T. C. LORD.

CAR-COUPLINGS.

No. 194,779. Patented Sept. 4, 1877.

Fig. 1.

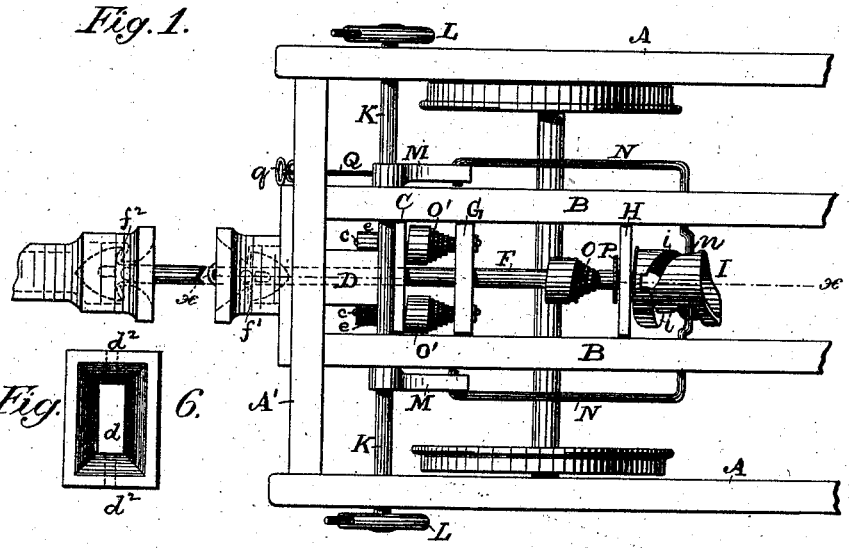


Fig. 6.

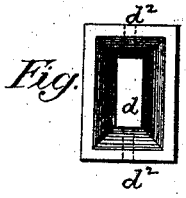
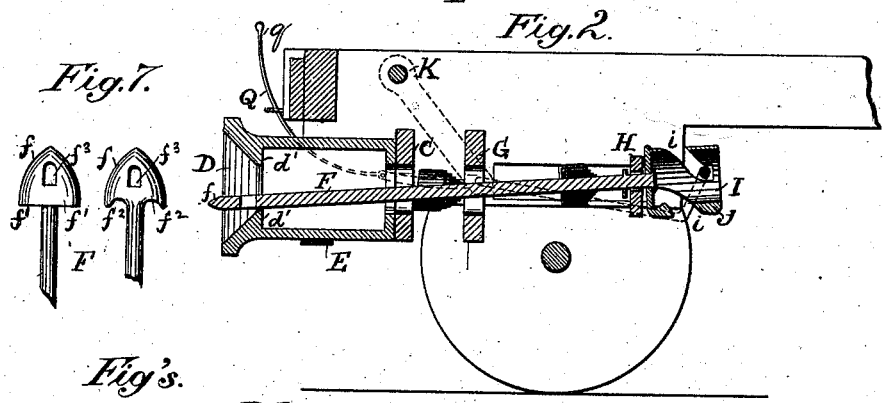
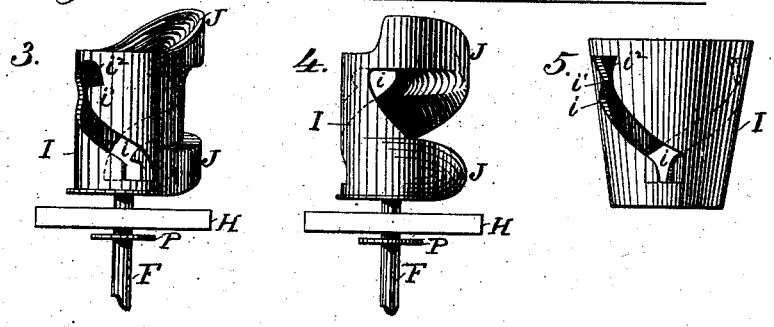


Fig. 2.

Fig. 7.



Fig's.



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UNITED STATES PATENT OFFICE.

TYLER C. LORD, OF JOLIET, ILLINOIS.

IMPROVEMENT IN CAR-COUPLINGS.

Specification forming part of Letters Patent No. **194,779**, dated September 4, 1877; application filed October 5, 1876.

To all whom it may concern:

Be it known that I, TYLER C. LORD, of Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Car-Couplings; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to railroad-car couplings and buffers; and the invention consists in certain new and improved devices and combinations of devices, operating as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is plan view of one end of a railroad-car body provided with my improved coupling and buffer devices. Fig. 2 is a vertical sectional view of the same on the line *x x*, Fig. 1. Figs. 3 and 4 are detached and enlarged views of the device for turning the draw-bar into position for coupling and uncoupling the car. Fig. 5 is a similar view, showing a turning device of a modified form. Fig. 6 is a front elevation of one of the draw-heads; and Fig. 7 shows differently-formed draw-bar heads.

Referring to the parts by letters, A A represent the sills or outer beams of the frame of a car-body; A′, the end cross-beam; and B B two longitudinal beams, arranged parallel to and between the sills A. C is a short cross-beam or follower, arranged between the beams B B. D represents one of the draw-heads, arranged centrally at the end of the car and between the beams B B. It is retained in position and rests upon a stirrup, E, but is left free to move both vertically and laterally, and thereby conform or adapt itself to the vibration and oscillation of the car as it passes over the rails. F represents one of the draw-bars. Its outer or projecting end is formed into a dart or spear shaped head, *f*, having shoulders f^1, by means of which the coupling of the cars is effected, in the manner hereinafter more fully set forth.

The shoulders of the head *f* may be of angular form, as shown at f^1, or curved, as shown at f^2, Figs. 1 and 7 of the drawings; or they may be made of any form suitable for catching onto and holding against that portion of the draw-head with which they are brought into contact, to couple the cars.

The heads *f* of the draw-bars are also perforated with an oblong or suitably-shaped hole, f^3, for the purpose of receiving an ordinary coupling-pin, should occasion arise for coupling the cars in that manner, an occurrence which might happen if a car having my improved device had to be coupled to another which was provided with an ordinary link-and-pin coupling.

The stem or shaft of the draw-bar F extends rearwardly through the draw-head D, and through the followers C, G, and H, all of which are formed with a central slot or hole of sufficient diameter to permit of the draw-bar playing or moving laterally and vertically, or in any direction which the oscillation and vibration of the car may impart to it. These followers C, G, and H are arranged transversely between the beams B B, and, if found desirable, their ends may be tenoned and inserted in grooves formed in the sides of beams B B, said grooves in such case acting as guides for the followers as they reciprocate or move back and forth between the beams B, as hereinafter set forth.

The rear end of the draw-bar F is bolted or keyed, or otherwise rigidly secured, to a hollow cylindrical or cone-shaped plate, I, made of any suitable material, the walls of which are cut or formed with spiral or cam-shaped slots *i*, the ends of which slots are provided with shoulders i^1 and recesses i^2. One side of the plate I is made heavier than the other, or provided with weights J, so that its tendency will be to remain in one position through the effect of gravity.

K represents a rock-shaft, which is journaled to and extends across the car-body, its ends projecting slightly beyond the sills. L L are windlasses or levers, keyed to the ends of the shaft K, and provided with handles convenient for operation. M M are crank-arms, which are also keyed at one end to the shaft K, their other ends being slotted or otherwise formed to receive the ends of a crank-rod, N, which is pivoted to the arms M. The middle or crank portion *n* of this rod N

is passed through the slots *i* in the hollow plate I, as clearly shown in Fig. 1 of the drawings, its ends being pivoted or hinged to the cranks M. O represents a volute or spiral spring, placed loosely around the stem of the draw-bar F, between the followers G and H. P is a disk or bearing-plate, rigidly keyed or secured to said stem of the draw-bar at a point between the follower H and the spring O. O′ O′ are two springs, of similar construction to the spring O, arranged parallel to each other, one on each side of the draw-bar, and between the followers C and G. They are held in position by means of rods *c c*, which pass through their centers, the rear ends of said rods sliding in the follower G, passing through the follower C, and into plates *e e*, to which they are secured, the plates being themselves secured to or forming a part of the draw-head D.

The connection of the draw-head and followers C G by these rods *c*, and the arrangement of the springs O′ upon the rods, serve to give a very steady and even buffer resistance, and obviates the necessity of having the ends of the followers sliding in grooves in the bars B, the rods being of themselves sufficient to hold the parts in their relative position.

The arrangement of two springs, O′, one on each side of the draw-bar, instead of the springs being upon the draw-bar itself or placed around it, removes all shock or strain from the draw-bar as the cars come together, all the strain being borne by the draw-head D, the followers C and G, and springs O′; and through the use of the two springs the strain is divided over a greater bearing-surface, greater resisting-force being thus obtained without increasing the risk of breakage.

Q is a lever or bent rod, one end of which is pivoted to a lever connected to a crank, M, and the other extended upward through a suitable guide or staple secured to the end of the car-frame, said bent rod being provided with a handle, *q*, for convenience of operation on the top of the car.

The interior of the draw-head D is made hollow, and its external opening is in the usual flaring-mouthed form, the flaring sides of the mouth leading to an elongated vertical slot, *d*. These inner sides of the flaring walls of the mouth form shoulders d^1, which may be angular or of curved form, or of any form corresponding to the form of the head of the draw-bar, such as shown by Figs. 1 and 7 of the drawing.

The draw-head may also be provided with a vertical bolt-hole, d^2, for the insertion or reception of an ordinary coupling-pin, when such is required to be used.

The operation of the improved devices is as follows: The cars are provided with the devices, hereinbefore described, at each end, the draw-bars, when not in use, remaining in position shown by Figs. 1 and 2 of the drawings. In this position, as will be evident to those skilled in the art, when the cars come together the "thrust," consequent upon any forcible contact between them, will be borne by the springs O′ O′, the draw-head operating as a buffer in the center of the car, and forcing said springs against the follower G, which is prevented by stops from moving farther to the rear or inwardly between the beams B.

In this manner the draw-head operates as a spring-buffer without in any way affecting the draw-bar and its operating mechanism, thereby obviating the necessity for the use of separate buffers arranged on either side or above or below the draw-head, the draw-head in this instance operating in the double capacity of buffer and draw-head. It will also be obvious that, by this arrangement, the cars may come together without becoming coupled.

When it is desired to couple the cars the draw-bar F of one of the cars to be coupled is thrown forward, and at the same time turned so as to bring its head with the shoulders f^1 into the same vertical plane as the elongated vertical slot *d* of the draw-head of the other car to be coupled.

This operation is accomplished as follows: The rock-shaft K is turned by means of either of the levers L or Q, the turning of the shaft moving the arms M and crank-rod N, and thereby causing the draw-bar F to turn through the working of the crank *n* in the spiral slots *i* of the turning device I. When turned into this position the head of the draw-bar will easily pass in through the opening *d* in the draw-head of the adjacent car. By releasing the pressure on the lever which turns the shaft K, the weight J on the turning device I will again turn the draw-bar into its former position, and the shoulders f^1 on its head will then extend beyond the opening *d*, so as to prevent its withdrawal, thereby coupling the cars and locking the coupling devices so that they cannot become uncoupled until operated upon. Or the same result may be accomplished by the operator reversing the motion of the lever which turns the rock-shaft K, so that it is not essential that the turning device I should be weighted on one side, as described, though I prefer that it should be so constructed.

This turning device may also be made in different forms, two of which I have shown by the drawings. The conically-shaped one is intended to occupy the entire width of the crank *n*, and thereby furnish a larger bearing-surface between the edges of the slots *i* and the operating-rod N.

I also propose to increase the bearing-surface by turning the metal in or out, or by widening the edge or lips of the slots at their point of contact with the operating-rod.

It will also be obvious to those skilled in the art that the turning device may be so constructed as to turn the draw-bar without itself having to turn. For instance, if we suppose the turning device to be rigidly connected with the levers which operate the same, or so

as to have a reciprocating or back-and-forth movement only, the turning of the draw-bar might be effected by a pin or projection on its end working in a spiral groove or slot formed in the turning device.

Such being the case, I do not wish to confine myself strictly to the exact turning device which I have herein shown and described. Any of the well-known devices for converting a reciprocating into a rotary motion may be used, as found most desirable or convenient.

When the cars are coupled by one of the draw-bars F, as described, they may, if desired, be doubly coupled by pushing forward the draw-bar of the other car, and then turning it in the same way as first described—an arrangement that will be found desirable and very useful on heavy freight-trains.

It will also be obvious that the coupling may be effected between cars of unequal heights, or having their draw-bars arranged at different heights, as the head of the draw-bar will pass through the opening *d* at any point thereof, and, turning after it has entered, will engage its shoulders with the draw-head, whether at the top or bottom of said opening, or at any point between its upper and lower ends.

In case of accident, as by one car leaving the track and turning on its side, the draw-bar will, of course, be turned so that its head will pass out of the opening *d*, and the cars will uncouple automatically, thereby preventing the overturned car from dragging the others from the track.

When the train is in motion the draw-bar will be drawn forward, thereby bringing the spring O up against the follower G, and the springs O′ will bear against the follower C, whose motion in a forward direction is limited by stops. In this way it will be seen that the drag or forward pressure is borne by the three springs O′, O′, and O, while the thrust or backward pressure comes upon the springs O′ O′ alone. This arrangement is very desirable, and will be found to be best suited to the necessities of railroad transportation.

A further advantage accruing from the use of my improved coupling device is, that the cars may be coupled or uncoupled without danger to the operator, both while the cars are at rest and in motion, as it is not necessary to get between the cars either to couple or uncouple them, the operation being performed, as I have shown, either at the sides or on top of the car; and, as will be evident, it may be performed from the interior of the car through suitable connections with the shaft K.

Again, the draw-heads being free to move upon their supporting-stirrups laterally as well as vertically, it will be evident that the coupling of the cars may be effected on a curve of the track as easily as on a straight portion thereof; and the cars may also be coupled or uncoupled when the draw-heads are in close contact, or when the draw-bars are extended.

All links, pins, hooks, and chains are dispensed with, and yet, should occasion require, cars provided with my apparatus may be coupled with the ordinary coupling-pin, and with or without the ordinary coupling-link.

I am aware that buffer-springs arranged so as to encircle the draw-bar have before been used, and do not therefore wish to be understood as claiming such as my invention.

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

1. The headed draw-bar F, arranged to operate in combination with draw-head D, having slot or opening *d*, by means of a turning device, I, operating to turn the draw-bar, substantially as and for the purpose specified.

2. The turning device I, having spiral slots or grooves *i*, operating, in combination with a rod, N, and rock-shaft K, for the purpose of turning the draw-bar F, and thereby effect the coupling and uncoupling of railroad-cars, substantially as specified.

3. The turning device I, having weighted side J and spiral grooves or slots *i*, operating in combination with the crank-rod N, rock-shaft K, and draw-bar F, substantially as and for the purpose specified.

4. The combination of draw-head D, draw-bar F, turning device I, rod N, and rock-shaft K with the windlasses or levers L and Q, arranged for operation on the sides or top of the car, substantially as specified.

5. In combination with the draw-head D, having plates *e*, and followers C and G, connected by means of the rods *c*, springs O′ O′, operating substantially as and for the purpose specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

TYLER C. LORD.

Witnesses:
D. G. STUART,
A. MCCALLUM.