(No Model.) 3 Sheets—Sheet 1.

B. S. HENNING.

RAILWAY CAR.

No. 446,065. Patented Feb. 10, 1891.

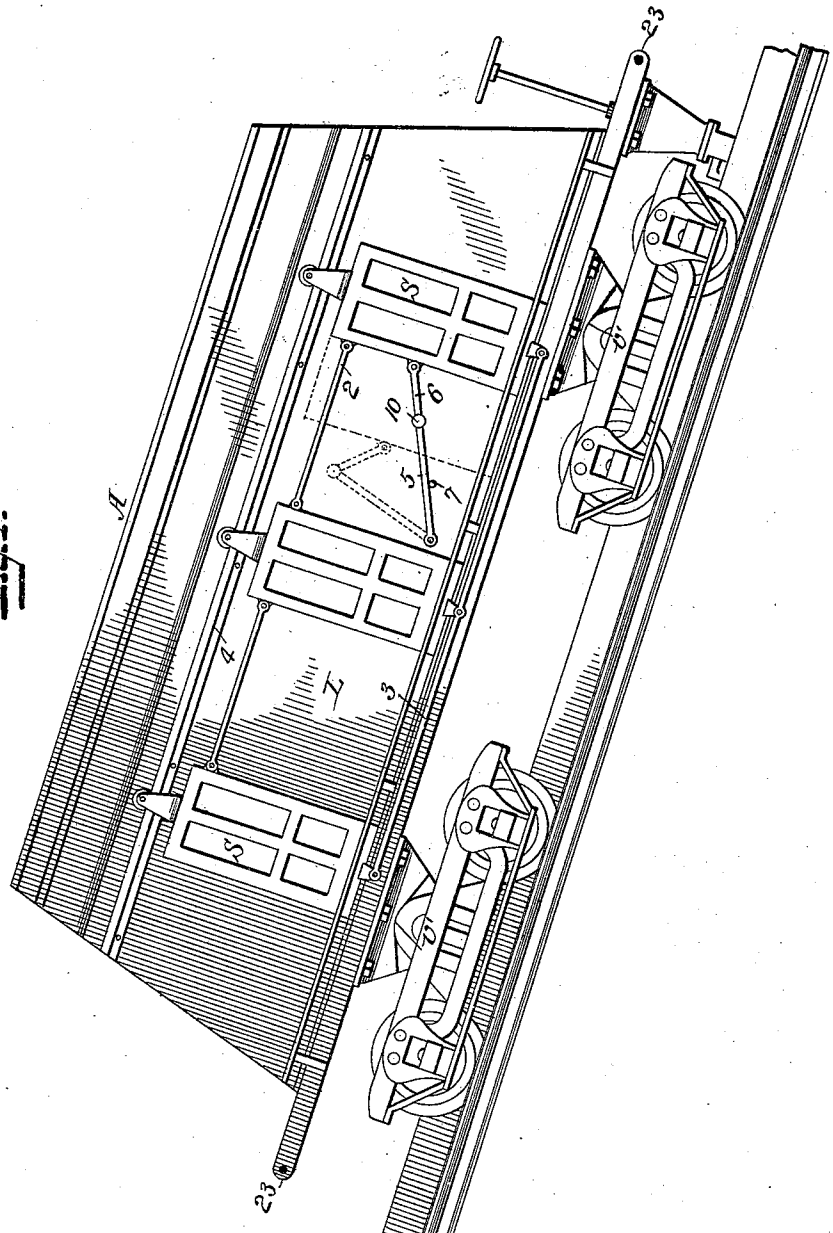


Fig. 1.

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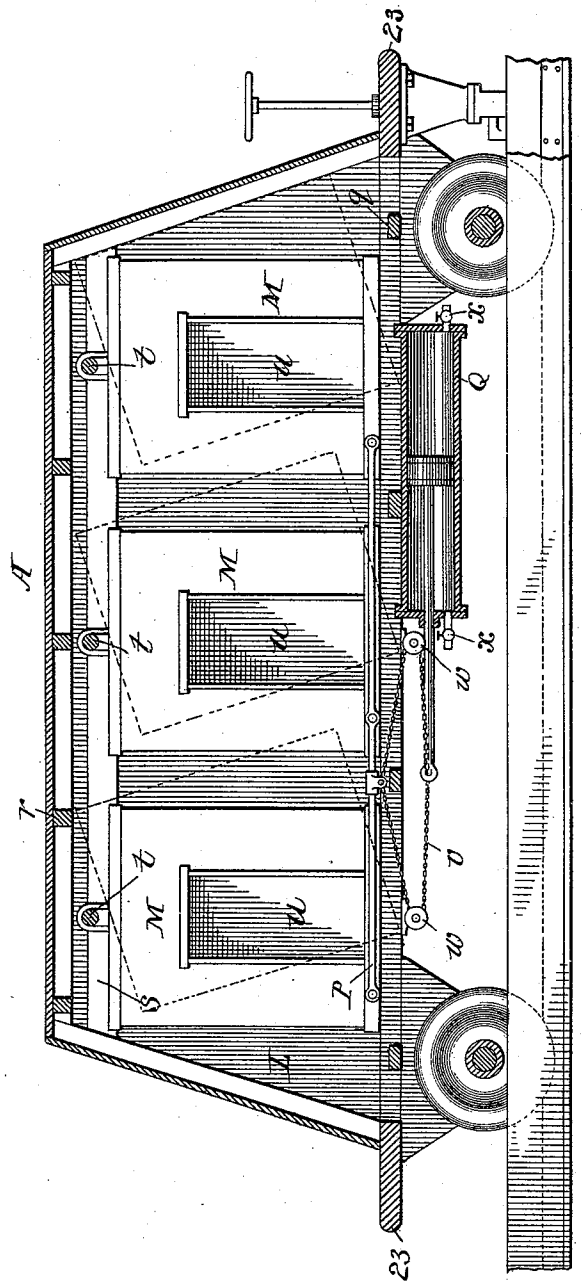
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Fig. 2.



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Fig. 3.

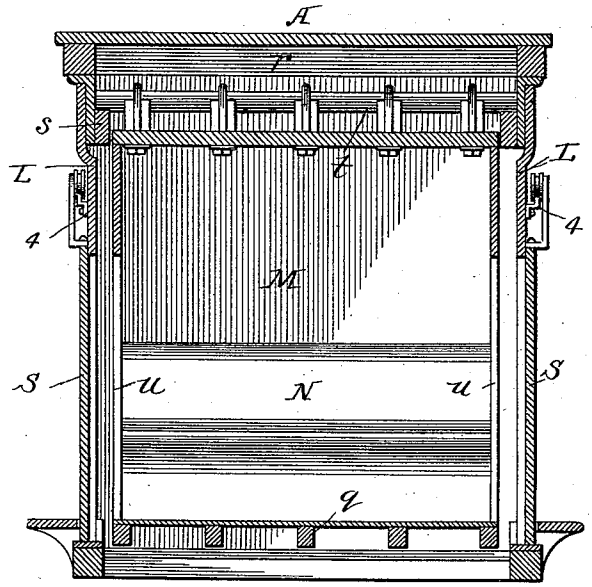
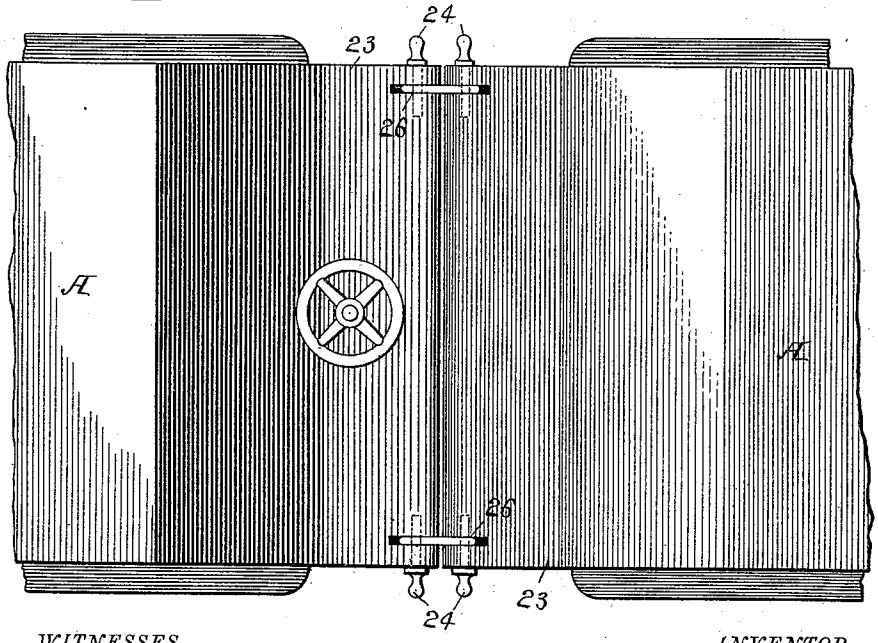


Fig. 4.



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UNITED STATES PATENT OFFICE.

BENJAMIN S. HENNING, OF NEW YORK, N. Y.

RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 446,065, dated February 10, 1891.

Application filed May 17, 1890. Serial No. 352,132. (No model.) Patented in France August 12, 1889, No. 200,163; in England August 14, 1889, No. 12,828; in Belgium August 31, 1889, No. 87,350; in Italy October 3, 1889, No. 288, and in Canada January 2, 1890, No. 33,270.

To all whom it may concern:

Be it known that I, BENJAMIN S. HENNING, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Railway-Cars, (for which I have obtained patents in England, dated August 14, 1889, No. 12,828; in France, dated August 12, 1889, No. 200,163; in Belgium, dated August 31, 1889, No. 87,350; in Italy, dated October 3, 1889, No. 288, and in Canada, dated January 2, 1890, No. 33,270,) of which the following is a specification.

My invention relates to improvements in cars, and more particularly to railway and tramway cars adapted to railways having steep inclinations and abrupt changes in grade, such as that described in my patent, No. 408,711, dated August 13, 1889; and it consists in various improvements, which will be fully described hereinafter, and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a view of a car embodying my improvements. Fig. 2 is a longitudinal sectional view. Fig. 3 is a transverse sectional view, and Fig. 4 is a detail.

For the purposes of this application I shall suppose a railway without horizontal curves and having level portions and heavy grades at intervals, such as that described in the above-mentioned patent.

Some of the improvements to be hereinafter described will be found of general application; and therefore I do not limit myself to their use on any particular cars or railways.

The general object of my invention is to provide a car which shall be safe and comfortable upon steep grades, and by the use of which the advantages of such grades for the purposes of rapid transit and economy of motive power may be utilized by giving full sway to the force of gravity.

In outline the car A is of much the usual form, except that I prefer to incline the ends upward and backward toward the middle of the car, for the double purpose of preventing collision of the upper portions of adjacent cars at abrupt changes in grade and to provide as much room as possible for the swinging compartments within the car, to be described hereinafter.

In consequence of the angle assumed by the cars on the inclines of the track, it is requisite to provide some means for maintaining the horizontal position of the seats occupied by travelers. One means of effecting this is to suspend each seat and its foot-rest between suitable supporting-brackets upon pivots higher than the seat, which will therefore maintain its proper position, whatever may be the position of the body of the car. I prefer, however, to provide each car with one or more compartments swinging on bearings at either the bottoms, sides, or tops.

In Figs. 2 and 3 the side frames L L of the car-body are in the form of strong girders connected above and below by cross-braces *q r* with diagonals, if necessary, the ends being strongly braced by cross-bars and rods, so as to form a hollow structure of great strength resting upon the wheels. Within this frame, and to the upper beams or portions of the side frames, are secured bearings *s* for the journals of cross-bars *t*, to which are connected the compartments M, each consisting of a strong cage similar to an elevator-cage, with seats N N at the opposite ends, and each with a door *u* opening at one side, in position to coincide with a similar opening in the side of the car-body when the latter is horizontal. The cages M will retain their vertical position, swinging from their bearings as the angle of the car-body changes the angular position of the ends of the cars. To prevent the sudden movements of the cages, or any reciprocation, vibration, or oscillation, I prefer to connect them all together, as, for instance, by a rod P connected with each cage, and I combine with the said rod a brake, which will prevent its sudden movement, while allowing it to change its position gradually. One form of brake is illustrated in Fig. 2 as consisting of a cylinder Q, containing a piston, the piston-rod of which is connected to a continuous chain *v*, passing round guide-pulleys *w w* and attached to the rod P. The cylinder Q contains air, which is supplied to the opposite

ends through petcocks x x, which supply air with sufficient rapidity to permit the piston to move slowly, but prevent its sudden motion.

In order to reduce the liability of derailment, as well as prevent oscillation of the cars when a train is employed, I connect the ends of the cars together positively by longitudinally-unyielding couplings, so as to form, as nearly as practicable, one continuous structure, while allowing for such play as may be necessary in consequence of the angle the cars assume to each other in traveling from the level to the inclined portion of the track. One such connection is shown in Fig. 4, in which the bumper-rails 23 of the cars are rounded to conform to circles, at the centers of which are transverse pivots 24, each passing through the eye of a connecting-link 26. This permits the two car-frames to assume different angles to each other, while always bearing one on the other and held in positive movable contact.

It is desirable in order to expedite transportation to empty and refill the cars as speedily as possible. To this end I provide each car with side openings, as before described, and these openings I close by means of sliding doors S S, said doors being suspended from a suitable rail 4 and being connected together by rods 2 3, so that when one is moved the others will move with it, the doors being thereby all closed simultaneously. To facilitate the application of power to close the doors I use two jointed levers 5 6, connected at one end to one of the doors and at the other end to the side of the carriages, with handles 10 at the upper pivotal points, whereby the levers may be brought toward the straight line to close the doors, said levers when in line resting against a stop 7, which prevents them from passing beyond said line and locks the doors in place until the handle 10 is thrust upward to break the joint.

I may arrange the supporting-wheels in single pairs, as shown in Fig. 2, or on trucks, as illustrated in Fig. 1. In cases where trucks are used they should be provided with rounded bearings v', permitting the trucks to assume angles to the car-bodies and adapt themselves to changes in grade.

Without limiting myself to the precise construction shown and described, I claim—

1. The combination, with a railway-car adapted to a horizontal and inclined track, of seats and connected foot-rests suspended within the car and arranged to swing into horizontal position when the car is on an inclined portion of the track, substantially as described.

2. The combination, in a railway-car, of a casing or frame supported by the wheels, and one or more swinging compartments or sections pivoted within said frame and arranged to swing into horizontal position when the car is on an inclined track, substantially as described.

3. The combination, in a railway-car, of a frame, one or more sections or compartments pivoted within said frame, and a brake device for retarding the movements of the sections, substantially as described.

4. A railway-car having two longitudinally and laterally unyielding side couplings upon either end, said couplings being attached directly to the car-body and constructed to allow the two car-frames to assume different vertical angles to each other, substantially as described.

5. In a railway-car, the curved bumpers extending across the ends of the cars, and connecting coupling means, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BENJAMIN S. HENNING.

Witnesses:
ALESE CURTIS,
EDW. B. HAWKINS.