(No Model.)

A. G. LEONARD.

DEVICE FOR UNITING CARS.

No. 543,032. Patented July 23, 1895.

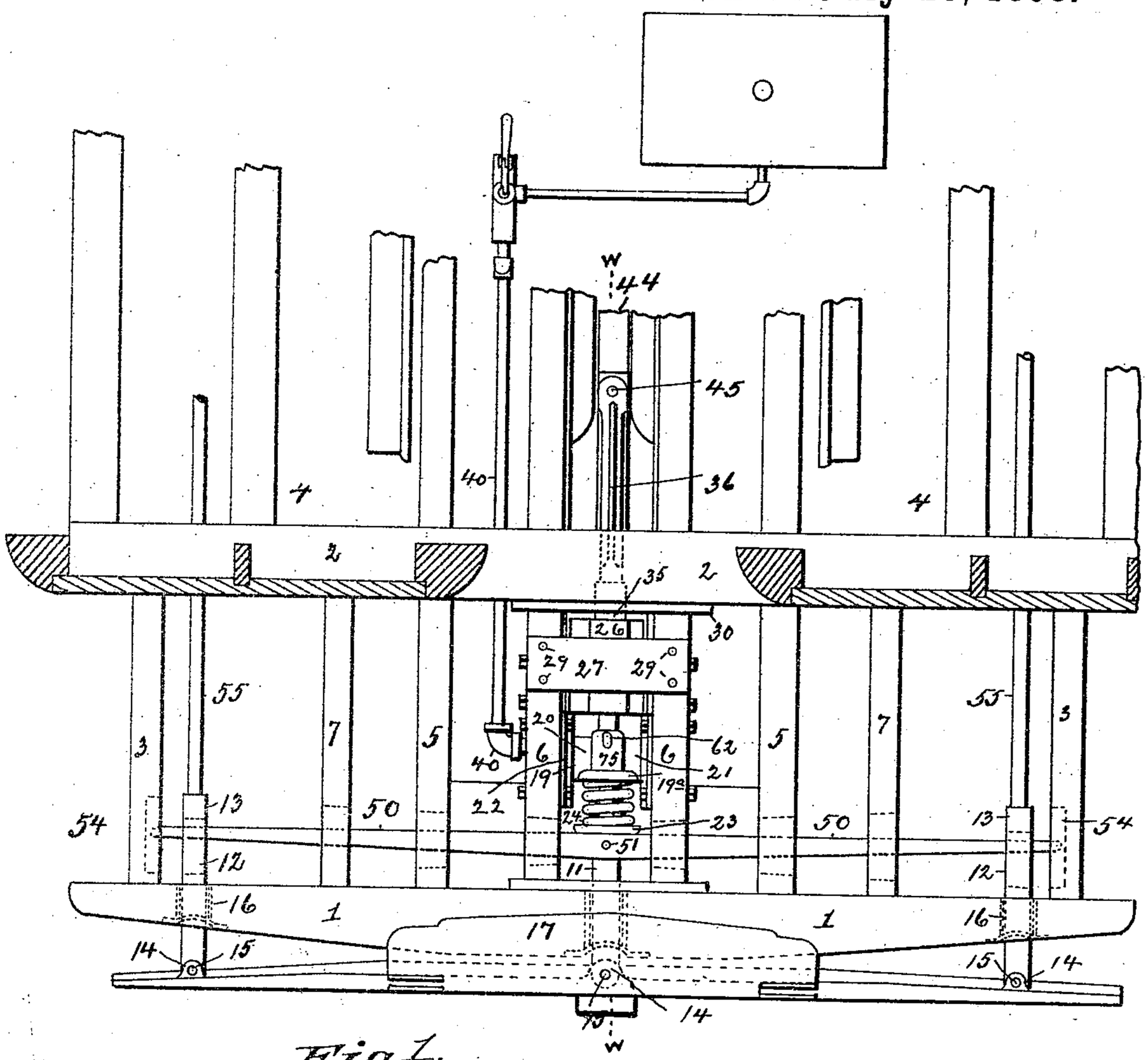

Fig. 1.

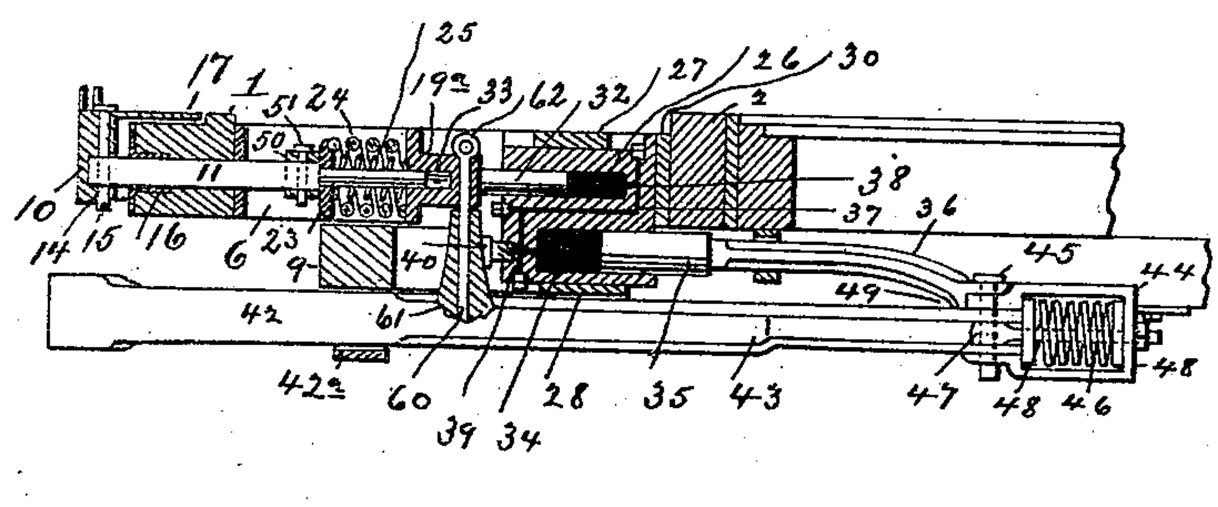

Fig. 2.

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UNITED STATES PATENT OFFICE.

ARTHUR G. LEONARD, OF NEW YORK, N. Y.

DEVICE FOR UNITING CARS.

SPECIFICATION forming part of Letters Patent No. 543,032, dated July 23, 1895.

Original application filed July 10, 1893, Serial No. 480,014. Divided and this application filed March 9, 1894. Serial No. 503,018.

(No model.)

To all whom it may concern:

Be it known that I, ARTHUR G. LEONARD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have made certain new and useful Improvements in Devices for Uniting Cars, of which the following is a specification.

My invention pertains to means for uniting cars for steam-railroads, and it relates more particularly to the class of car-uniting mechanisms shown in an application for Letters Patent of the United States which I filed on July 10, 1893, Serial No. 480,014, the present application being substantially a division of said application, wherein the features of the invention hereinafter set forth and claimed were shown and described but not specifically claimed.

My invention relates to means for increasing the safety of railroad-trains by more firmly uniting the cars together than has been practiced before my invention for uniting cars, by which means the car-bodies are held in their proper relative positions and the amount of movement of one car with relation to an adjoining car is greatly reduced, the effect being to cause the cars to retain a substantially normal level under the varying conditions of travel.

In my said invention set forth in said application I employ, among other things, a friction-plate at the end of the car, which plate is pressed forward by devices actuated by hydraulic mechanism, and I so arrange the parts that the draw bar or hook will have movement coextensive with the movement of said friction-plate, and the object of my present invention is to provide means for maintaining the friction-plate and draw-bar in their projected and retracted positions.

To this end my invention consists in means for rigidly uniting the friction-plate-actuating devices and the draw-bar when desired, so that there will be no individual or independent movement of the friction-plate with relation to the draw-bar.

The invention further consists in the novel details of improvement and the combinations of parts that will be more fully set forth, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a plan of a detached portion of one end of a car, showing the application of my invention; and Fig. 2 is a central longitudinal elevation on the line *w w* in Fig. 1 and on the same scale as that figure.

In my present invention I have shown a structure to which my improvement is specially applicable, the particular features of which I have made the subject of a separate application, which I have filed in the Patent Office of even date herewith.

The said construction I will now set forth to more fully explain the application of my present improvement thereto; but it will be understood that my said improvement can be applied to structures differing in detail to that set forth herein but embodying the same general ideas.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the several views thereof, the forward end of the platform is defined by the buffer-beam 1, which in this case, as in the usual practice, is as wide as the car, and at a certain distance to the rear of the buffer-beam lies the front or cross door-sill 2.

Between the door-sill at both ends of the car extend longitudinal outer sills 3, and between the cross or door sills at each end of the car extend the inner longitudinal sills 4 5 6, the sills 5 6 extending past the door or cross sills to the buffer-beam, to which it is secured in the usual way, and which form part of the platform-body. Between the door-sill 2 and the buffer-beam extends the step-sill 7, which defines the width of the platform proper. Below the sills 5 6 run additional sills 8, which lie directly below the sills 5 6. The forward ends of each of these sills abut against or are affixed to a cross-timber 9. As the sills 8 are subjected primarily to the first strain of pulling the car, as well as the strain of compressing the draw-bar springs, they may be braced longitudinally by tie-bolts passing from the cross-timber 9 to the door-sill 2 or extending to the other end of the car to a like cross-timber, as may be desired, or as more particularly set forth in my above-mentioned appli-

cation, and for a more particular and detailed description of the platform and connected parts which I prefer to use with my improved car-uniting structure I refer to my said above-mentioned application.

10 indicates the friction or face plate, which is illustrated as adapted for a vestibuled car, but they may be of any desired shape, so long as they are of sufficient length and have sufficient contact-surface to enable them to perform the work which is required of them.

As shown in Fig. 1, the friction-plate 10 is carried by three stems 11 12 13, to which stems said plate 10 is pivotally connected. Said stems may be pivotally connected with said friction-plate 10 in any desired manner; but I have shown said plate as provided with side lugs 14, that receive pins 15, that also pass through said stem. The stems 11 12 13 pass through the buffer-beam 1, or rather through suitable openings formed therein. The apertures in said beam are preferably provided with a guide-casting 16, through which said stems pass.

At 17 is shown a sill-plate that lies partially over the buffer-beam 1, and which is preferably constructed as shown, the friction-plate 42 depending therefrom and extending from opposite sides thereof.

The rear end of the stem 11 is rounded and passes through a spring-plate 18 in advance of a cross-head 19, provided at the side with ears 20, which work in the guideways 21, formed on the plate 22, secured in place within the sills 6. Against the shoulder formed at the intersection of the rounded and squared portion of the stem 11 lies a spring-plate 23, cast to receive one end of a spiral spring 24, which encircles the rounded portion of the stem 11, and within the spring 24 and about the stem 11 lies an auxiliary spring 25. Both springs abut against the annular part 19^a on the cross head 19. A duplex hydraulic cylinder 26 is supported and fixed in position between the sills 6 and 8 by means of the straps or cross-bars 27 28 above and below the cylinders, being united together by bolts 29, which serve also to hold the sills 6 and 8 together. The rear of the cylinder 26 abuts against a plate 30, which in turn lies up against the cross-sill 2. The upper portion of the cylinder 26 is provided with a cylindrical chamber 31, in which is adapted to work a suitable ram or plunger 32, the forward end of which abuts against the barrel 33 of the cross-head 19. Below the chamber 31 is another chamber 34, in which is adapted to work a suitable ram or plunger 35, the rear end of the plunger engaging with the forward end of the push-bar 36. The chamber 31 and the plunger 32 are both smaller in diameter than the chamber 34 and plunger 35; but this need not be so of necessity, and both plungers may be provided with suitable packing, if desired.

The chambers 31 and 34 have a communicating-passage 37 formed in the cylinder 26, from which lead ports 38 39 into the chambers 31 34 respectively, and opposite the port 39 is tapped a hole into which a pipe 40 enters, suitable plugs being used for closing up the ends of the channel 37. This simply illustrates the method of making the channels and ports in the cylinder, they having been drilled instead of being formed by casting. Said cylinder may be further supported and the other parts constructed as particularly set forth in my above-mentioned application, if desired. The pipe 40 leads to a force-pump supported in any desired position (preferably within the car) and of any desired construction and connected with a suitable tank containing water and other suitable fluid, and for a full description of a suitable arrangement for this purpose I refer to my application above mentioned.

At 42 is the draw-bar supported in any desirable way, as by a bracket 42^a, carried by the beam 9, the rear end of which, in the instance shown, is constructed of two plates 43, arranged to move in a suitable guideway and against the action of springs in any desirable manner, or, preferably, as follows: A housing 44, that is pivotally connected by a pin 45 with the push-bar 36 and draw-bar 42, contains springs 46 that surround a rod 47, pivoted to the pin 45, followers or plates 48 acting against said springs and against abutments carried by the car-sills, whereby the springs will be compressed as the draw-bar is drawn forward. The push-bar 36 has a toe or projection 49, that bears against the housing 44 to reduce strain on the pin 45. For a more particular description of the above-mentioned parts I refer to my said application above mentioned.

At 50 is an equalizing-bar that is pivotally secured to the stem 11 by a pin 51, the equalizing-bar having an eye 52, through which said stem and pin pass, the spring-plate 23 abutting directly against the back of the eye. The equalizing-lever 50 extends through apertures formed in the sills 5, 6, 7, and passes at its extreme ends through apertures 53 in the stems 12 13 and into recesses 54 in the sills 3, as shown in Fig. 1. The stems 12 13 have extensions 55, that pass through the sill 2, and may, if desired, be suitably supported within a draft-iron having followers and springs constructed in substantially the same way as shown in connection with the draw-bar or in any other desired manner. With this arrangement the forward or rearward movement of the stem 11 will communicate equal corresponding motion to the face-plate 10 and equalizing-lever 50, and the oscillations of the face-plate 10 on its pivot-pin 51 will communicate corresponding motion to the equalizing-lever 50 on its pivot-pin 51.

My improvement for maintaining the friction-plate and draw-bar in the projected and retracted positions is as follows: At 60 is a strong pin which can be passed through an aperture in the barrel 33 of the cross-head 19

and through an aperture in an upwardly-extending pillar 61 carried by the draw-bar, and, if desired, through said draw-bar, as clearly shown in Fig. 2, the parts being so arranged that both apertures will align at a certain point in the projection of the friction-plate and the retraction of the draw-bar, and when aligned the pin 60 can be dropped into said apertures and hold the parts rigidly together. The pin 60 may be provided with an eye 62, so that it can be readily withdrawn, and additional means may be provided for holding the pin intermediate of the cross-head and the draw-bar, so as to hold each rigidly in position and prevent the pin from being broken or sheared.

Of course the part that rigidly unites the cross-head with the draw-bar can be arranged otherwise as to details without departing from the spirit of my invention.

The operation of the hereinabove-described structure and the coaction of my present improvement therewith are as follows: When the springs about the stem 11 and at the end of the draw-bar are not under compression and the cars uncoupled the friction-plate 10 extends out where the movement of uncoupling had left it, and the draw-bar with its coupling-hook has been moved to its position of rest by its springs—that is, the face of the plate may have been moved away from the buffer-beam forwardly, and the face of the coupling-hook will occupy a plane vertically, forward of the friction-plate. These positions of the face-plate and the draw-bar are the normal positions—that is, at the time their springs are not compressed. When two cars are brought together by coupling, in the structures in use at the present time, both the coupler and buffer springs receive the shock, whereas in my construction the coupling-hooks and then the springs of the coupler receive and absorb the shock due to coupling without affecting the friction-plate springs. After the cars are coupled the force-pump is operated, which will move a column of water through the pipe 40 and into the channel 37 of the duplex-cylinder, forcing out the plungers 32 35, the plunger 35 moving the push-rod 36 and housing 44 against the forward follower-plate 48, which will first compress the nest of springs within the housing, the coupling of the cars not having permanently compressed the springs, and move the opposite follower 48 against the rear abutment, and at the same time the plunger 32, which bears against the barrel 33 of the cross-head 19, bringing the cross-head against the nest of springs 24 25, moving the stem 11 forward, forcing out the friction-plate 10, which, when it meets the opposing friction-plate on the next car, enables the springs to be compressed, the conjoint operation being such as to cause the friction-plate of one car to push the opposing car away from it, the rearward movement of the draw-bar, by the simultaneous movement of the plunger 35 and its connections to the draw-bar, meanwhile pulling the opposing car toward it, which will firmly couple and unite both of the guides together and frictionally contact the friction-plates throughout their area of exposed surface. When the face-plate 10 is thus moved outward by the liquid in the cylinder forcing out the stem 11, the stems 12 13 at the ends of said face-plate and the equalizing lever or bar 50 will be correspondingly moved, and the connection of the equalizing bar or lever with said stem is such that when on a curve or when the friction-plate assumes a position radial to the curve the ends of the equalizing bar or lever will strike the ends of the slots in the side stems 12 13, enabling the plunger 32, through the springs 24 25, to keep both ends of the face-plate in contact with the opposing face-plate of the next car, thus distributing the power applied at the center to the ends of the face-plate. When the water or fluid in the duplex cylinder is under compression, an inward movement of the face-plate will cause the fluid to flow and thus press on the plunger 35, causing the latter to retract the draw-bar, and thus the relative positions of the face-plate and the draw-bar will be permanently retained, the springs 24 25 remaining under compression so long as the fluid in the duplex is under pressure; but it will be understood that the springs 24 25 remain under tension and can have proper individual movement, as the fluid in the cylinder acts as a rigid abutment behind said spring, holding them normally under the initial compression.

The peculiar advantages of my improvement are that the abutting ends of two cars are securely united, that proper swinging motion of the cars is permitted, and that at all times the desired degree of pressure between the cars is maintained, and that pressure is applied to the face-plate at its end as well as at its center in whichever position it may assume on account of the movement of one car relatively to the other.

When it is desired to unite the cross-head 19 of the friction-plate devices with the draw-bar, said parts are moved relatively until the apertures in the cross-head 33 and pillar 61 are aligned, whereupon the pin 60 is dropped into said aperture, in which positions the friction-plate and draw-bar will be so united as to cause one to move conjointly and coextensively with the other. While the draw-bar and friction-plate devices are so united by the pin 60, the hydraulic devices will not again be operated to further move the friction-plate and draw-bar until the pin 60 has been withdrawn from its apertures.

Having now described my invention, what I claim is—

1. In a car uniting device, the combination of a buffer beam, a friction plate extended therefrom, a stem extending from said plate, and a hydraulic device to act on said stem, with a draw bar, devices connecting said draw bar with said cylinder, and means for firmly

uniting said draw bar with said stem, substantially as described.

2. In a car uniting device, the combination of a buffer beam, a friction plate extended therefrom, a stem extending from said plate, a cross head connected with said stem, and means for advancing said cross head, said cross head having an aperture, with a draw bar provided with an apertured pillar or arm, and a pin to pass through said apertures to unite said parts together, substantially as described.

3. In a car uniting device, the combination of a buffer beam, a friction plate extended therefrom, a stem connected with said plate, a cross head connected with said stem, said cross head being provided with an aperture, and means for advancing said cross head, stem and plate, with a draw bar, a pillar carried thereby, said pillar having an aperture, and a pin to enter said aperture to firmly unite said parts, substantially as described.

4. In a car uniting device, the combination of a buffer beam, a friction plate extended therefrom, a cross head, a resilient element between said stem and cross head, and means for advancing said cross head, stem and plate, with a draw bar, and means for firmly uniting said draw bar with said friction plate devices, substantially as described.

Signed at New York, in the county of New York and State of New York, this 6th day of March, 1894.

ARTHUR G. LEONARD.

Witnesses:
HENRY B. DWYER,
HENRY B. WHIPPLE.