(No Model.)

R. SOLANO.

RAILWAY CAR.

No. 437,729. Patented Oct. 7, 1890.

Fig. 1.

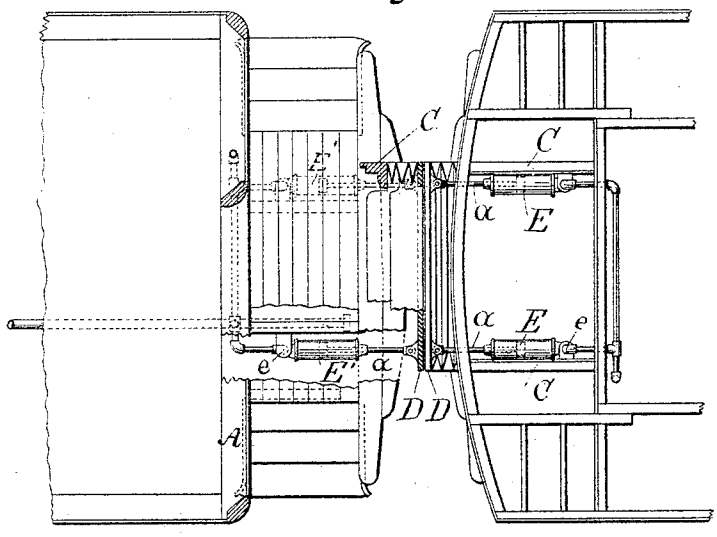
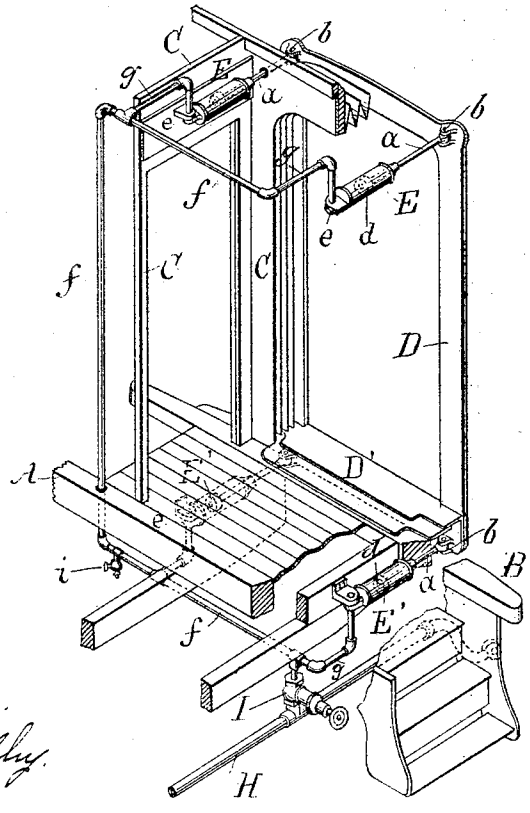


Fig. 2.



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RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 437,729, dated October 7, 1890.

Application filed May 7, 1889. Serial No. 309,940. (No model.)

To all whom it may concern:

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

My invention relates to means for retaining the buffer-plates of adjacent railway-cars together in frictional contact, whereby the tendency of the cars to a jostling or swaying movement relatively to one another is checked, the necessary yielding motions of the plates being especially provided for by means of my said invention.

The invention relates particularly to the buffer plates or frames adapted for use in vestibuled trains, in which a continuous inclosed passage-way is provided between the cars, the said buffer plates or frames extending the height of the car and being adapted to allow of head-room to permit the passage of persons through them.

The invention is, however, applicable to any form whatever of frictional buffer-plates between the abutting ends of railway-cars adapted to give a yielding motion of compression or expansion upon opposite sides of the platforms when the cars are rounding a curve of the road.

Heretofore backing-springs have been employed to compress the adjacent faces of the buffer-plates in frictional contact, and equalizing-levers have been employed to compensate for the required oscillating movement of the plates, thereby balancing the springs on opposite sides of the car. Such devices, however, render the degree of frictional pressure upon the plates variable according as the springs expand or contract, and, moreover, the outward pressure of the springs cannot be conveniently relieved during the act of coupling the cars, but must be overcome by concussion in order to bring the couplers together.

The objects of my invention are, first, to effect a uniform frictional pressure upon the buffer-plates irrespective of the advancing or retracting movements of the same in their bearings; second, to provide a means of perfectly equalizing the pressure upon opposite sides of the frames when the cars are upon a curve, and, third, to provide convenient means of increasing or decreasing the pressure upon the buffer-plates or of relieving such pressure entirely.

My invention consists, first, in retaining the buffer-plates upon one another by means of compressed air, the pressure being admitted to piston-cylinders located opposite the plates or otherwise connected with them; second, in compensating for the tilting of the said plates by free communication of such compressed air within separate cylinders, and, third, in imparting or relieving such pressure from a controllable source of supply—namely, the brake-pipe or other train-pipe to which an air-reservoir or compressor and a relief-valve are connected.

The accompanying drawings illustrate my invention applied to vestibuled cars, of which—

Figure 1 is a plan view, partly in section, of the coupled ends of two cars, the portion of the figure at the right representing the frame of the roof, the sheathing being removed, the portion at the left being taken in sectional planes, respectively, above and beneath the platform of the car. Fig. 2 is a perspective view of the platform and vestibule, partly removed, looking from the body of the car toward the end thereof, showing the buffer-plate, the cylinders, and the air-pipe connections.

A represents the transverse beam terminating the body of the car, and B the buffer-beam of the plaform.

C C are the walls of the vestibule, D the buffer-plates, and F the flexible connection between the said walls and plates.

D′ is the movable still of the frames D.

E E are the piston-cylinders located near the tops of the cars, and E′ E′ those located beneath the platforms, all connecting by means of piston-rods *a* with the two upper and two lower corners of the buffer-plates D D. The ends of the piston-rods are swiveled at *b* to the said plates to allow of the oscillation of the latter, and the backs of the cylinders may also be connected to suitable parts of the car frame-work by swivel-joints, such as those indicated at *e*, and through which

the pipe-connections are made to constantly connect in rear of the pistons *d*. As a more simple form of construction, the cylinders may be rigidly fixed to the frame-work, the flexibility of the piston-rods compensating for the slight arc of movement of their swiveled ends. Moreover, the cylinders E or E′ may be located in any other suitable positions than those shown—as, for instance, vertically or transversely to the car—suitable mechanical connections being made to impart the proper direction of motion to the frames D.

H is the brake-pipe or other air-pipe, having the usual flexible couplings, conducting the compressed air the entire length of the train from a suitable reservoir and compressor, such as that pertaining to the air-brakes.

I represents a pressure-reducing and check valve, of any suitable or well-known construction, having for its function to admit a uniform and comparatively moderate pressure to the cylinders E E′, irrespective of the greater or less fluctuations of pressure in the pipe H while the brakes are being operated; also to compensate leakage and to prevent the return of air to the brake-pipe when the said cylinders are in operation.

The several cylinder-pipes *g g* are connected at one or both ends of the car by a pipe *f*, and the same pressure is thereby exerted in all of the cylinders. The volume of air contained within the cylinders and pipes *f* and *g* is sufficient not to be materially increased or decreased in pressure by the slight simultaneous movement of all the pistons in one direction, such as incident to the jostling or longitudinal movement of the cars relatively to each other. A suitable expansion-chamber or enlargement may, however, be provided in connection with the pipe *f*, if found necessary, in order to effect the required purpose of non-variable pressure, which is an important feature of the invention. The expanding movement of the one side of the buffer-frames and the contracting movement of the opposite side thereof, being substantially equal when the cars pass upon a curve, will not vary the pressure by the stroke of the pistons produced, however considerable the length of such stroke that may occur.

In operation the faces of the buffer-plates stand normally beyond the ends of the cars when the latter are uncoupled, and the plates may be compressed in the act of coupling if the cylinders are kept permanently charged. When springs are employed, should they be adjusted to exert a strong pressure, the concussion required in the act of coupling to force the buffer-plates back and connect the couplers is considerable, limiting, therefore, the strength practicably given to the backing-springs. An obvious advantage of my invention consists in that the buffer-plates may be free from pressure, the air in the cylinders E E′ being relieved, allowing the pistons to retract until subsequent to the act of coupling the cars, whereupon the act of charging the brake-pipe from the engineer's operating-valve will compress all the buffer-plates throughout the train simultaneously with any desired amount of force, such force being limited only by the adjustment of the reducing-valve I.

A suitable escape-cock *i* or other releasing-valve may be provided to the pipe *f*, to be opened when the cars are uncoupled, or the reducing-valve I may be so constructed as to relieve the pipe *f* when pressure is wholly discharged from the train-pipe H.

It is to be noted that my invention is applicable either to the vertically-arranged buffer-plates shown or to equivalent series of buffer-plates variously located upon the superstructure, as well as the buffer-beam of the car, or to buffers independent of the couplers located upon or beneath the platform only. It is also to be noted that the amount of pressure exerted upon the plates may be made variable in due proportion to the load upon the cars and the consequent amount of inertia which is to be resisted in the act of accelerating or decreasing the speed. It is to be observed, moreover, that flexible diaphragms or bellows-shaped expansible chambers are to be considered as the mechanical equivalent of the cylinders claimed herein and as included within the intended scope of the invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a railway-car, with a single buffer-plate lying in a plane transverse to the body of the car, projecting normally beyond the end thereof, piston-cylinders or equivalent operative to advance portions of said buffer-plate at opposite sides of the center of the car, a connecting pipe or pipes between the said opposite cylinders for equalizing pressure, and a supply-pipe connecting the whole with a controllable source of pressure or means of exhaust.

2. The combination, in a railway-car, of a buffer or buffers, a piston cylinder or cylinders, or their equivalent, the air-brake pipe, a connecting-pipe between said brake-pipe and said cylinder or cylinders, and an automatic pressure reducing and regulating valve interposed in said connecting-pipe, whereby uniform pressure is maintained upon the buffer or buffers irrespective of fluctuation of train-pipe pressure.

3. The combination, with the buffer-frame of a vestibule-car, of piston-cylinders and pistons having universal-joint connection with said buffer-frame, and a supply-pipe for admitting pressure to or exhausting said cylinders, whereby the buffer-frames may be held in contact by a regulated or controllable pressure.

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