2 Sheets—Sheet 1.

S. USTICK.

CAR-COUPLING.

No. 178,817. Patented June 13, 1876.

FIG. 1

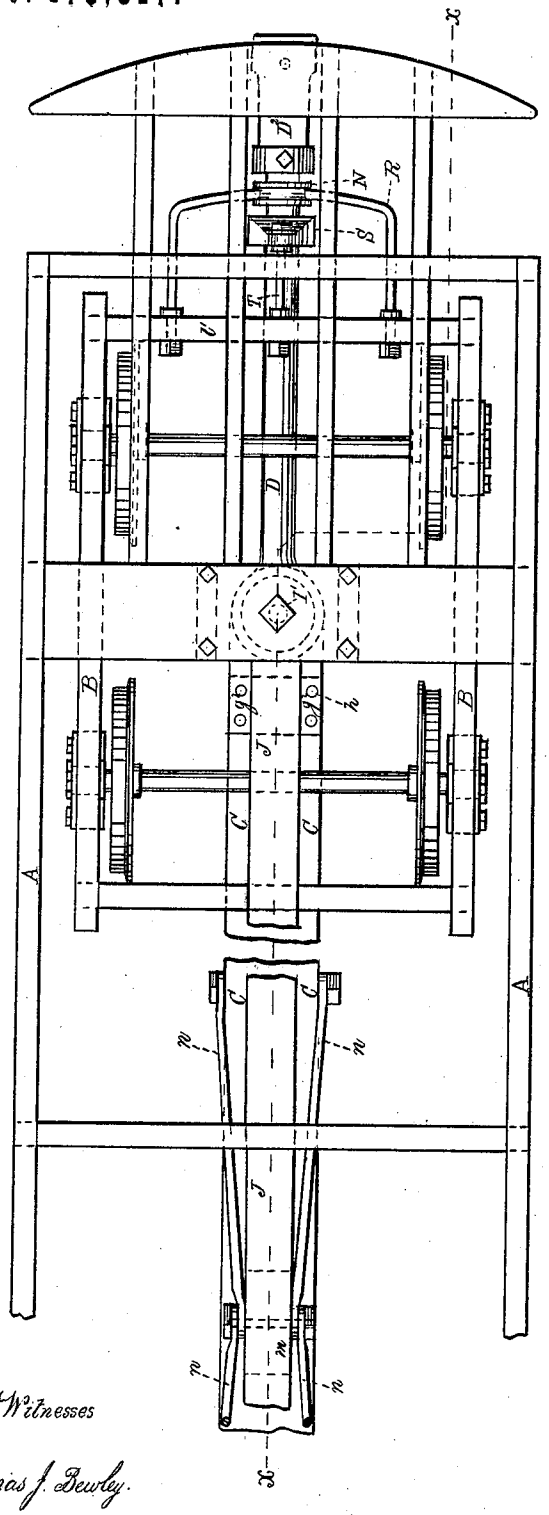
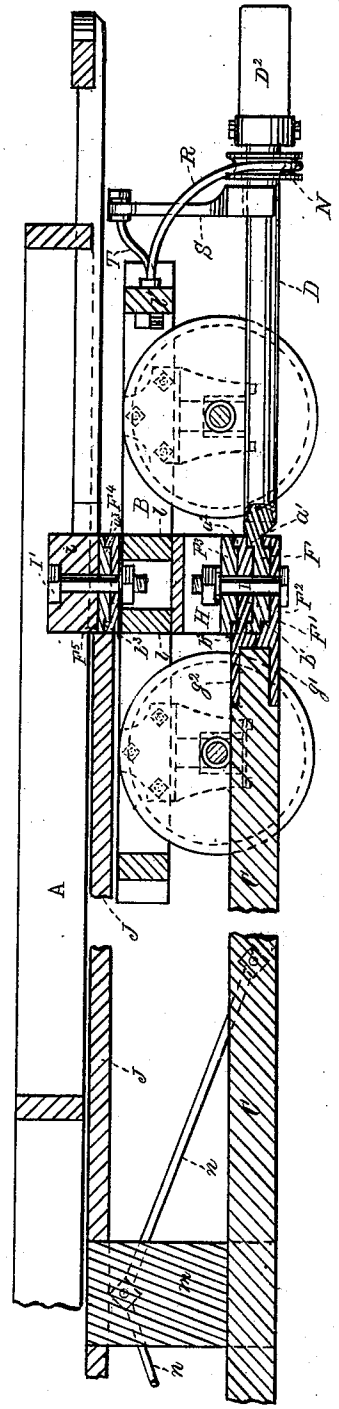


FIG. 2



Witnesses

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2 Sheets—Sheet 2.

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CAR-COUPLING.

No. 178,817. Patented June 13, 1876.

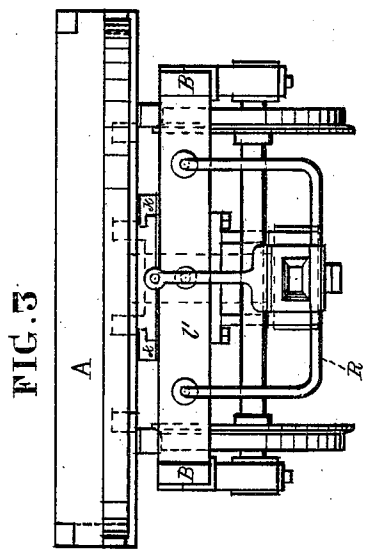

FIG. 5

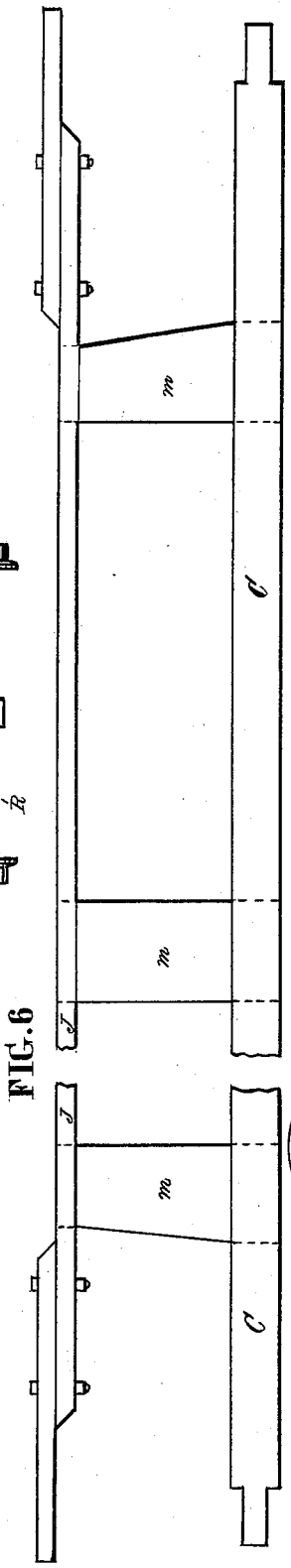

FIG. 6

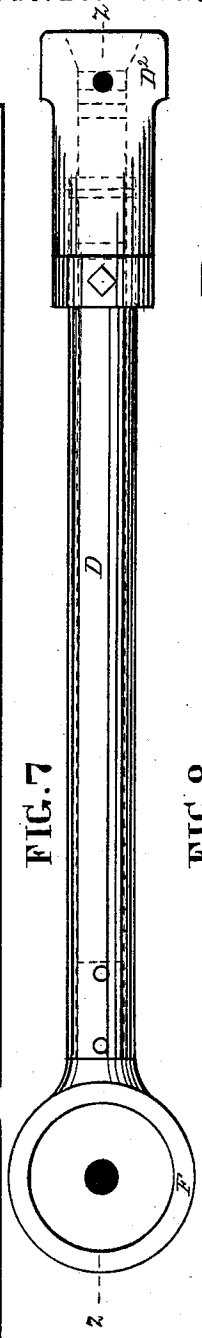

FIG. 7

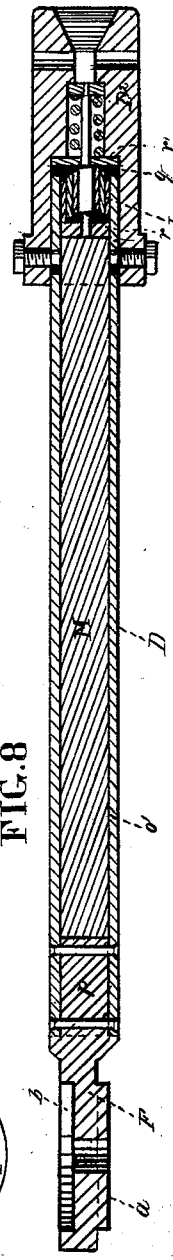

FIG. 8

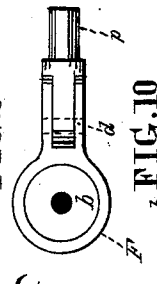

FIG. 9

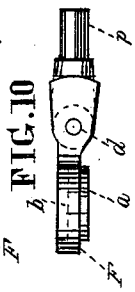

FIG. 10

Witnesses

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UNITED STATES PATENT OFFICE.

STEPHEN USTICK, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN CAR-COUPLINGS.

Specification forming part of Letters Patent No. **178,817**, dated June 13, 1876; application filed November 18, 1875.

To all whom it may concern:

Be it known that I, STEPHEN USTICK, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Car-Couplings, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

This is an improvement on the inventions for which Letters Patent were granted to me on the 8th day of June and the 28th day of September, 1875, respectively, in which the draw-bars of each car have a pivotal connection with a longitudinal beam arranged beneath the truck-frames, a short distance above the rails of the track, and rigidly connected, by means of the frame-work or hangers, to the bottom frame of the car-body, whereby the draw-bars are permitted to oscillate freely on their pivots, at or near the centers of the trucks, to allow the latter to run freely on curved tracks, and thus avoid the immense friction incidental to the usual mode of coupling, in which the draw-bars are rigidly connected to the car-frame; and also, by the draw-bars being thus arranged near the track, to avoid the immense leverage ordinarily exerted upon the rails and the flanges of the truck-wheels when the engine runs off the track, resulting in the cars being thrown upon their sides.

My present invention mainly consists in the combination of such longitudinal beam with the lower sides of the truck-frames—their upper sides having only a lateral connection with the car-body—being free to shift their position in the longitudinal direction of the car, as hereinafter set forth.

The draw-bars are connected by means of swivel-plates with said beam, and consequently all the force exerted in the draft and bumping of the cars is in a horizontal line, from end to end of the train, but a short distance above the horizontal plane of the rails of the track, and hence the liability of the cars being torn from the trucks when the treads of the wheels meet with obstructions on the track, which occurs in the ordinary manner of coupling the swivel-connection of the trucks with the cars, is avoided, and the great destruction to life and property thereby guarded against.

The swivel-plates on the upper sides of the trucks, instead of being made fast to the truck-frames, as in the usual manner of connecting them, are fitted to rabbeted ways of the trucks, whereby the latter are free to move in the longitudinal direction of the car-frame, to compensate for any irregularities of the track.

The invention further consists in the combination of bent rods with the outer ends of the truck-frames for the support of the draw-bars, which are provided with friction-wheels, which rest upon the rods which hold them in their horizontal position and admit of their oscillating freely in the swivel movements of the truck.

The invention also consists in the combination of vertical rods at their upper ends with the outer ends of rods, projected from the truck-frames, upon which they have an oscillatory movement, and with the draw-bars at their lower ends, which are weighted, whereby they are kept in a vertical position when the draw-bars are uncoupled, so that all the draw-bars may at such time be in the vertical plane of their respective trucks, to facilitate their coupling.

The invention further consists in the construction of the outer ends of the draw-heads square or at right angles to the draw-bars, for the purpose of keeping the pairs of draw-bars coupled together in line with each other when the draw-bars bump together.

The draw-heads, being provided with swivel-plates, may be connected with the ordinary swivel-plates which connect the trucks with the car-frames when further alteration in the cars is not desired, and thus accomplish one object of my invention, as hereinafter set forth.

In the accompanying drawings, Figure 1 is a plan view of one end of the bottom frame A of a car, and a truck, B, with my improvements. Fig. 2 is a vertical section at the line *x x* of Fig. 1. Fig. 3, Sheet No. 2, is an end view of the truck B and car-frame A. Fig. 6 is a side elevation of the longitudinal beam C and frame-work, for combining it with the frame A. Fig. 7 is a top view of the draw-bar D, on an enlarged scale, double that of the preceding figures. Fig. 8 is a longitudinal section at the line Z Z of Fig. 7. Fig. 9 is a

top view of the swivel-plate F and the end piece D^1 of a draw-bar connected therewith by means of the horizontal pivot *d*. Fig. 10 is an edge view of the same.

Like letters of reference in all the figures indicate the same parts.

A represents one end of the bottom frame of a car-body, and B a truck connected therewith. C is a longitudinal beam, similar to those shown in my patents above referred to, but connected with the frame A in a different manner, and having swivel-plates on its ends for the connection of the trucks and draw-bars. It is arranged as low as practicable, for the purpose of having the draft and bumping of the draw-bars near the horizontal plane of the rails of the track, and thus to get rid of the immense leverage upon the sides of the rails and flanges of the truck-wheels incidental to the usual mode of coupling when there is any side draft, especially when the engine runs off the track, whereby the cars, in consequence of this leverage, are frequently thrown upon their sides as above stated. The draw-bar D has a swivel-plate, F, on its inner end, which has a central projection, *a*, on its lower side, and a like depression, *b*, in its upper side. With each end of the longitudinal beam C is connected a swivel-plate, F^1, on its lower side, and a like plate, F^2 on its upper side. The former has a concentric depression, b^2, which receives the projection *a* of the swivel-plate F, and the latter a projection, a^1, which fits the depression *b* of said plate F, as seen in Fig. 2. The swivel-plates F^1 and F^2 have flanges g^1 and g^2, respectively, which are sunk in the beam C at its ends, and firmly secured by means of the rivets *h*. The truck-frame B is provided with a casting, H, or other suitable projection, on its under side, which is confined thereto by means of screw-bolts. The swivel-plate F^3 forms the lower side of the casting H. It has a projection, a^2, which fits a corresponding depression, b^2, of the swivel-plate F^2. I is a king-bolt, by means of which all the above-described swivel-plates are confined together; and the draw-bars and trucks, by means of the swivel-plates, have a partial turn on the swivel-plates F^1 and F^2, as they change their positions in relation to the cars when the train runs from a straight track onto a curve, and vice versa, and the longitudinal beam C by the connection is held at its proper height. The car-frame A has a lateral connection with the truck-frames B by means of the swivel-plates F^4 and F^5. The latter are secured by means of screw-bolts to the cross-timbers *i* of the frame A, and the former are held in connection therewith by means of king-bolts I′, the two plates being fitted together by means of the depression b^3 and projection a^3, as seen in Fig. 2. The truck-frames are permitted to slightly vary their position at their upper sides in relation to the frame A, in its longitudinal direction, in accommodation to any irregularities of the track-rails, so as to free the connections of the trucks with the longitudinal beam C of all strain in that direction. This object is accomplished by the connection of the swivel-plates F^4 with the cross-timbers *l l* of the trucks, by means of the rabbeted ways *k k*, as seen in Fig. 3. I make a positive rigid connection of the longitudinal beam C with the frame A in the direction of its length by means of one or more studs or uprights, *m*, the upper ends having rigid stops, against which the uprights bear, but against which they are permitted to slide in the lateral direction of the frame A, in accommodation to irregularity of the road.

The horizontal timber J may be framed on the upper ends of the studs *m* when two or more are used, in which case the timber may run the whole distance between the cross-timbers *i* of the frame A, and its ends butt against them, as shown in Fig. 2, if desired, or the ends may extend to any other convenient points of the frame for connecting them with suitable stops.

In order to have the whole depth of the timber J to bear against the cross-timbers *i*, or the edges of the swivel-plates F^5, the timber may be spliced at its ends in the manner shown in Fig. 6, or it may have suitable irons connected with its ends to accomplish the same purpose. The braces *n* (shown in Figs. 1 and 2) may be used to support the studs *m* at their upper ends, either with or without the use of the timber J. Or any other suitable means may be used to give requisite stiffness to the connection of the beam C with the frame A. The draw-bars D may be constructed in any manner in which the swivel-plates F may be connected with their inner ends.

In the drawings I have represented the main and middle portion constructed of a tube, *o*, with the inner end of which the projection *p* of the swivel-plate is connected and fastened by means of rivets. The outer end of the tube is inserted in the recess *q* of the draw-head D^2, and has within its bore the bumper-spring L situated between the standing-plate *r* and the follower r^1. The bore between the standing-plate and the projection *p* of the swivel-plate F is filled up with the wooden core M, for the purpose of increasing the lateral stiffness of the draw-bar, to increase its power of resistance to the bumping. The outer end of the core serves to support the standing-plate *r*. On the outer end of the draw-bar is placed the friction-wheel N, which rests upon the middle portion of the bent rod R, the ends of which are connected with the end timber *l′* of the truck-frame B, as seen in Figs. 1 and 2. The said middle portion of the rod is concentric with the king-bolt I, for the purpose of keeping the friction-wheel in its longitudinal position on the draw-bar during the oscillations of the latter. The height of the draw-bar may be readily adjusted at its outer end to correspond to the height of any other one with which it may be coupled, by having differential diameters to the friction-wheel N, and connecting one end of the piece

D′ (seen in Figs. 3 and 4) with the swivel-plate F by means of the horizontal joint-pin *d*, whereby the draw-bar may have a vertical oscillation necessary to the varied heights of the draw-heads A. A similar joint in the draw-bars is shown in my patent of September 28, 1875. This joint will, however, be unnecessary if the swivel-plates of all the trucks are of equal height, or nearly so. S is a vertical bar, the upper end of which is fitted to swing on the outer end of the rod T, the inner end of which is connected with the end timber *l′* of the truck-frame, as shown in Figs. 1 and 2. The lower end of the bar is bifurcated, and straddles the draw-bar D, and is made of sufficient weight to always incline the bar to a vertical position, to bring or keep the draw-bar when uncoupled in line with the central vertical plane of the truck, as seen in Fig. 3, to facilitate its coupling.

For the purpose of keeping the pairs of draw-bars, which are coupled together, in line during the bumping of the same, to insure a positive and firm resistance to the bumping, I make the outer ends of the draw-heads D^2 flat horizontally, and at right angles to their draw-bars, as shown in Figs. 1 and 7. They may be slightly convex vertically, so as to butt fairly against each other, even should they not be in line horizontally. When the ordinary beam C would be in the way of any devices arranged beneath the truck-frames, I contemplate using two beams parallel with each other, of a suitable distance apart, the swivel-plates F^1 and F^2 being connected therewith in any convenient manner.

The cars having my improved draw-bars arranged beneath the truck-frames should have additional draw-heads or link-sockets, at the ordinary height, to provide for coupling said cars, when required, with a train of cars having the ordinary draw-bars.

I claim as my invention—

1. The longitudinal beam C, having the swivel-plates F^2 at its ends, in combination with the truck-frames B, having swivel-plates F^3 centrally arranged with their under sides, and held in connection with the said swivel-plates F^2 by means of king-bolts I, substantially in the manner and for the purpose set forth.

2. The combination of the swivel-plates F^4 and F^5 and king-bolts I′ with the car-frame A and truck-frames B, having rabbeted ways *k k*, whereby the trucks have a positive lateral connection with the car-frame, but are free to move at their upper sides in the longitudinal direction thereof, substantially in the manner and for the purpose set forth.

3. The combination of the longitudinal beam C, having one or more uprights, *m*, with the frame A, with which the upper end of the said upright or uprights have a positive connection in the longitudinal direction of the frame, but are free to move in lateral direction, substantially in the manner described and for the purpose set forth.

4. The draw-bars D, having swivel-plates F on their inner ends, in combination with the longitudinal beam C, having swivel-plates F^1 and F^2, substantially in the manner and for the purpose set forth.

5. The combination of the bent rod R with the truck-frame B and draw-bar D, for supporting the latter, substantially as set forth.

6. The combination of the weighted bar S, draw-bar D, supporting-rod T, and truck-frame B, substantially as and for the purpose set forth.

7. The oscillating draw-bar D, having a draw-head with the butting end, flat and at right angles to the draw-bar, substantially in the manner and for the purpose set forth.

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Witnesses:

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GEO. C. HETZEL.