill R. Brownell.

Inventor.
William E. Elliott
By Jno. G. Elliott
Atty.

(No Model.)

3 Sheets—Sheet 2.

W. E. ELLIOTT.

RAILROAD CAR.

No. 443,075. Patented Dec. 16, 1890.

Fig. 3.

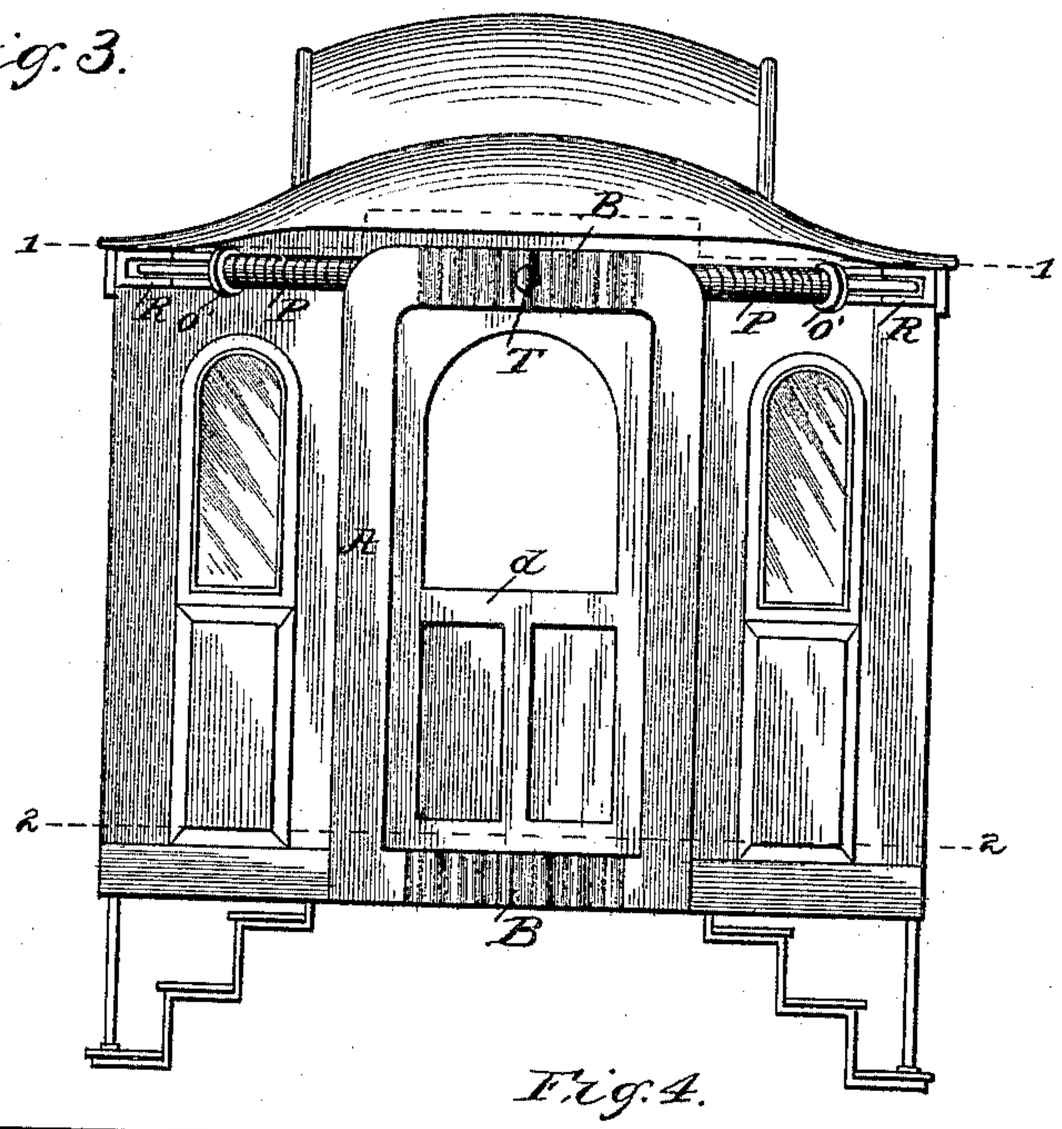


Fig. 4.

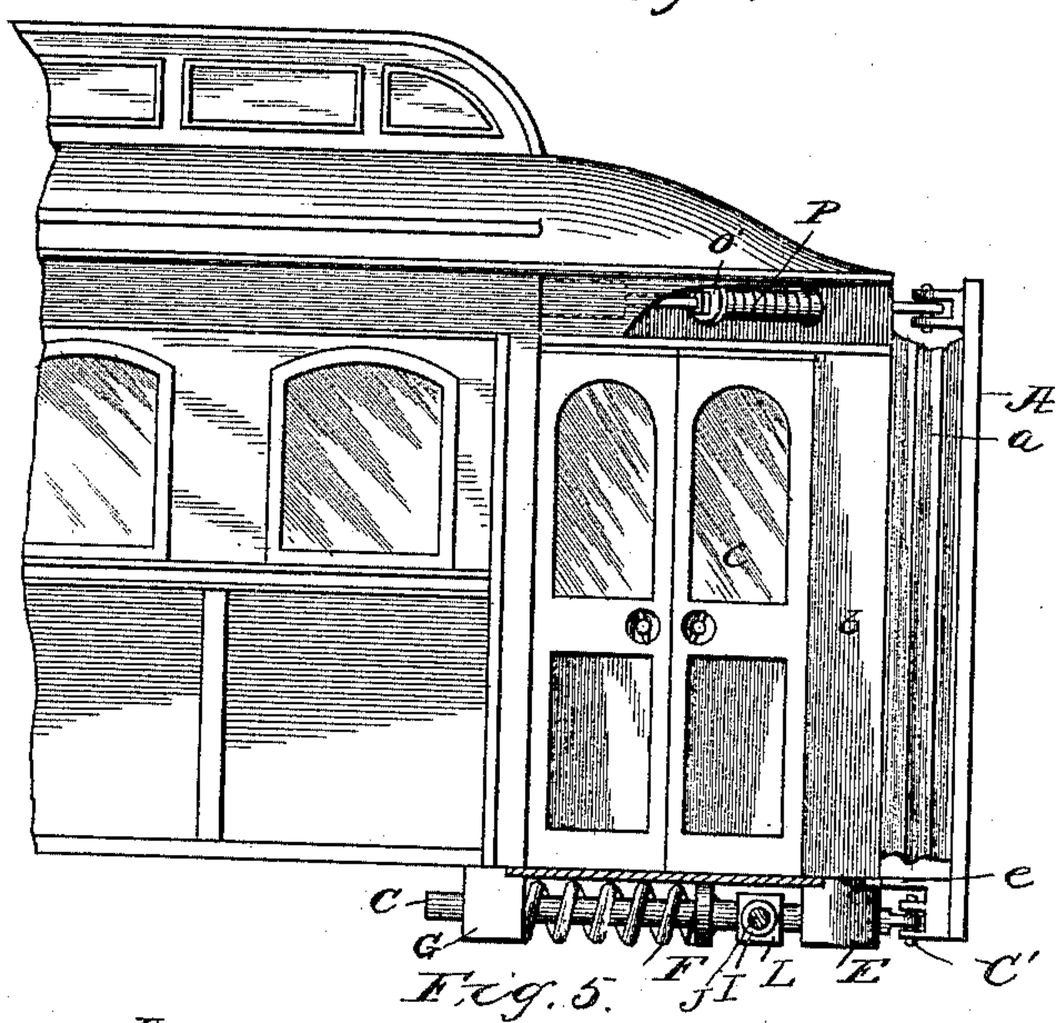
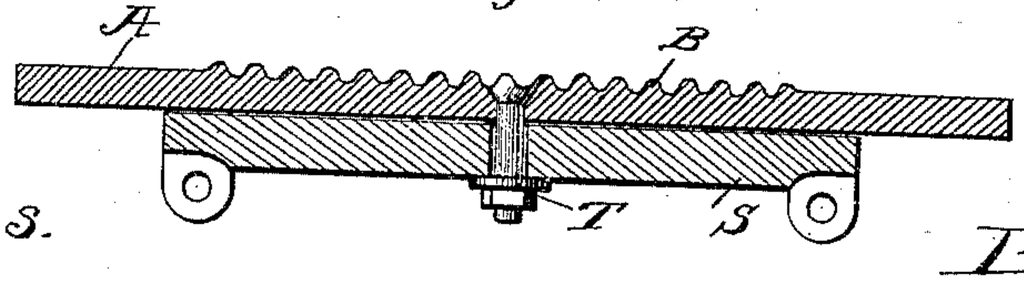


Fig. 5.



Witnesses.
Wm. Rheem.
Will R. Cuchindro

Inventor.
William E. Elliott
By Jno. G. Elliott
Atty

(No Model.)

3 Sheets—Sheet 3.

W. E. ELLIOTT.

RAILROAD CAR.

No. 443,075. Patented Dec. 16, 1890.

Fig. 7.

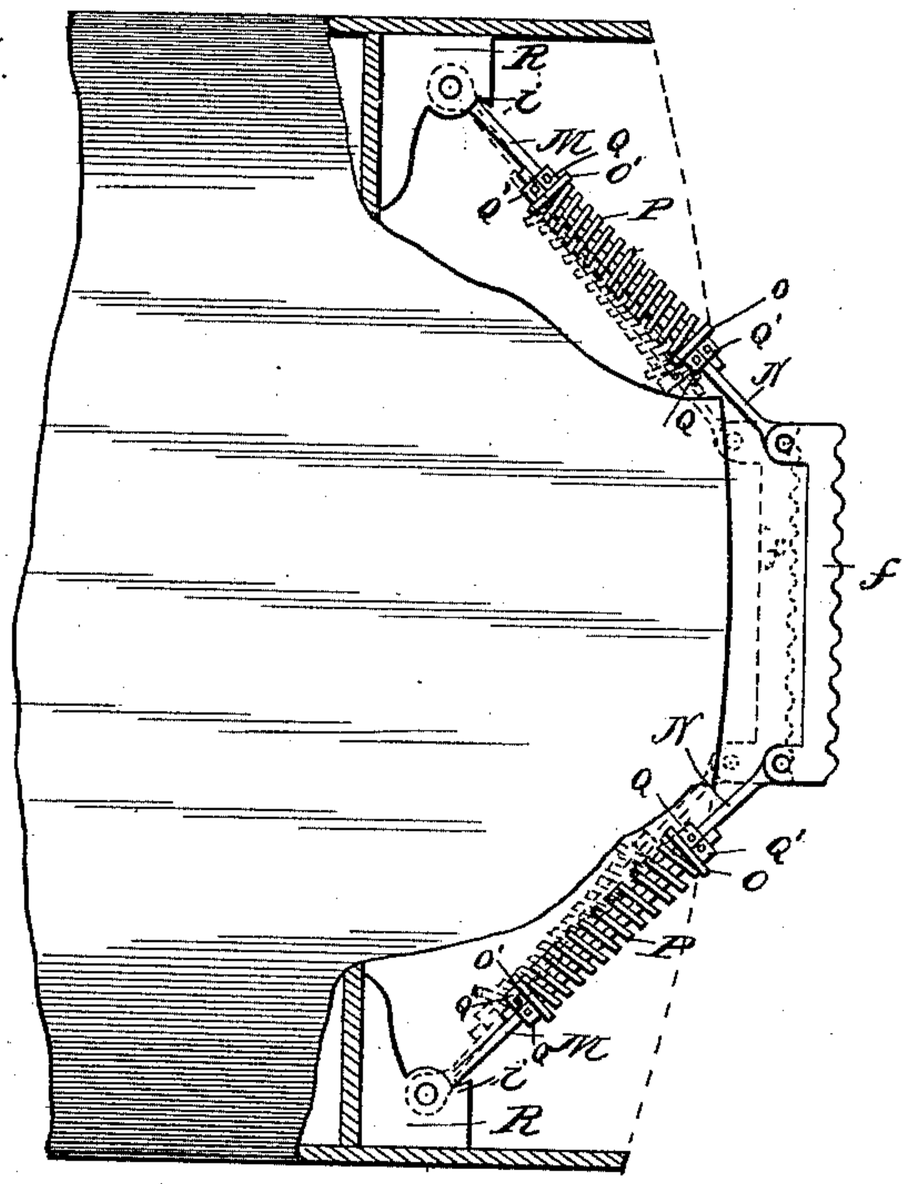


Fig. 6.

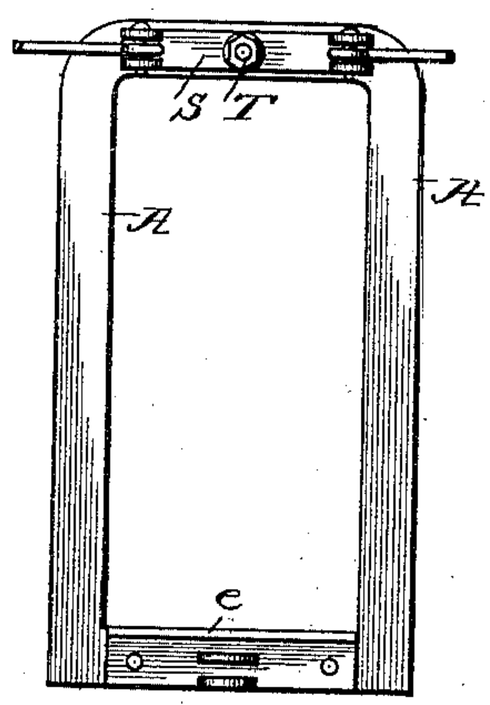
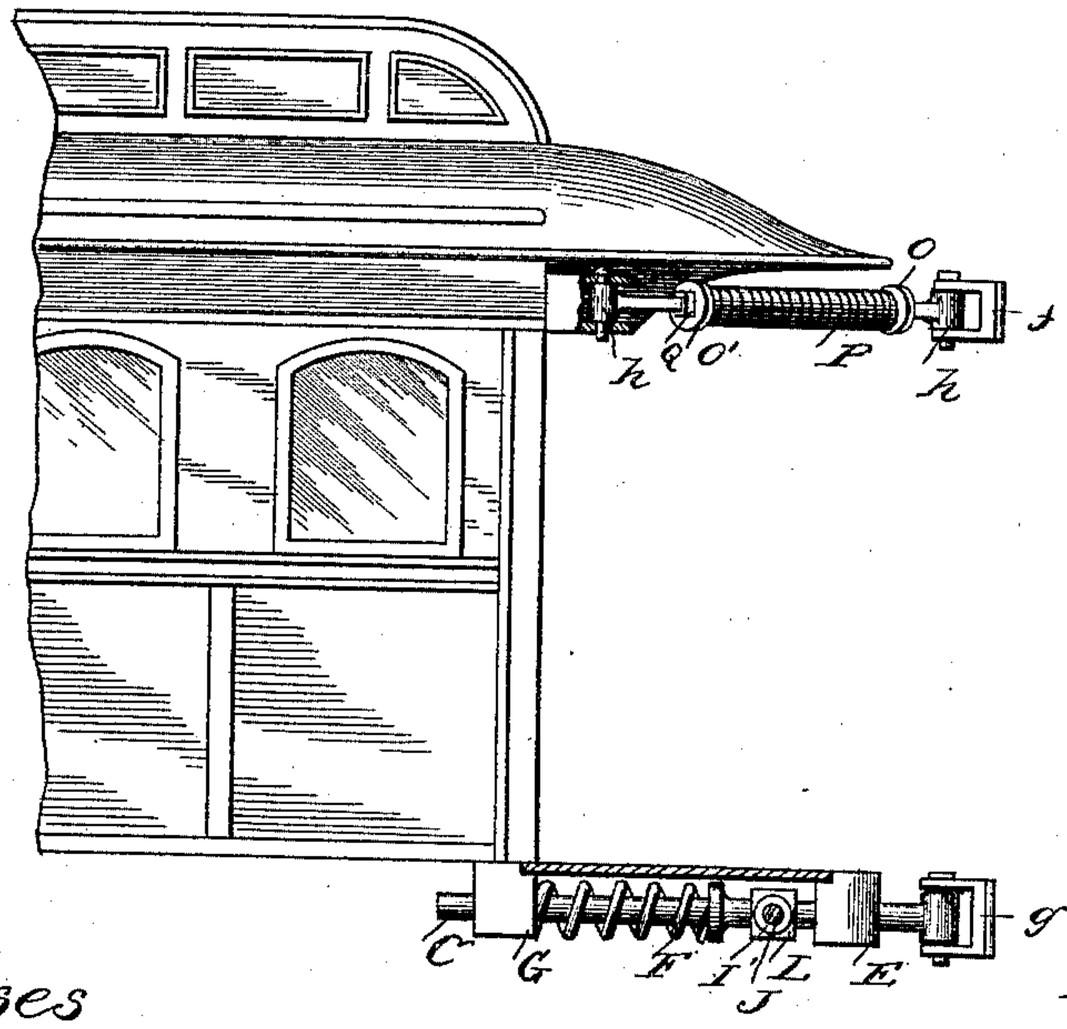


Fig. 8.



Witnesses
Wm. Rheem.
Hill & Donohmedro.

Inventor.
William E. Elliott
By Jno. G. Elliott
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM E. ELLIOTT, OF CHICAGO, ILLINOIS.

RAILROAD-CAR.

SPECIFICATION forming part of Letters Patent No. 443,075, dated December 16, 1890.

Application filed June 16, 1888. Serial No. 277,368. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. ELLIOTT, a citizen of the United States, residing in the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railroad-Cars, of which the following is a specification.

This invention relates to improvements in devices designed to lessen the oscillation of railroad-cars, in which heretofore the cars have been connected by smooth-faced plates or buffers projecting from adjacent cars, movable upon each other, and held in frictional contact by springs sleeved on guide-rods and interposed between said plates or buffers and the superstructure of the cars, the frictional contact of which plates or buffers is solely depended upon to lessen the independent oscillation of the cars, being in no wise assisted in performing their function by any direct action of the springs other than the force exerted thereby, which tends to hold the plates or buffers in frictional contact.

The prime object of this invention is to lessen the oscillation of the cars by having plates projecting from adjacent cars adapted to automatically interlock with and disengage from each other, and so supported on the cars that they may yield both laterally and longitudinally relative to the car-body against an opposing spring force, whereby said plates may subserve the double purpose of buffers and of returning-springs for restoring the cars to an upright position immediately the impelling force is spent.

Another object is to have such interlocking plates so supported either at the platform of the car alone or at some point above the platform, and, if desired, at or near the top of the car-body, or else both at the platform and at a point or points above the platform, which latter arrangement is preferred, because of the greater efficiency of such a combination of devices for accomplishing the desired object.

A further object is to combine with these laterally and longitudinally yielding plates projecting from the ends of adjacent cars an extensible hood connecting said plates with their respective car-bodies, whereby the walls of a vestibule thus formed will be continuous and the opposing ends of said plates held at all times in the same relative position to each other, thus relieving the passengers from the danger of crushing their fingers or being otherwise injured in passing from one car to another by the hand being caught between the edges of sliding plates.

Another object is to have frame-plates supported from the superstructure of the car in such manner that the upper end thereof is free to have a greater movement than the lower end without torsional strain on the connections of said plates with the car-body.

I attain these objects by the devices illustrated in the accompanying drawings, in which—

Figure 1 represents a plan view of the ends of adjacent cars having devices applied thereto embodying my invention, showing the roofs of the cars partly broken away about the line 1 1 of Fig. 3; Fig. 2, a horizontal section thereof, taken just above the platform of the car about the line 2 2 of Fig. 3, with a portion of the platform broken away to more clearly show the manner of supporting the frame-plates at the bottom; Fig. 3, an end view of one of the cars; Fig. 4, a side elevation thereof; Fig. 5, a detail horizontal section through the upper end of one of the frame-plates, showing the manner of pivotally supporting the same; Fig. 6, a rear elevation of one of the frame-plates; Fig. 7, a plan view of one end of an ordinary passenger-coach, showing buffer-plates attached thereto embodying my invention without the employment of vestibule attachments; and Fig. 8, a side elevation thereof.

Similar letters of reference indicate the same parts in the several figures of the drawings.

In the specification and claims I shall make use of the words "superstructure of the car" as synonymous with "car-body," meaning by both these expressions to include all of the car-frame above the trucks as being the most convenient form of expression.

Referring by letter to the accompanying drawings, A indicates the frame-plates projecting from the ends of the cars, preferably composed of flat metal, and having the general size and contour of the doors in the ends of the car, said frame-plates being about six inches wide all around and having the outer

faces thereof vertically corrugated, grooved, or serrated at the top and bottom thereof, as shown at B, so that when brought together these corrugations will interlock, and thereby prevent a lateral sliding movement of said plates upon each other. These plates at the bottoms are pivotally attached to and supported upon the end of a buffer or guide bar C, as shown at C′, which works loosely through a horizontal slot D in the end timber E of the platform, this bar being actuated to normally project by means of a coiled spring F sleeved thereon, and confined between the end sill G of the car-body and a flange or collar H upon said bar, such a construction permitting a longitudinal movement of said bar and consequently of the lower end of the frame-plate. This guide-bar and the lower end of the frame-plate are also free to have a lateral movement in either direction relative to the car-body, but in such movements are opposed by springs I I′, sleeved upon a transverse sliding rod J at each side of the center thereof and confined between the lugs or brackets K, attached to the end timber of the platform, which form guides for said rod, and lugs or shoulders L, projecting from the center of said rod, one on each side of the buffer-bar, whereby the movement of the bar is communicated to the rod so as to compress one of the springs I I′, according to the direction in which the bar moves.

The upper ends of the frame-plates are connected with the superstructure of the car and supported in a vertical position by means of spring-rods extending obliquely from the sides of said plates to the ends of the car superstructure, these rods preferably being constructed in substantially the same manner as the spring-rods shown in my application for Letters Patent, Serial No. 275,479, filed May 29, 1888—that is, in two parts M N, with a sliding connection therebetween obtained by sleeving upon the overlapping ends of said sections disks or plates O O′, between which is confined a coiled spring P, also sleeved upon the overlapping ends of said rods, the said plates being actuated to approach each other and compress the spring by means of lugs Q Q′, of which there is a pair on each rod, between which the plates and springs are confined.

One section M of the spring-rod is pivotally attached to a plate R, rigidly secured to the ends of the car, while the other section N at the opposite end of the rod is pivotally attached to a backing-plate S, between which and the frame-plate at the center thereof there is a pivot-connection obtained by a screw-bolt T or any suitable device through both of said plates, which permits the frame-plate to have a movement upon said pivot whenever the car-body oscillates, and thus relieve the spring-rods and their pivots of a torsional strain, which might otherwise prove detrimental to the durability of the device as a whole. To this end the buffer-bar C, which supports the weight of the frame-plate and its connections, is rounded at its bearings in the timbers of the superstructure, so that the frames may vibrate or oscillate and the upper ends thereof have considerably more movement than the lower ends without affecting the connections of the plates either at the top or bottom of the car. Thus when one of the cars lurches to one side the frame-plate thereof will not have a movement corresponding in degree to that of the car-body because of its engagement by the opposing plate on the adjacent car, which tends to hold said plate in its original central upright position, and as a result of this action on each car there will be a compression of the lateral springs at one side and an expansion of the corresponding springs at the opposite side of the center of the car, which not only operates to lessen the degree of oscillation of the car, but also to return the car to an upright position immediately after the impelling force is spent, and this action is the same regardless of the direction in which the lurch is made or the car which makes it.

The frame-plates shown in Figs. 1 to 6, inclusive, are especially designed for use upon the heavier railroad-cars—such as sleeping, dining-room, and drawing-room cars—for the purpose of forming a vestibule constituting a continuous passage between the cars, to which end the frame-plates at the sides and top are connected by an extensible canopy or covering *a* with vertical posts *b* and the roof of the car or a suitable cross-timber, to which posts are hinged the folding doors *c* for inclosing the sides of the platform, which are supplied in addition to the usual end door *d* of the car, the detailed construction of all of which is now so well known as not to require a more particular description or illustration than herein given, except the statement that the ordinary buffer-plates located above the couplings are dispensed with and substituted by the frame-plates, which are pivotally attached to the projecting end of the usual buffer-bar, and that the space between the said plate and the end timber of the platform is covered by a filling-plate *e*, attached to and moving with the frame-plate, thus constituting that portion of the flooring of the vestibule between the platforms of the adjacent cars.

Frame-plates provided with interlocking faces, as hereinafter described, are of especial utility and advantage when employed in connection with a vestibule arrangement because of the fixed relation of the opposing plates relative to each other, thus forming continuous walls for the vestibule and relieving the passengers of all danger of all injury to their hands or fingers by being caught between the frame-plates, which has frequently been the case with frame-plates as heretofore constructed, wherein they were free to slide upon each other and only held in frictional contact by springs interposed between them and the superstructure of the car; but so far

as relates to these interlocking plates for preventing the oscillation of the car-body it is not necessary that the frame should be continuous, so as to form a doorway, as is shown in the first six figures of the drawings, such a plate being preferable only when the devices are used in connection with cars upon which a vestibule is desired, for the same result would be accomplished whether the interlocking plates are made in sections or employed only at the top and bottom of the car, as shown in Figs. 7 and 8, being there spring-seated and supported, however, in substantially the same manner as if a continuous frame-plate were employed, the only difference being that the upper plate *f* gains no support from the lower plates *g*, which substitutes the usual platform-buffer, and must therefore depend upon the length of its bearing *h* upon the pivot connecting the spring-rods thereof with the car-body or upon some equivalent device for maintaining the plate in its normal position relative to the car-body, so that it will at all times remain in position to engage the opposing plate upon an adjacent car when the cars are coupled together and without the necessity for manipulating either one of them. Such separated plates are especially designed for use upon ordinary passenger-cars, between which, generally, no vestibule is employed, and it would be no departure from my invention to have more than one pair of these plates upon each car, if it is found desirable to do so. So, also, may these frame-plates, if desired, be extended or enlarged, so as to have substantially the same shape and size as the entire end of the car-body, with the vestibule-doors in a plane with the sides of the cars, and the extensible hood connecting the plates with the car-body at the side edges thereof, so that the vestibule as a whole presents the appearance of a continuation of the car-body, for by such a connection wind-pressure upon the ends of the cars may be avoided; but as these modifications are so obvious it is not deemed necessary to herein illustrate or describe them more in detail. In all of these devices, the preferred construction as well as the modified, the interlocking plates, whether frame-plates or otherwise, project farther from the ends of the cars when the cars are uncoupled than they do when the cars are coupled, as shown in Fig. 7 by the full lines, which show the position of the plates and supporting-springs when the cars are uncoupled, while the dotted lines show their coupled position. The outward movement of said plates is limited at the bottom by the flange H on the guide or buffer bar, and at the top by the shoulders *i* upon the coupling-plates secured to the car-body, to which the spring-rods are pivoted. The said rods, when swung out to the full limit of their outward movement, strike against said shoulders, and thereby prevent a further movement in that direction. As a result of this arrangement, when the cars are coupled the opposing interlocking plates are held in close contact with each other by a strong pressure from all of the springs, (excepting the lateral springs at the platform,) all of which are thus under tension when the cars are coupled, and the said plates are thereby held firmly together against accidental shifting relative to each other. The pivotal connection between the interlocking plates and the guide-bars and spring-rods also permits of a free movement of said plates when the cars are turning a curve, without any tendency whatever to separate the plates on the outer side of the curve, as is the case with such plates when held only in frictional contact and upon rigid guide-rods, as in the prior construction, and hence the necessity for equalizers or any equivalent device for maintaining the plates at all times in contact with each other, whether the cars are upon a straight or curved track-section, are dispensed with and the devices correspondingly simplified.

In conclusion, it may be stated that it is immaterial whether the plates are composed of corrugated metal or have the teeth formed thereon, or whether the teeth are formed on a separate plate and attached to the frame or other plates, so long as the said plates are provided with interlocking faces that will prevent their movement upon each other; and, further, that the particular construction of the spring-supports of the plates, either at the top or bottom, is also immaterial, for the springs at the bottom or platform of the car might be duplicated at the top and thus dispense with the oblique spring-seated bars at that point, or vice versa, and, in fact, so far as the interlocking plates operate to lessen the oscillation of the car the springs may be dispensed with altogether, for my invention broadly consists in having opposing interlocking plates projecting from adjacent cars, and, in a more limited sense, to having these plates spring-seated in such manner that they may simultaneously yield, either laterally or longitudinally, relative to the car-body.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of railroad-cars with buffers independent of the draw-bar adapted to automatically lock with and unlock from each other, provided with springs for moving them longitudinally to maintain their engagement and bodily movable laterally in both directions against an opposing spring force, substantially as described.

2. The combination of railroad-cars with buffers arranged at or near the tops of the cars adapted to automatically lock with and unlock from each other, provided with springs for moving them longitudinally to maintain their engagement and bodily movable laterally in both directions against an opposing spring force, substantially as described.

3. The combination, with adjacent cars, of interlocking plates projecting therefrom, said

plates being vertically, but not laterally, movable upon each other and adapted to automatically interlock with and disengage from each other, and springs interposed between the said plates and the superstructure of the car, whereby said plates may together but not separately yield laterally relative to the car-body, substantially as described.

4. The combination, with adjacent cars, of interlocking plates projecting therefrom, spring-seated bars for supporting said plates, and opposing lateral springs interposed between said bars and the superstructure of the car for yieldingly maintaining said bar against lateral movement, substantially as described.

5. The combination, with adjacent cars, of interlocking plates projecting therefrom, spring-seated guide-bars supporting said plates, transverse sliding rods bearing in the superstructure of the cars, provided with shoulders thereon at each side of said guide-rods, and opposing springs interposed between said shoulders and the superstructure of the car, substantially as described.

6. The combination, with adjacent cars, of interlocking plates projecting therefrom and a pivot supporting said plates, substantially as described.

7. The combination, with adjacent cars, of interlocking plates projecting therefrom, spring-seated guide-rods supporting said plates, and a pivot connecting said bars and plates, substantially as described.

8. The combination, with adjacent cars, of interlocking plates projecting therefrom, guide-bars supporting said plates, a pivot connecting said bars and plates, and opposing transverse springs for yieldingly maintaining said bars against a lateral movement, substantially as described.

9. The combination, with adjacent cars, of interlocking plates projecting therefrom, guide-rods for supporting said plates, a pivot connecting said bars and plates, and opposing transverse springs interposed between said bars and the superstructure of the cars, substantially as described.

10. The combination, with adjacent cars, of interlocking plates projecting therefrom and springs interposed between said plates and the superstructure of the cars, extending obliquely to the length of said cars, substantially as described.

11. The combination, with adjacent cars, of interlocking plates projecting therefrom and spring-seated rods supporting and connecting said plates with the superstructure of the cars, extending obliquely to the length of said cars, substantially as described.

12. The combination, with adjacent cars, of interlocking plates projecting therefrom and spring-seated rods pivotally secured at their ends, respectively, to said plate and cars and extending obliquely to the length of said cars, substantially as described.

13. The combination, with adjacent cars, of interlocking plates projecting therefrom, pairs of rods connecting said plates with the superstructure of the cars, a sliding connection between the rods for each pair, and springs sleeved on said rods, substantially as described.

14. The combination, with adjacent cars, of interlocking plates projecting therefrom, pairs of rods connecting said plates and the superstructure of the car, a sliding connection between the rods of each pair of lugs on said rods, and springs sleeved on said rods and confined between said lugs, substantially as described.

15. The combination, with adjacent cars, of interlocking plates projecting therefrom, pairs of rods connecting said plates and the superstructure of the cars, lugs on said rods, collars sleeved on said rods between the lugs, and a spring also sleeved on said rods and confined between said collars, substantially as described.

16. The combination, with adjacent cars, of interlocking plates projecting therefrom, spring-seated rods connecting said plates with the superstructure of the cars, extending obliquely to the length of the cars, and a pivot-connection between said plates and rods, substantially as described.

17. The combination, with adjacent cars, of interlocking plates projecting therefrom, backing-plates for said interlocking plates, a pivot-connection between said interlocking and backing plates, and spring-seated rods connecting said backing-plates with the superstructure of the cars, extending obliquely to the length of said cars, substantially as described.

18. The combination, with adjacent cars, of interlocking frame-plates projecting therefrom, spring-seated guide-rods supporting said plates, a pivot connecting said bars and plates, and extensible hoods connecting said plates and the superstructure of the cars, substantially as described.

19. The combination, with adjacent cars, of interlocking frame-plates projecting therefrom, spring-seated guide-bars supporting said plates, opposing transverse springs for yieldingly maintaining said bars against a lateral movement, and extensible hoods connecting said plates and the superstructure of the cars, substantially as described.

20. The combination, with adjacent cars, of interlocking frame-plates projecting therefrom, spring-seated bars supporting said plates, a pivot connecting said bars and plates, opposing transverse springs interposed between said bars and the superstructure of the cars, and extensible hoods connecting said plates, substantially as described.

21. The combination, with adjacent cars, of interlocking frame-plates projecting therefrom, spring-seated bars supporting the lower ends of said plates from the superstructure of the cars, and spring-seated rods connecting the upper ends of said plates with the su-

perstructure of the cars, extending obliquely to the length of said cars, substantially as described.

22. The combination, with adjacent cars, of interlocking frame-plates projecting therefrom, spring-seated guide-bars supporting the lower ends of said plates from the superstructure of the cars, a pivot-connection between said plates and bars, and spring-seated rods connecting the upper ends of said plates with the superstructure of the cars, extending obliquely to the length of said cars, substantially as described.

23. The combination, with adjacent cars, of interlocking frame-plates projecting therefrom, guide-bars supporting the lower ends of said plates from the superstructure of the cars, transverse springs for yieldingly maintaining the lower ends of said plates against lateral movement, and spring-seated rods connecting the upper ends of said plates with the superstructure of the cars, extending obliquely to the length of the cars, substantially as described.

24. The combination, with adjacent cars, of interlocking frame-plates projecting therefrom, spring-seated guide-bars supporting the lower ends of said plates from the superstructure of the cars, a pivot-connection between said bars and plates, opposing transverse springs interposed between said bars and the superstructure of the cars, and spring-seated rods connecting the upper ends of said plates with adjacent cars, substantially as described.

WILLIAM E. ELLIOTT.

Witnesses:
WILL R. OMOHUNDRO,
ALBERT M. BENNETT.