

(No Model.)

W. F. RICHARDS.
CAR COUPLING.

No. 574,575.

Patented Jan. 5, 1897.

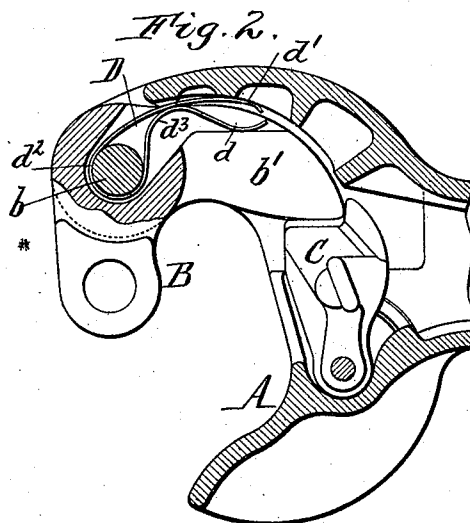
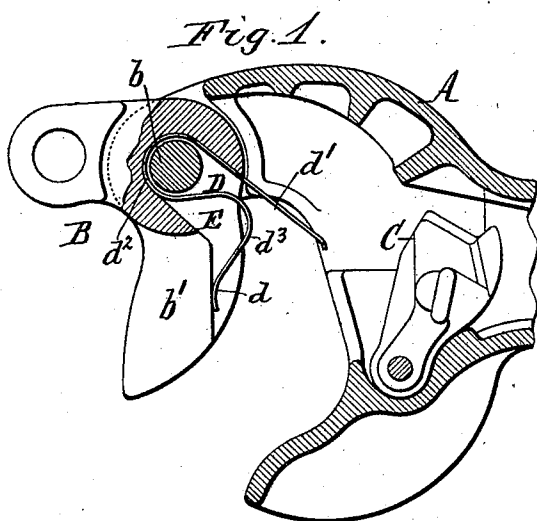
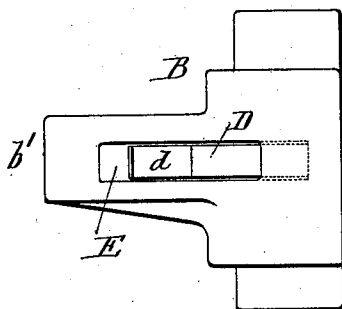


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

WILLARD F. RICHARDS, OF BUFFALO, NEW YORK, ASSIGNOR TO THE
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CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 574,575, dated January 5, 1897.

Application filed June 16, 1896. Serial No. 595,720. (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-Couplings, of which the following is a specification.

This invention relates to that class of twin-jaw car-couplings which comprise a horizontally-swinging knuckle or coupling-jaw, a lock for retaining the knuckle in its closed or coupled position, and an ejecting-spring, whereby the knuckle is automatically thrown into its open position when unlocked. Among other knuckle-opening springs a spring having two straight arms or branches, one bearing against the draw-head and the other against the locking-arm of the knuckle, has been employed. Such a spring, in order to possess the necessary stiffness to fully open the knuckle, must be comparatively heavy, and when so made the same is liable to become set, while its great resistance renders it difficult to close the knuckle by hand.

The object of my invention is to provide an opening-spring of this character which, while being sufficiently powerful to freely open the knuckle, has the requisite resilience or lightness to avoid its becoming set and to permit the knuckle to be closed without difficulty.

In the accompanying drawings, Figure 1 is a horizontal section of a car-coupling provided with my improved knuckle-opener, showing the knuckle open. Fig. 2 is a similar view showing the knuckle closed. Fig. 3 is a detached rear view of the knuckle, showing the recess thereof and the opening-spring seated therein.

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

A is the draw-head, which may be of the ordinary construction, B the knuckle or coupling-jaw, pivoted to the draw-head by the usual vertical pin *b*, and C the lock, which may be of any common construction.

D is the knuckle-opening spring arranged within the draw-head between the tail or locking-arm *b'* of the knuckle and the opposing inner wall of the draw-head. This spring comprises two arms or branches *d* and *d'* and is

preferably formed of a single strip of spring metal, which is loosely bent or doubled around the front side of the knuckle-pivot *b*. The knuckle is provided in its rear side with a central recess E, in which the doubled portion and the inner branch *d* of the spring is seated. The outer branch *d'* is substantially straight and bears at its free end against the adjacent wall of the draw-head, while the inner branch *d* bears at its end against the rear side of the locking-arm of the knuckle and is provided between its free end and the bend *d''* of the spring with an outward bulge *d'''*, which faces the inner side of the outer branch and forms a secondary or auxiliary spring of substantially semielliptical form.

In the open position of the knuckle both branches of the spring are relaxed, as shown in Fig. 1. When the knuckle is closed by contact with an opposing coupling or by hand, the outer branch bears against the inner wall of the draw-head and the inner bulged branch *d* of the spring approaches the outer branch, thus straining or deflecting the latter. During the final portion of this closing movement and before the knuckle is fully closed the bulge or auxiliary spring *d'''* comes in contact with the straight branch, as shown in Fig. 2, causing the auxiliary spring to be strained or partly flattened and correspondingly increasing the aggregate resistance of the spring, and as soon as the resistance of the bulge or auxiliary spring exceeds the resistance of the straight branch the extent of flexion of said straight branch is reduced to the distance between the free end of the spring and the crown of the auxiliary spring, thus still further tensioning the same and adding this increased resistance to that of the strained auxiliary spring and rendering the entire spring practically equivalent to a heavier spring having no such bulge. By this construction the outer straight branch acts as a light primary spring and the inner branch as a secondary spring which comes into action after the primary spring has been strained.

Upon releasing or unlocking the knuckle the strained branches of the spring react and swing the knuckle into its open position, as

shown in Fig. 1. As both members of the spring are under tension in the closed position of the knuckle the initial force of the spring is comparatively great and promptly
 5 overcomes the inertia of the knuckle, and although the power of the spring decreases to the force of its straight branch alone during the remaining movement of the knuckle this reduced force is sufficient to continue the
 10 opening movement and completely and reliably open the knuckle. This construction permits the use of a much lighter and correspondingly resilient spring than could be employed if both arms of the spring were
 15 straight, as heretofore constructed, thus rendering the spring less liable to become set. This construction also enables the knuckle to be closed more easily than by the use of such a heavy spring, because during the first
 20 portion of the closing movement of the knuckle only the comparatively small resistance of the straight outer branch is encountered, and during the last portion of such closing movement the momentum of the
 25 knuckle materially aids in overcoming the increased resistance offered by the bulge or auxiliary spring. My improved spring thus combines the resilience of a light spring with the power of a heavy spring and at the
 30 same time avoids the disadvantages of a two-armed heavy spring having no such bulge or auxiliary spring.

By doubling the spring loosely around the knuckle-pivot, as shown, the same is free to
 35 slide bodily around the pivot to a limited extent, and the entire spring is allowed to yield more or less when its straight branch is

strained, thus increasing the elasticity of the spring.

I claim as my invention—

1. The combination with the draw-head, the knuckle or coupling-jaw and a lock, of a knuckle-opening device interposed between the draw-head and the back of the knuckle and comprising a light primary spring bearing against one of said parts and a secondary auxiliary spring acting upon the other part and arranged to come into action after the primary spring has been strained, substantially as set forth.

2. The combination with the draw-head, the knuckle or coupling-jaw and a lock, of a knuckle-opening spring consisting of a branch bearing against the draw-head and a branch bearing against the knuckle and having a bulge or auxiliary spring, substantially as set forth.

3. The combination with the draw-head, the knuckle or coupling-jaw and a lock, of a knuckle-opening spring consisting of an elastic strip extending around the knuckle-pivot and having an outer branch bearing at its free end against the draw-head and an inner branch bearing at its free end against the knuckle and provided with an outward bulge forming an auxiliary spring which is adapted to bear against said outer branch, substantially as set forth.

Witness my hand this 29th day of May, 1896.

WILLARD F. RICHARDS.

Witnesses:

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 KATHRYN ELMORE.