

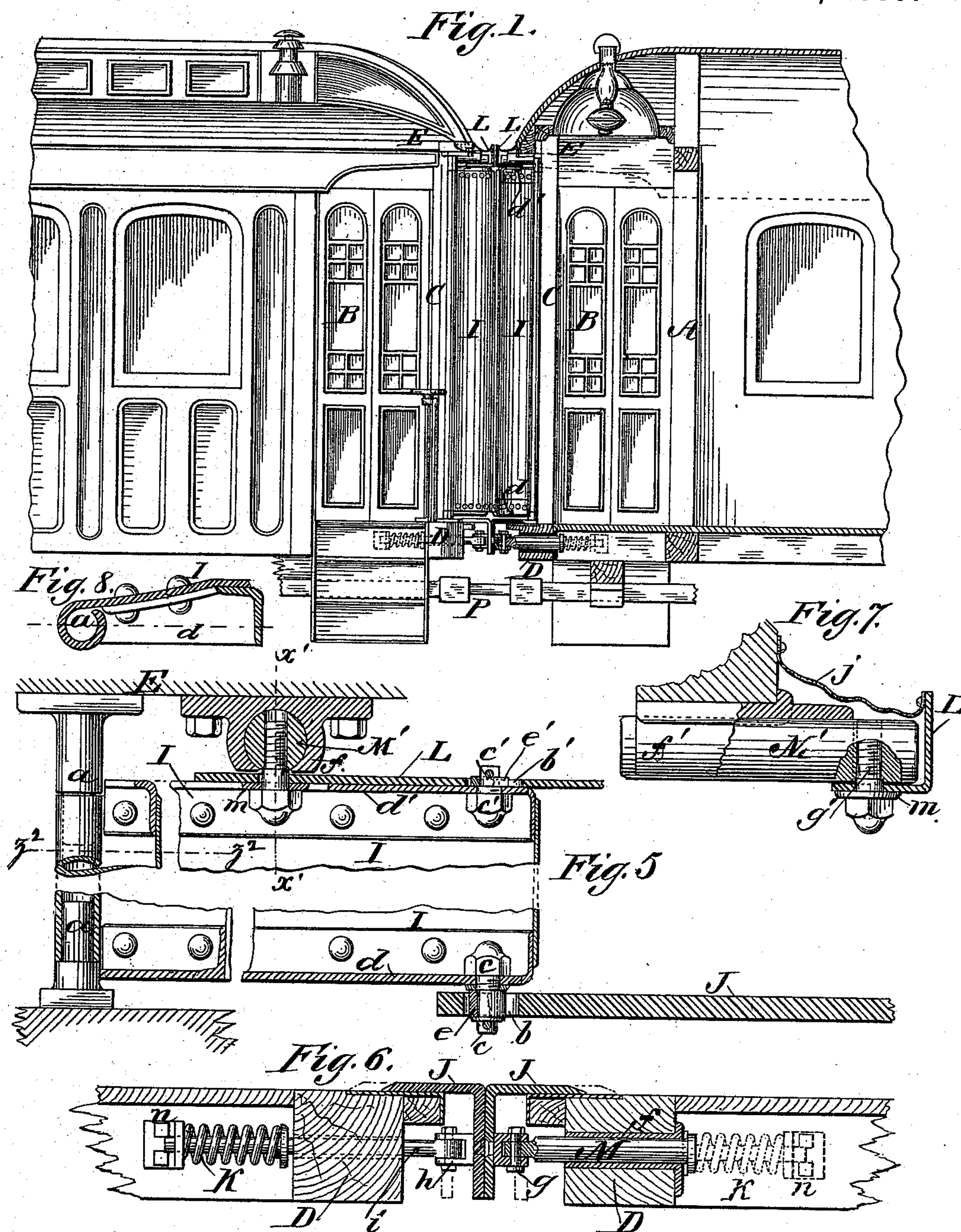
(No Model.)

2 Sheets—Sheet 1.

R. SOLANO.  
VESTIBULE RAILWAY CAR.

No. 413,874.

Patented Oct. 29, 1889.



**WITNESSES:**

H. F. Parker  
Chas. Hariman

INVENTOR

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Renaudo Salame  
BY  
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(No Model.)

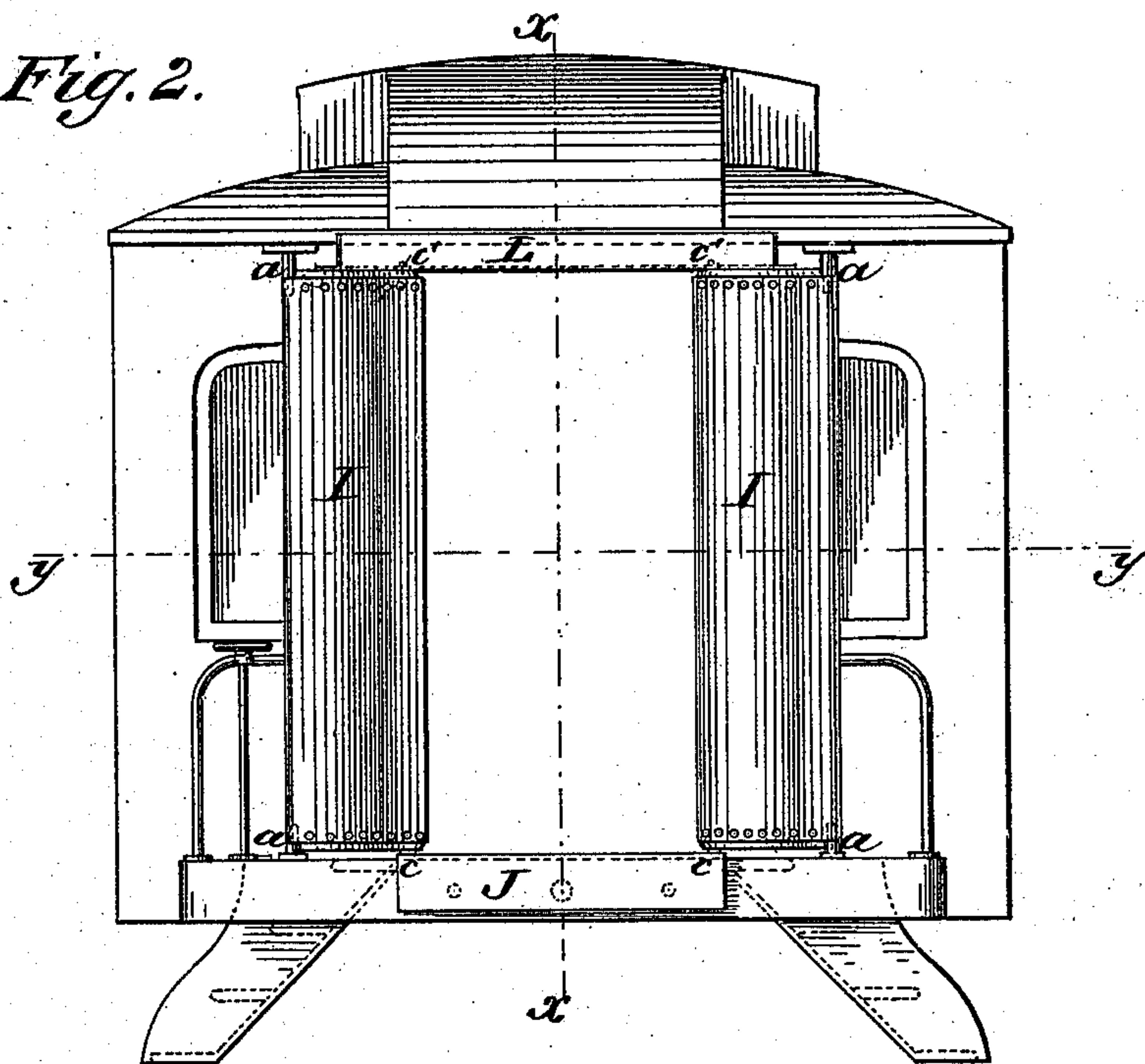
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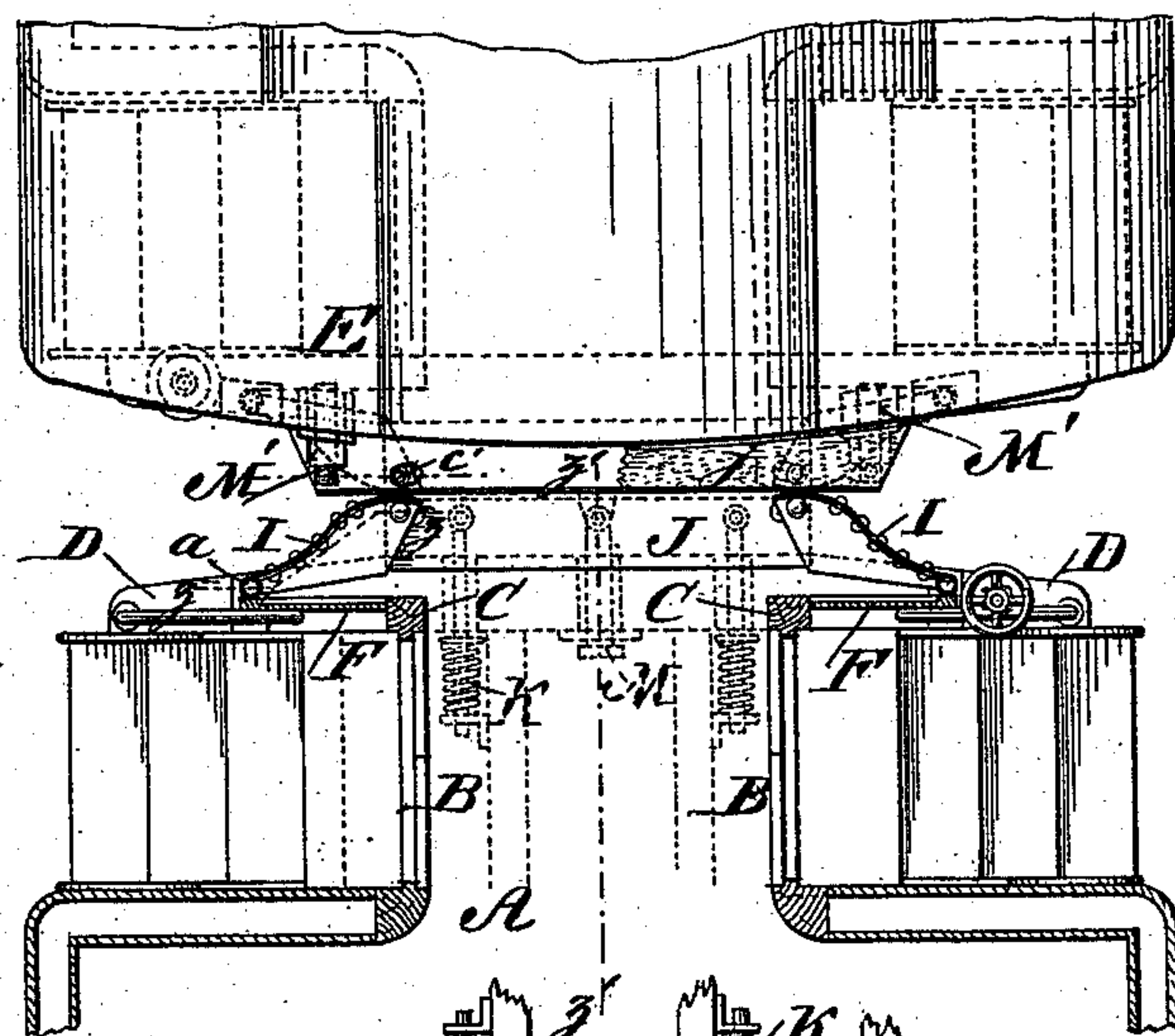
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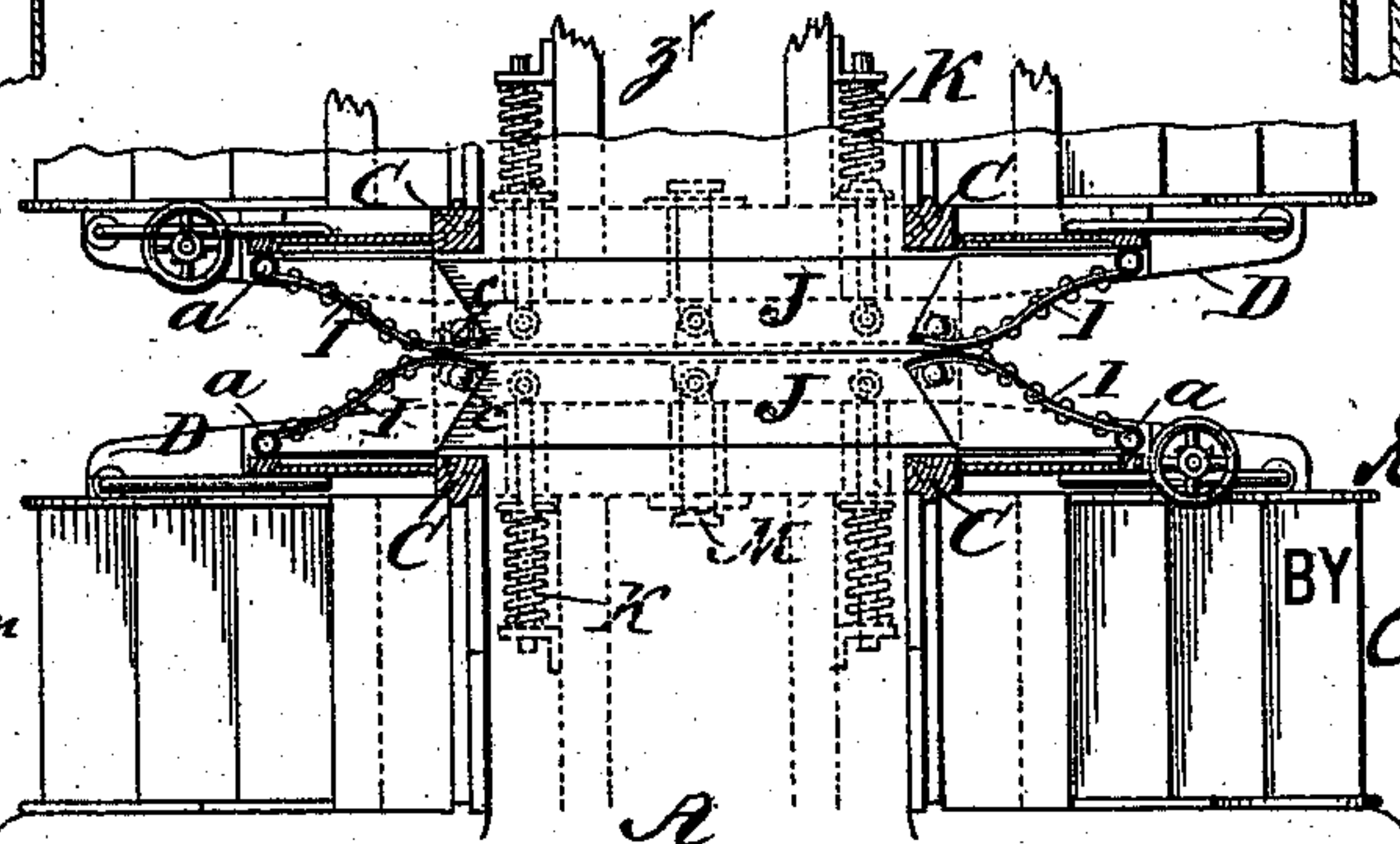
*Fig. 2.*



*Fig. 3*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

RENALDO SOLANO, OF BROOKLYN, NEW YORK, ASSIGNOR OF TWO-THIRDS  
TO JOHN W. HOWARD AND DAVID R. MORSE, BOTH OF SAME PLACE.

## VESTIBULE RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 413,874, dated October 29, 1889.

Application filed July 13, 1889. Serial No. 317,378. (No model.)

*To all whom it may concern:*

Be it known that I, RENALDO SOLANO, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Vestibuled Railway-Cars, of which the following is a specification.

My invention relates to vestibuled railway-trains in which a continuous inclosed passage-way is provided between the cars adapted for the exclusion of dust, cinders, &c., and having a flexible connection above the couplings, whereby the oscillating or the angular movements of the cars relatively to one another while passing around curves are yielded to.

My invention consists in a novel construction of the yielding connection, in which I employ, essentially, the following elements: threshold or buffer plates abutting together to form a continuous platform, hoods or transom-plates abutting together to form connection between the roofs, and then, in conjunction therewith, pairs of vertically-swiveled plates abutting together to form expanding or contracting flanks of the structure.

In order to enable others skilled in the art to which my invention appertains to understand and use the same, I will proceed to fully explain the further specific details of construction necessary to carry the invention into practice, making reference to the accompanying drawings, in which similar letters refer to corresponding parts throughout, and in which—

Figure 1 is an elevation of adjacent cars, one appearing in side elevation, the other in sectional elevation, ( $x x$ , Fig. 2,) showing my improvements; Fig. 2, an end elevation of one car separated; Fig. 3, a plan view of adjacent cars, one of them being in horizontal section on the line  $y y$ , Fig. 2; and Fig. 4, a similar view taken wholly in the said horizontal plane of section. Fig. 5 is an enlarged detail view of one of the flanks, looking toward the inside thereof, being taken on the line  $z z$ , Fig. 3; Fig. 6, an enlarged sectional view on the line  $z' z'$ , Fig. 3, showing the arrangement of the threshold or buffer plates; Fig. 7, an enlarged detail view showing in

section on the line  $x' x'$ , Fig. 5, the construction of the hood or transom; and Fig. 8, a detail view on the line  $z^2 z^2$ , Fig. 5.

A, Fig. 3, represents the doorway in the car-body, and B B the vestibule-doors, arranged, according to usual construction, at either side of the passage, the outposts C, extending from the buffer-beam D to the roof E, being stationary.

P represents the couplers, of ordinary construction and location.

F F are offset walls extending from the outposts C outward to fill the space between said posts and the vertical rods  $a$ , upon which the flanks I are vertically pivoted. The flanks I are outwardly convex and are rounded or cylindric at a portion of their outer surfaces, which abut so that such surfaces may act upon one another with a rolling movement when the cars receive the hereinbefore-described movements. The flanks I are retained together in contact by a peculiar means of connection and co-operation with the horizontal buffer-plates having buffer-springs applied to them. The buffer-springs may be applied to both the threshold buffer-plates and the transom or hood plates; but I prefer to apply them at K to the threshold-plates only, the conjunctive operation of the parts, which I will proceed to describe, being such that the approaching or retracting or the swivel movements of the one said set of plates are transmitted to the other thereof through the flanks, which swing in parallel relation. The flanks have horizontal base and top plates  $d d'$ , which lie adjacent the horizontal surfaces or flanges of the threshold buffer-plates J J and the hood-plates L L. These plates  $d d'$  bear studs  $c c'$ , which respectively engage with slots  $b b'$  in the said threshold and hood plates. The slots  $b b'$  are of sufficient length to allow of the necessary play of the flanks and have a curvature or inclination corresponding with the natural path of the studs  $c c'$  during the rolling movement of the convex surfaces, before referred to, of the plates I I upon one another. The studs  $c c'$  are preferably provided with anti-friction rollers  $e e'$ , to contribute to ease of movement. The threshold-plates J J, being re-



tained together by the pressure of the springs K, and the flanks I I, similarly connected to the hoods L L as are the plates J J, thereby cause the structure to act in unity, the  
5 springs K pressing all parts thereof together simultaneously.

The plates J J and L L are capable of both longitudinal and swivel movement upon a central vertical axis relative to the buffer-  
10 beam and the transverse roof-beam, whereby their surfaces may be maintained intact during the alternate approaching or retracting movements of opposite sides of the cars. For this purpose I provide a central bolt M, ca-  
15 pable of sliding freely through the bushing in the buffer-beam D, and to the outer end of which bolt the threshold or buffer plate J is swiveled at *g*, as clearly shown in Fig. 6. The buffer-springs K at either side beneath  
20 the platform abut in brackets *n*, affixed to the car, and have their sliding rods *i* provided with swivel-connections *h* to the extremities of the plate J. The central bolt M thereby acts as a guide to relieve the spring-rods *i* of  
25 undue side-thrust. I also provide the hood L with guide-bolts M', which slide longitudinally in bearings *f'*, attached to the roof frame-work, and which, having swivel-studs *g'*, upon which the plate L oscillates, act simi-  
30 larly as do the guide-bolts M, being, however, placed near the extremities of the hood L, as seen in Fig. 3. It will be noted that the perforations in the plate L, through which the studs *g'* extend, are slightly elongated side-  
35 wise to permit the arc movements of the ends of such plate, and also that the head of the stud *g'* and the washer *m* are located apart from and do not have any connection with the flank I other than through the agency of  
40 the stud *c'*. The variable intervening space between the plate L and the end of the car is inclosed with any suitable flexible covering-shield *j*, extending from side to side of the structure, as seen in Figs. 3 and 7.

45 The webs or terminal plates *d d'* of the flanks I I serve both to stiffen them and also as means of forming dust-proof joints, lying as closely upon the horizontal surfaces of the plates J L as may be found expedient without undue friction.

Having thus fully described my invention, I claim—

1. The combination, in a railway-car, of a threshold buffer-plate oscillating upon a ver-  
55 tical axis movable longitudinally to the car, a transom-plate similarly movable, and vertically-pivoted connecting-flanks, to the movable extremities of which the extremities of the said plates are swiveled in common ver-  
60 tical axes to receive corresponding advancing, retracting or oscillating movements simultaneously.

2. The combination, with the vestibuled end of a railway-car, of a threshold buffer-

plate oscillating upon a vertical axis mova- 65 ble longitudinally to the car, a transom-plate similarly movable, and vertically-pivoted connecting-flanks inclosing the sides of the spaces that intervene adjacent cars, to the movable extremities of which flanks the ex- 70 tremities of the said plates are swiveled in common vertical axes and present abutting surfaces in a common plane with the abutting surfaces of the said flanks for the purpose of forming contact with a correspond- 75 ing structure of an adjacent car.

3. The combination, in a railway-car, of a threshold buffer-plate, a transom-plate, guide- bolts sliding in bearings longitudinally to the car, to which guides-bolts the said plates are 80 swiveled to oscillate, buffer-springs for advancing the threshold-plates, and vertically-pivoted connecting-flanks, to the movable extremities of which the extremities of said plates are swiveled in common vertical axes, 85 whereby the oscillation of the threshold-plate and the advancement of the same by the buffer-springs is imparted to the transom-plate.

4. The combination, with the adjoining ends of railway-cars, of vestibule-extensions 90 communicating to form a continuous passage, offset walls extending laterally from the outposts of the vestibule, flanks extending the height of the vestibules vertically pivoted at the extremities of said walls and inclining at 95 their movable extremities (in horizontal cross-section) toward the center of the cars and toward a plane of contact with one another, threshold buffer-plates, and transom- plates oscillating upon vertical axes movable 100 longitudinally to the cars to abut at said plane of contact, the movable extremities of the flanks being swiveled to the extremities of said plates, substantially as and for the purposes set forth. 105

5. The combination, in the vestibuled end of a railway-car, of a threshold buffer-plate and transom-plate, both oscillating upon a vertical axis movable longitudinally to the car, vertically-pivoted flanks supplementing 110 the interval of the vestibule and a plane of junction of an adjoining car, said flanks having convex or rolling contact-surfaces co-operative in the manner specified with the flanks of such adjoining car, swivel-studs in the 115 movable extremities of the flanks and slots in the extremities of the said threshold, and transom-plates with which the studs engage, as and for the purposes set forth.

6. The combination, in a railway-car, of a 120 movable threshold buffer-plate, a movable transom-plate, and pivoted connecting-flanks that inclose the sides of the space that intervene adjacent cars.

RENALDO SOLANO.

Witnesses:

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CHAS. HANIMANN.