C. M. CARNAHAN.

Car-Coupling.

No. 211,133. Patented Jan. 7, 1879.

Fig. 1.

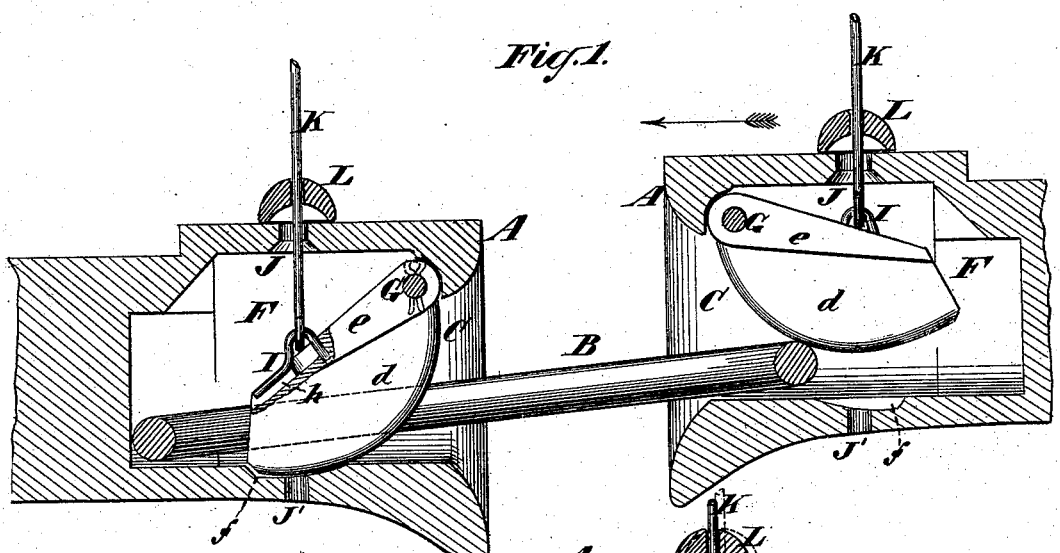


Fig. 2.

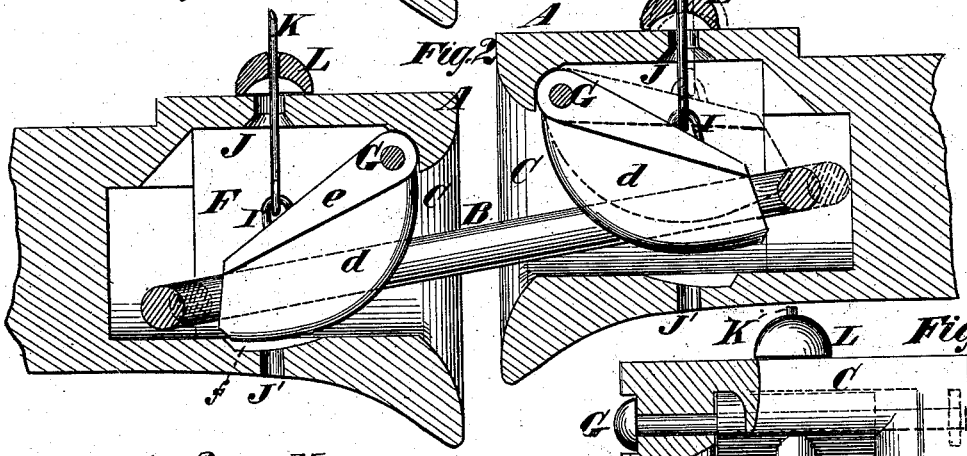


Fig. 3.

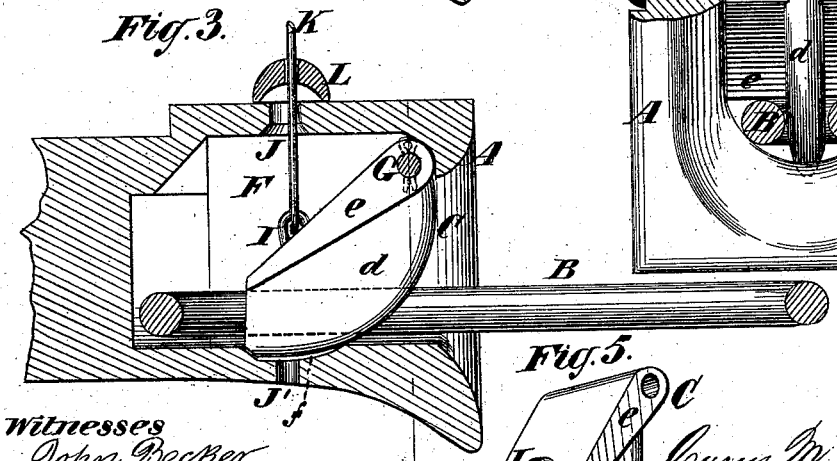


Fig. 4.

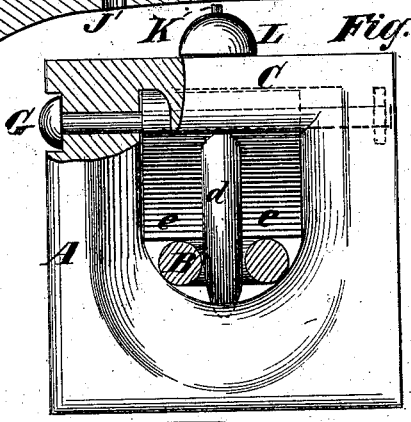
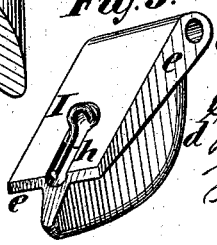


Fig. 5.



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UNITED STATES PATENT OFFICE.

CYRUS M. CARNAHAN, OF SANDY LAKE, PENNSYLVANIA.

IMPROVEMENT IN CAR-COUPLINGS.

Specification forming part of Letters Patent No. **211,133**, dated January 7, 1879; application filed March 4, 1878.

To all whom it may concern:

Be it known that I, CYRUS M. CARNAHAN, of Sandy Lake, in the county of Mercer and the State of Pennsylvania, have invented an Improvement in Car-Couplings; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to that class of car-couplings which employ links, but which, instead of using a pin for insertion through the draw-head or buffer-head and through the link for coupling cars, employ, instead of such pin, a self-locking pawl placed in the draw-head or buffer-head for automatically engaging the link when the said link is inserted in the said draw-head or buffer-head.

The invention consists in the combination, with a draw-head or buffer-head, constructed substantially as hereinafter set forth, of a pawl of novel construction—to wit, a pawl having a downwardly-projecting middle part, which passes through the link to fasten the same in the draw-head, and two wings, one on each side of said downwardly-projecting part, said wings being conterminous with the said central part, and having their under sides plane, or approximately plane, surfaces inclined downwardly toward the inner part of the draw-head and at an angle with the longitudinal axis of the draw-head, substantially as hereinafter described.

Figures 1 and 2 are, respectively, longitudinal sections of a coupling constructed in accordance with my invention, Fig. 1 showing the link as fastened in one draw-head and entering another draw-head to be coupled, and Fig. 2 showing the link fastened in both draw-heads. Fig. 3 is a longitudinal section of one part of said coupling, with the parts arranged as when the car to which it is attached approaches another car to be coupled thereto. Fig. 4 is an end view of a draw-head or buffer-head, an end view of the pawl, a sectional view of the link arranged in the position shown in Fig. 3, and a view of a portion of the pin which attaches the pawl to the interior of the said draw-head or buffer-head, a portion of the said head being broken out to better show the said pin and its relation to the said pawl and head. Fig. 5 is a perspective view of the pawl.

A represents draw-heads belonging to adjacent cars in Figs. 1 and 2, and a single draw-head in Figs. 3 and 4. B represents the link, and C the pawl, attached to and fitted into the draw-head or buffer-head, as hereinafter described. The said pawl is formed of a downwardly-projecting part, *d*, and two wings, *e*, projecting laterally from the upper part of the said central part and conterminous with the said central part. The said central part and the wings are preferably formed in a single piece, and in the form hereinafter described.

I am well aware that pawls have been used in couplings having a downwardly-projecting part for the engagement of the link and laterally-projecting wings for holding the link in some position supposed to be specially advantageous by the inventors of the said couplings; but, so far as I am aware, none of the said couplings have ever realized all the requisites of a good self-locking car-coupling designed to use only the ordinary straight or bent links, which requisites I will, as a preliminary to the further description of my invention, proceed to specify.

It is necessary, to fulfill all the requisites of a good coupling, that the cars on coming together shall easily and certainly couple in all the positions the cars are liable to assume in a loaded or unloaded state on a perfectly level or on an uneven permanent way, using only the common straight link, or for cars of very different heights the common bent link. The cars should couple without any undue stress upon the link that shall tend to bend or to break said link, whether the link be the ordinary straight link or the ordinary bent link used for cars of different heights. It is also necessary that the link used shall be as short as will permit the insertion and fastening of the same in the draw-head when the cars come together for coupling, as the shorter the link can be made the longer will it last under service.

In order that the link shall enter certainly and easily into a draw-head, which it is desired to couple to that draw-head which carries the link, it is essential, in a good coup-

ling, that the link be supported in a position parallel, or substantially so, with the longitudinal axis of the draw-head which carries it at all times when the said draw-head is not coupled to any other draw-head. This proper and essential position of the link is illustrated in Fig. 3 of the drawing; but it is also necessary that the said link, while supported in the said position shown in Fig. 3, shall be free to let its outer end move up or down with very slight exertion of force when the said outer end comes in contact with any other draw-head for coupling the two draw-heads together, in order that the said link may adjust itself to enter the said draw-head without undue strain in coupling.

In couplings of this class, as heretofore constructed, some of these conditions have been attained, and some of them have, notwithstanding their defects, been adopted in practice. Some of them when uncoupled have held the link in the proper position for coupling, but have not permitted the free inclination of the link upward in coupling to a higher draw-head. Others have not permitted the free downward inclination of the link when the same is required in coupling to a lower draw-head. Still others have permitted the free downward movement of the link in coupling, but have failed to secure the proper position for coupling when the same were uncoupled. Others, again, by the peculiarities of their construction, require that the pawl shall be swung through so long an arc to disengage it from the link that the link itself has to be made longer than the standard link used ordinarily with the coupling-pin for coupling cars in ordinary railway practice. This permits too much play between the cars, and consequently the links are badly strained by the concussions in starting trains. Some couplings of this class, moreover, have their pawls and the links held (by faults in the construction of the parts of the couplings) in such a position that when the draw-head that carries the link has to be uncoupled from a draw-head that stands considerably higher, the hook-like form and action of the pawl will not disengage the link in its upwardly-inclined position, and the uncoupling can only be performed with difficulty in the said position of the parts, if, indeed, it can be performed at all, which is frequently impossible without changing the relation of height between the cars.

In the coupling which forms the subject of my present application I have avoided all the above-named defects by the peculiar construction of the pawl C and its arrangement in the draw-head, as hereinafter described.

The peculiarity of the pawl lies chiefly in the novel construction and arrangement of the wings *e* in relation to the central part, *d*, of the said pawl and to the longitudinal axis of the draw-head. The said wings project far enough laterally from the central part, *d*, to rest on the link, as shown in the drawing, more particularly in Fig. 4, and they are coterminous with the said central part, as shown in all the figures. The weight of the said pawl is sufficient to balance the weight of the part of the link that projects from the draw-head, as shown in Fig. 3, but not to hold the link with such force as to resist its free movement upward and downward in coupling to a higher or lower draw-head. The under sides of the said wings are plane, or approximately plane, surfaces, inclined downward and rearward toward the longitudinal axis of the draw-head, (meaning by "rearward" the direction toward that part of the draw-bar which lies under the body of the car.) This construction of the said wings with plane inclined under surfaces having the said relation with the longitudinal axis of the draw-head secure the following advantages:

In no possible position of the link, whether its outer end be inclined upwardly or downwardly in the draw-head that carries it, can any but the rearward portions of the said wings rests upon the said link before it attains its maximum upward inclination. This permits the freest play of the link up or down without disturbing the position of the pawl when the link is inclined upward relatively to the draw-head which carries it.

In couplings wherein the wings have their under sides convex and the central part of the pawl is a hook, the wings extending farther back than the central part, the wings form a fulcrum upon which the link acts to bend the link when the end not engaged with the said pawl is forced upward or downward. On the other hand, when the under sides of the said wings are planes, but arranged parallel to the axis of the draw-head, the said wings, bearing upon the link at a point in a straight line between the pin which pivots the pawl in the draw-head and the said link, permit no upward inclination of the link without bending the said link. Also, when curved shoulders or wings are used on each side of the central part of the pawl, and extending rearward back of the central part of the pawl which enters the link, the said shoulders may hold the link in the proper position when uncoupled; but the said link will be held so firmly that free downward inclination of the free end of the link cannot take place, for if the said shoulders be high enough to permit the outer end of the link to incline downwardly, the said end must remain downwardly inclined—a very objectionable position, in which it is very likely to be broken in attempting to couple it with a draw-head higher than the draw-head that supports the said link.

In the pawl employed in my invention, only the extreme rear ends of the wings *e* ever rest on the said link, and therefore all the resistance to the downward inclination of the outer end of the link is the weight of the pawl; and the chief resistance to the upward inclination of the said outer end is the weight of the link itself. Links of the ordinary standard length can be used, and no departure from ordinary

and standard approved railway practice is required except in the construction of the draw-head and pawl, as herein described.

The pawl is fitted into a recess, F, in the draw-head, the upper front part of the said pawl being rounded off to fit a corresponding bearing in the draw-head and prevent the pin G, which pivots the pawl in and to the draw-head, from being unduly strained. The forward portion of the central part, *d*, of the said pawl is also beveled or rounded off to facilitate the entrance of the link under the said pawl into the said draw-head. In coupling, the rear extremity of the said central part, *d*, is, in its normal position, almost vertical to the longitudinal axis of the draw-head, as shown in Fig. 4. In raising the said pawl for uncoupling cars there can be no hook-like action of the said pawl on the said link that can engage the link and prevent the ready uncoupling of the same. The rear end of the said pawl rises almost vertically in uncoupling, and it only has to be raised a trifle more than the thickness of the link to permit the disengagement of the link, as shown in Fig. 1, at the right hand in said figure. In the lower part of the draw-head is formed a small supplementary recess, *f*, for the reception of a small portion of the central part, *d*, of the pawl. On the back side of the said pawl is formed a groove or recess, *h*, Figs. 1 and 5, in which is placed longitudinally and attached to the pawl a hook-bar, I. Through the upper part of the draw-head is formed a hole, J, for the passage of a rod, K, having an eye at its lower extremity, which slips on the said hook-bar, as shown in Fig. 1. The said rod extends upward to some convenient place for operating the same for raising the pawl in uncoupling cars when coupled together.

Closely fitted to the said rod, and covering the hole J, is a shield, L, which prevents dirt from getting through the said hole, and also protects the interior parts of the coupling from the weather. Directly below the hole J is another hole, J′. When the pawl is removed, by inserting a common coupling-pin through the holes J J′ the draw-head may be coupled to another draw-head in the ordinary manner.

I thus secure a coupling that will couple and lock automatically in any and all positions possible for the draw-heads to approach each other to be coupled, in which only the ordinary standard links are required, and which, while it will never spontaneously uncouple, is easily uncoupled when the cars are brought together in any position possible for the draw-heads to occupy by virtue of difference of load or unevenness of the track upon which the cars stand.

I claim—

The combination, with a draw-head, of a pivoted pawl having a downwardly-projecting part, *d*, for entering into and engaging the link, and wings *e*, conterminous with the said central part, projecting laterally from the upper portion of the said central part, and having their under surfaces (planes, or approximate planes) inclined downward and rearward toward the longitudinal axis of the draw-head, whereby only the rearward extremities of the said wings bear upon the link in any position of the link between the maximum downward inclination and the maximum upward inclination of the outer end of the link, substantially as and for the purpose specified.

This specification signed this 1st day of March, 1878.

CYRUS M. CARNAHAN.

Witnesses:

F. BARRITT,

CH. RIEGELMAN.