(No Model.) 4 Sheets—Sheet 1.

W. F. RICHARDS.

CAR BUFFER.

No. 566,018. Patented Aug. 18, 1896.

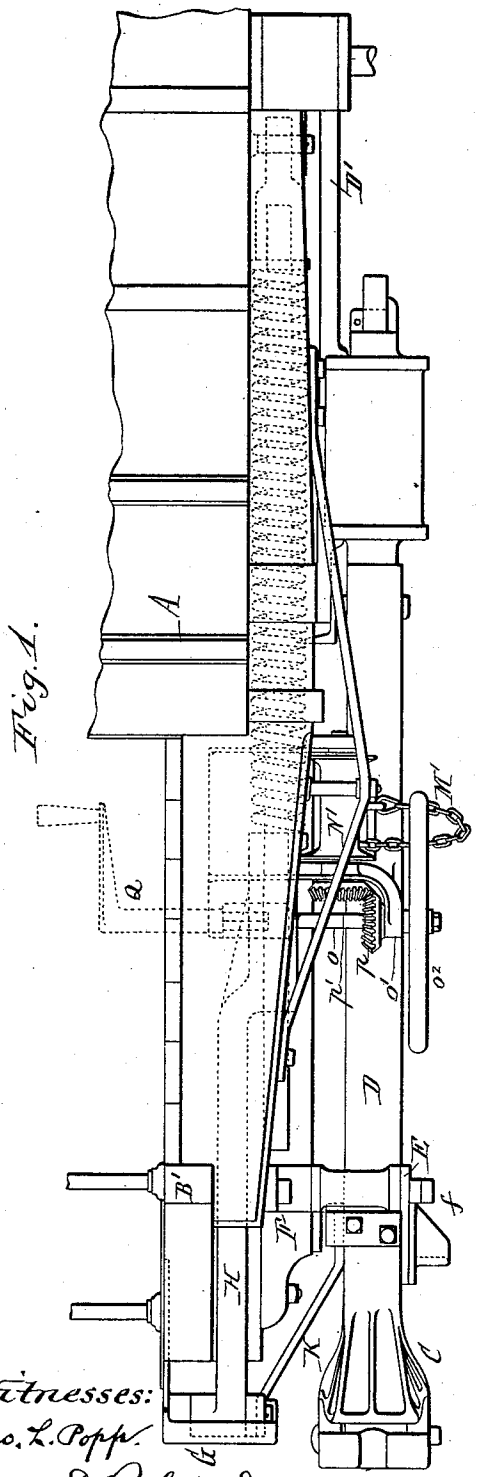

Fig. 1.

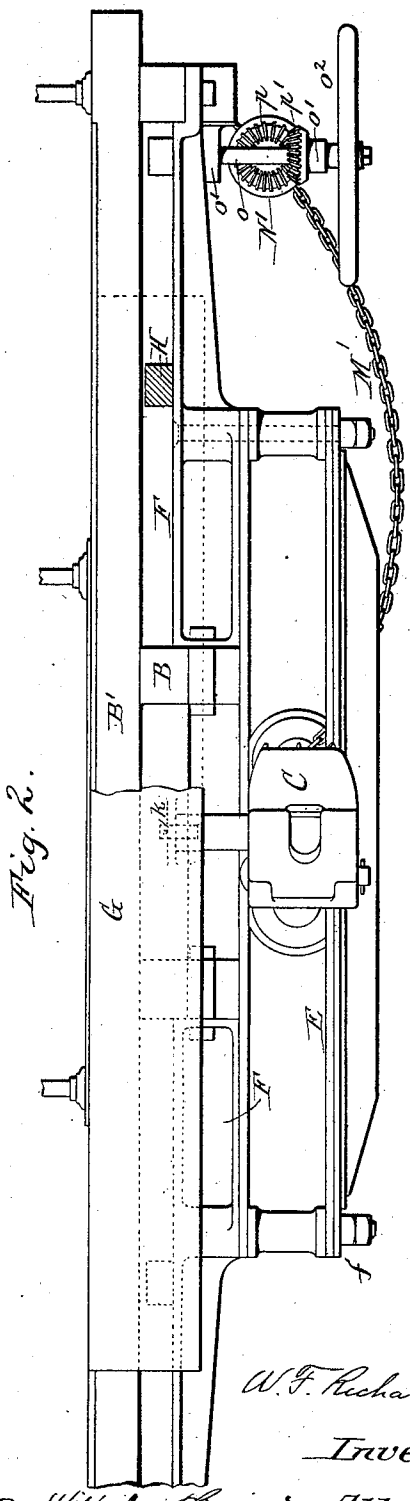

Fig. 2.

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(No Model.)

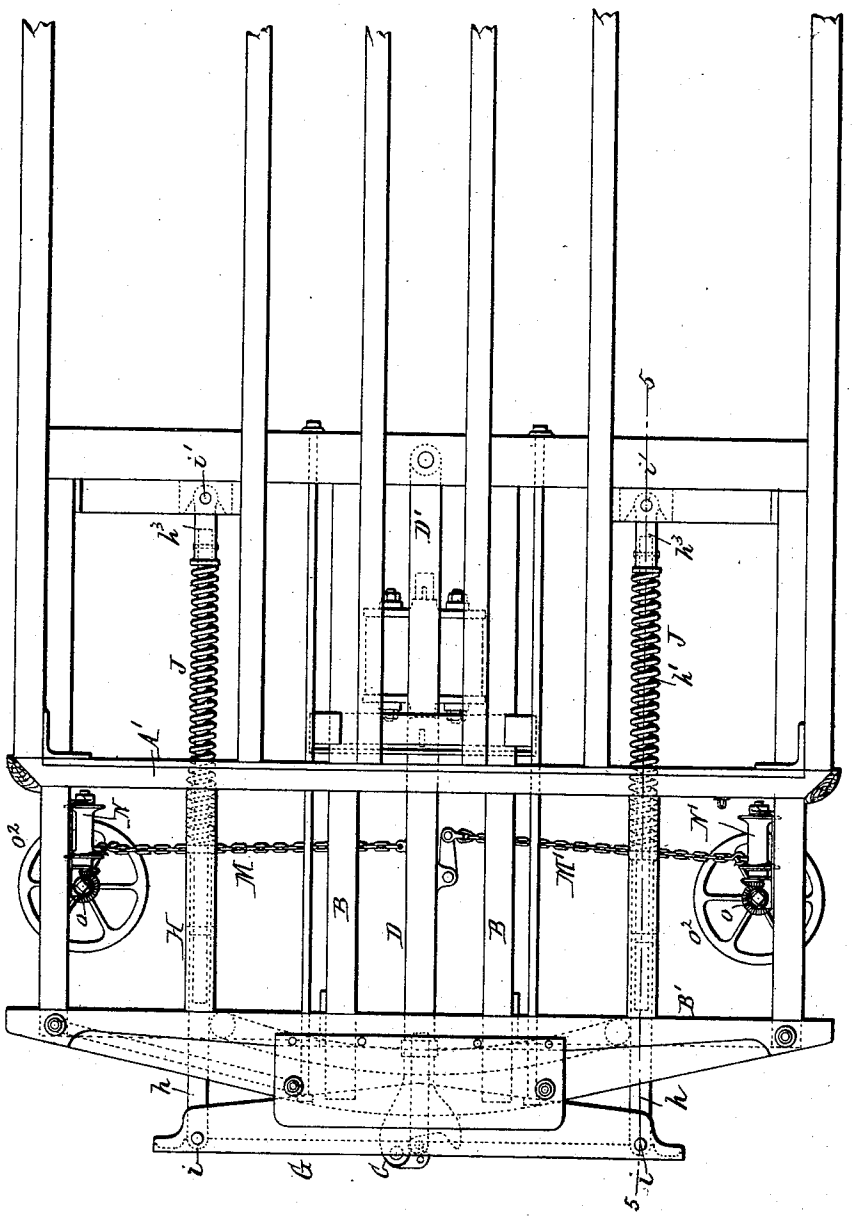
4 Sheets—Sheet 2.

W. F. RICHARDS.

CAR BUFFER.

No. 566,018. Patented Aug. 18, 1896.

Fig. 3.



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(No Model.) 4 Sheets—Sheet 3.

W. F. RICHARDS.

CAR BUFFER.

No. 566,018. Patented Aug. 18, 1896.

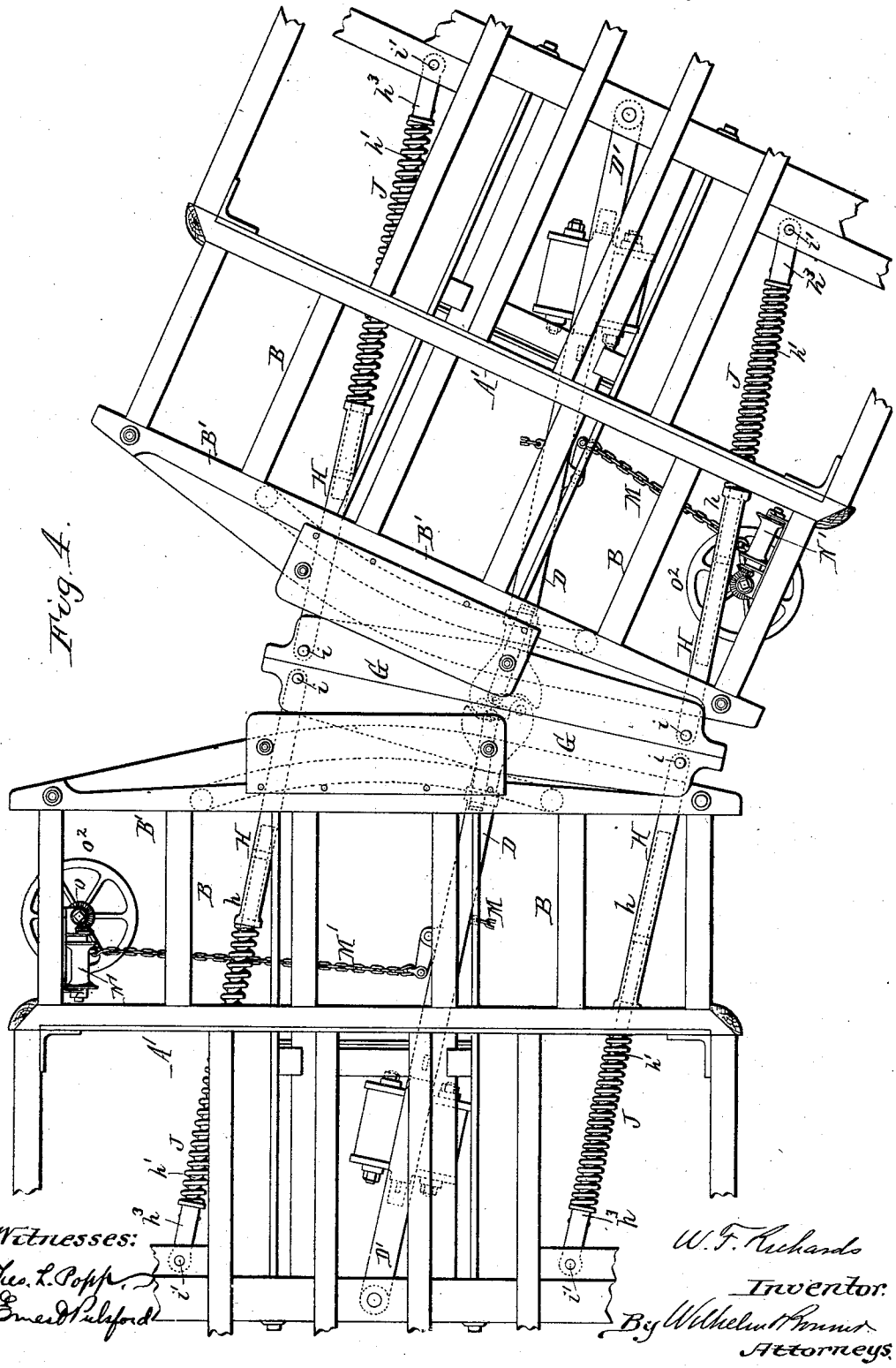

Fig. 4.

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(No Model.) 4 Sheets—Sheet 4.

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CAR BUFFER.

No. 566,018. Patented Aug. 18, 1896.

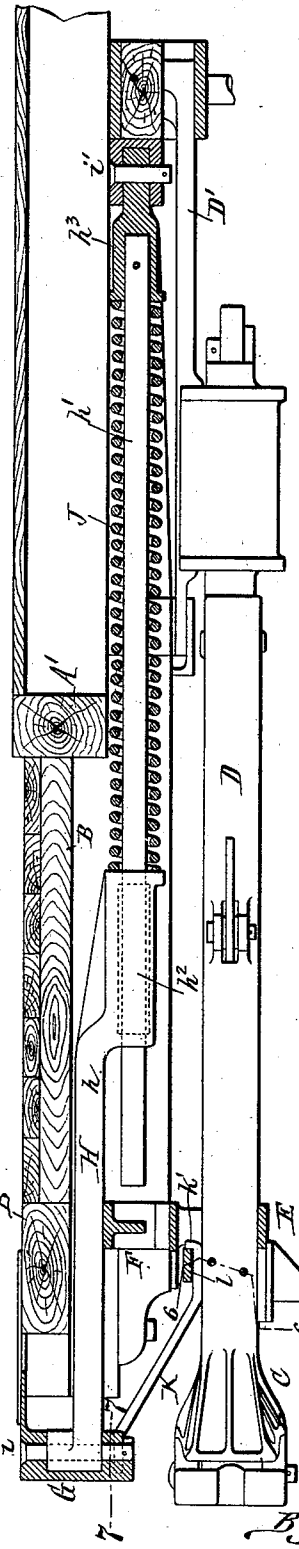

Fig. 5.

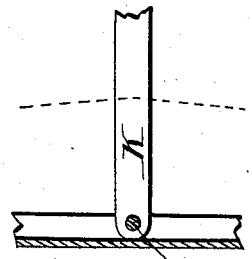

Fig. 7.

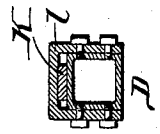

Fig. 6.

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By Wilhelm Bonner
Attorneys

UNITED STATES PATENT OFFICE.

WILLARD F. RICHARDS, OF BUFFALO, NEW YORK, ASSIGNOR TO THE GOULD COUPLER COMPANY, OF NEW YORK, N. Y.

CAR-BUFFER.

SPECIFICATION forming part of Letters Patent No. 566,018, dated August 18, 1896.

Application filed April 27, 1896. Serial No. 589,283. (No model.)

To all whom it may concern:

Be it known that I, WILLARD F. RICHARDS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Car-Buffers, of which the following is a specification.

This invention relates to a car-buffer designed more especially for the cars of elevated railroads and other roads having sharp curves.

In rounding short curves opposing cars of a train assume a considerable angle to each other, and in order to permit their draw-bars to remain in the line of draft the same are pivoted to the car-frame at their rear ends, so as to allow the necessary lateral play thereof. In order to maintain a close connection between the buffers and obtain a continuous passage-way between the cars upon sharp curves as well as on straight sections of track, the buffers have been made bodily movable toward either side of the car and provided with centering or return springs for restoring them to their central position after passing a curve. This construction is, however, objectionable, because the spring or springs, which are compressed when the buffer is moved laterally on curves, tend to crowd the wheels on one side of the car laterally against the rail, producing sharp wheel-flanges and incurring the danger of derailing the cars on switches.

My invention has for its objects to produce a car-buffer which overcomes the above-mentioned objection, while at the same time maintaining a close contact with an opposing buffer under all conditions, and which is applicable to existing elevated-railway cars without requiring any material alterations or interfering with any parts of the structure.

In the accompanying drawings, consisting of four sheets, Figure 1 is a fragmentary side elevation of such a car provided with my improved buffer. Fig. 2 is an end view thereof with a portion of the buffer broken away and showing one of its stems in section. Fig. 3 is a fragmentary top plan view of the car, on a reduced scale, with the flooring of the platform and car-body omitted and showing the buffer in its normal central position. Fig. 4 is a similar view of two coupled cars, showing the position of the buffers and connecting parts upon a curve. Fig. 5 is a vertical longitudinal section in line 5 5, Fig. 3, on an enlarged scale. Fig. 6 is a cross-section in line 6 6, Fig. 5. Fig. 7 is a fragmentary horizontal section in line 7 7, Fig. 5.

Like letters of reference refer to like parts in the several figures.

A is the car-body; A′, its end sill; B, the longitudinal platform-sills, and B′ the end sill of the platform.

C is the car-coupler, which is preferably of the automatic type now in common use, and D is the shank or draw-bar, having its rear end pivotally connected with the car-frame in any suitable manner, so that the coupling is free to swing laterally to the requisite extent. In the construction shown in the drawings, which is the one now generally employed on the cars of elevated railroads, the draw-bar is attached to a laterally-swinging bar D′, pivoted at its rear end to the car-frame and carrying springs and followers which resist the inward and outward movements of the draw-head in a well-known manner. The draw-head is supported on a transverse carrier-iron E, suspended by vertical bolts *f* from transverse beams or supplemental carrier-irons F. The latter are arranged on opposite sides of the center sills of the platform and are secured to said sills and the outer sills by bolts or other suitable fastenings, as shown in Fig. 2.

G is the buffer, which preferably consists of a continuous vertical plate arranged transversely in front of the end sill of the platform and extending nearly to the sides of the platform. The buffer is carried by two longitudinal stems or bars H, extending rearwardly from the buffer and pivoted at their front ends to the end portions of the buffer by vertical pins or bolts *i* and at their rear ends to a part of the car-frame by similar bolts *i′*, so as to permit the buffer to swing bodily toward either side of the car, as shown in Fig. 4. The buffer-stems are arranged on opposite sides of the center of the car and their front portions are supported on the carrying-irons F, on which they are free to slide laterally within the limits of the outer and center sills, as shown in Fig. 2.

In order to permit the necessary inward and outward movement of the buffers, their stems are preferably composed of two sections h h', capable of moving lengthwise on each other, as shown. The front section h, which is pivoted to the buffer by the pin i, is provided at its rear end with a longitudinal socket or sleeve h^2, in which the front portion of the rear section h' slides, as most clearly shown in Fig. 5. The inner section h' is provided at its rear end with a cap h^3, having a lug through which the pivot-pin i' passes. Each buffer-stem carries a comparatively long buffer-spring J, which surrounds its rear section between the cap h^3 of the latter and the socket h^2 of the front section. These springs tend to force the front sections of the buffer outwardly, so as to press the buffer against an opposing buffer and resist its inward movement. The front section of each buffer-stem is offset above the plane of the rear section, and the latter is arranged underneath the end sill of the car-body, as shown in Fig. 5. This arrangement permits the buffer to be placed at the proper elevation with reference to the car-coupler and avoids cutting away the end sill of the car-body, which would be necessary if the rear portion of the stems were in the same horizontal plane as their front portions.

In order to control the lateral movements of the buffer and return the same to its normal position without the use of squaring-springs, the same is coupled with the draw-bar D by a connection which compels the buffer to follow the movements of the draw-bar and to maintain the proper position to form a close joint with an opposing buffer under all conditions. In the construction shown in the drawings, this connection consists of a longitudinal link K, pivoted at its front end to the middle of the buffer by a vertical pin or bolt k, and engaging with its rear portion in a loop or yoke l, arranged on the upper front portion of the draw-bar. This link is arranged to slide lengthwise to a limited extent in the loop l to permit the necessary inward and outward movements of the buffer independently of the car-coupler, and for this purpose the rear portion of the link is horizontal and provided at its rear end with a lip or toe k' for preventing withdrawal of the link from the loop and limiting the outward movement of the buffer when the cars are uncoupled. The buffer has the usual horizontal plate or wing, which extends rearwardly over the platform-sill and which is overlapped by a floor or threshold plate secured to the platform.

As the coupled draw-bars of the cars are taut or under tension and are pivoted at their rear ends they tend to remain in the line of draft, and when the cars pass around a curve the draw-bars move laterally at an angle to the longitudinal center line of the cars, or, more properly speaking, the draw-bars remain in a straight line, passing through the rear pivots of the two bars, and the ends of the car-bodies swing at an angle to the draw-bars, as shown in Fig. 4. As the buffers are connected with the draw-bars by the links K they are compelled to remain at all times in substantially the same relative position to the draw-bars, thus maintaining the faces of the opposing buffers squarely against each other in all positions of the cars, which would not be the case in the absence of the connecting-links K. As soon as the cars pass upon a straight section of track they again swing into line with each other, bringing the buffers and the draw-bars to their normal central position.

Although the movement of the buffers on each other is checked by their springs, which latter are under compression when the cars are coupled, they are compelled to take part more or less in the rolling and oscillating motions of the cars. As the draw-bars are under tension they are unaffected by such motions, and in order to relieve the link K from the strains to which it would otherwise be subjected the same is arranged loosely in the loop l, as shown in Fig. 6, so that it may swivel in the same and follow the oscillations of the buffers without restraint from the draw-bars. This lateral play of the rear portion of the link also permits the car-coupling to continue its lateral movement independently of the buffer in rounding a curve after the buffer reaches the limit of its lateral movement, the dimensions of the platform and the arrangement of its outer sills being such that the stems of the buffer strike against said sills before the coupling reaches its extreme lateral limit. By the employment of this link the buffer is caused to always remain in contact with an opposing buffer without the use of return-springs, and the lateral crowding of the car-body caused by such springs on curves is therefore obviated, thereby avoiding all danger of producing sharp wheel-flanges.

When the cars are uncoupled on a curve, the draw-bars and the buffers are on one side of the car, and as they have no centering-springs it is necessary to move them into their central position by hand. To avoid entering between the cars for this purpose, suitable shifting devices are preferably arranged on the car-platform at opposite sides thereof. The shifting devices shown in the drawings consist of a pair of chains M M', connected with opposite sides of the draw-bar and wound, respectively, upon horizontal drums N N', arranged lengthwise underneath the platform and journaled in suitable bearings secured to the platform-sills. These drums are actuated from short upright shafts or staffs o, arranged near opposite sides of the platform and turning in bearings o', secured to the platform. Motion is transmitted from these shafts to the drums by intermeshing bevel-gears p p'. Each of the shafts is provided below the platform with a hand-wheel o^2, whereby it may be turned by an attendant standing on the ground or the usual platforms of elevated

roads. The shafts preferably extend upward through the platform and are formed with a flat-sided upper end, as shown in Figs. 3 and 4, so that, if desired, the same may be turned with a suitable hand-crank Q by a person standing on the platform. This hand-crank is shown by dotted lines in Fig. 1 and is detachable, so that the same crank may be used for turning either shaft. Sufficient slack is left in both of the chains M M′ to allow the draw-bar and buffer to swing to either extremity of their lateral movement without restraint. When it is desired to shift the draw-bar and buffer from either side of the car to their central position, the chain on the side of the car toward which the parts are to be swung is simply wound upon its drum by turning the corresponding actuating-shaft, and the chain is then partly unwound or allowed to unwind by its weight to give it the necessary slack.

I claim as my invention—

1. The combination with the car-frame and a laterally-movable draw-bar, of a buffer capable of moving toward either side of the car, and a flexible connection which is attached at one end to the buffer and at its opposite end to the draw-bar and which permits the buffer to vibrate laterally with the car-frame independently of the draw-bar upon straight sections of track, while compelling the buffer to swing laterally with the draw-bar in rounding curves, substantially as set forth.

2. The combination with the car-frame and a laterally-movable draw-bar, of a buffer capable of moving toward either side of the car and a link pivoted at its front end to the buffer and having a sliding connection with the draw-bar at its rear end, substantially as set forth.

3. The combination with the car-frame and a laterally-movable draw-bar having a yoke or loop, of a buffer capable of moving toward either side of the car, and a link attached at its front end to the buffer, sliding with its rear portion in the loop of the draw-bar and provided at its rear end with a lip or projection adapted to bear against the rear edge of said loop, substantially as set forth.

4. The combination with the car-frame and the platform, of a laterally-movable draw-bar, a transverse buffer-plate arranged at the end of the platform, laterally-swinging stems pivoted at their front ends to opposite ends of the buffer-plate and at their rear ends to the car-frame, and a connection between the buffer-plate and the draw-bar, whereby the buffer is compelled to move laterally with the draw-bar, substantially as set forth.

5. The combination with the car-frame and the platform, of a transverse buffer-plate arranged at the end of the platform, laterally-swinging supporting-stems each composed of a rear section pivoted to the car-frame, and a front section movable lengthwise on the rear section and pivoted at its front end to the buffer-plate, and springs applied to said buffer-stems and resisting the movement of the front sections on the rear sections, substantially as set forth.

6. The combination with the car-frame and the platform, of a transverse buffer-plate arranged at the end of the platform, laterally-swinging supporting-stems each composed of a front section pivoted at its outer end to the buffer-plate and provided at its rear end with a socket, and a rear section pivoted to the car-frame and sliding in said socket, and springs applied to said rear sections, and bearing at their front ends against said sockets, substantially as set forth.

7. The combination with the car-frame and the platform, of a transverse carry iron or beam arranged underneath the platform, a buffer-plate having a laterally-swinging stem or stems sliding on said carry-iron, and a transverse carry iron or beam for the draw-bar arranged below the first-named carry-iron and secured thereto, substantially as set forth.

8. The combination with the car-platform, the laterally-movable draw-bar, and the laterally-movable buffer connected therewith, of drums journaled on the platform, chains wound thereon and secured to opposite sides of the draw-bar, and means for turning said drums, substantially as set forth.

9. The combination with the platform, the laterally-movable draw-bar and the laterally-movable buffer connected therewith, of horizontal drums journaled underneath the platform, chains wound thereon and attached to opposite sides of the draw-bar, upright shafts turning in bearings secured to the platform, and bevel-gears whereby the motion of said shafts is transmitted to said drums, substantially as set forth.

Witness my hand this 13th day of April, 1896.

WILLARD F. RICHARDS.

Witnesses:
JNO. J. BONNER,
ELLA R. DEAN.