(No Model.) 3 Sheets—Sheet 1.

W. F. RICHARDS.

CAR COUPLING.

No. 491,134. Patented Feb. 7, 1893.

Fig. 1.

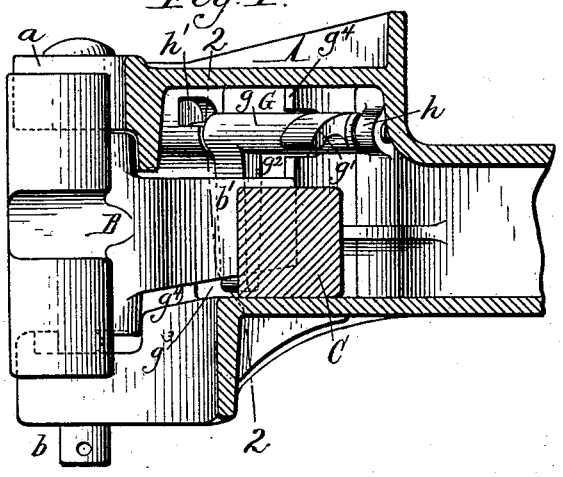


Fig. 2.

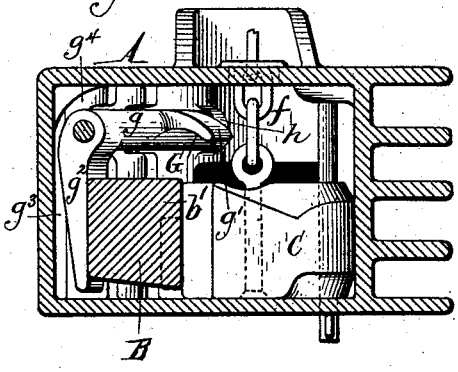
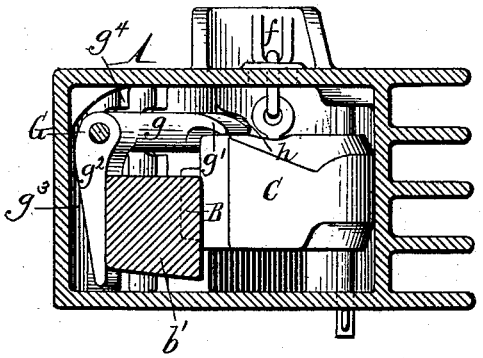


Fig. 3.



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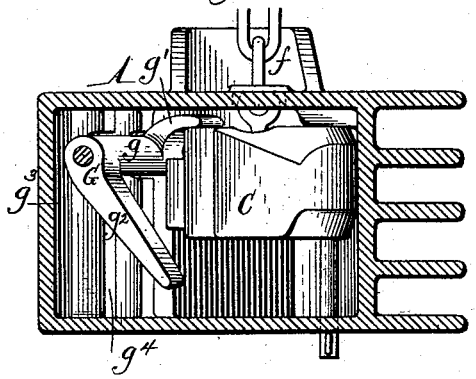

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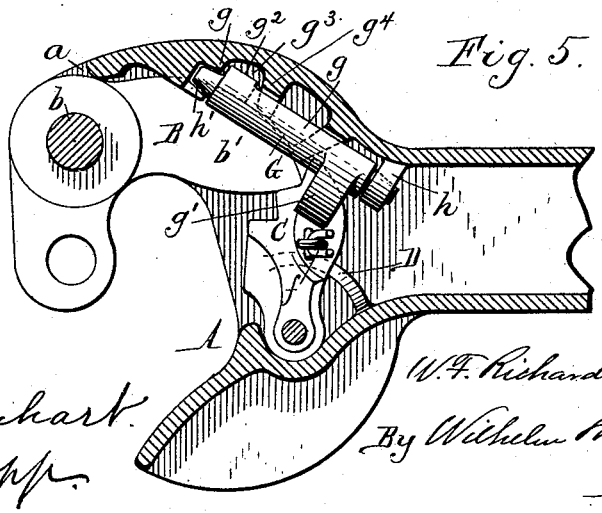

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W. F. RICHARDS.

CAR COUPLING.

No. 491,134. Patented Feb. 7, 1893.

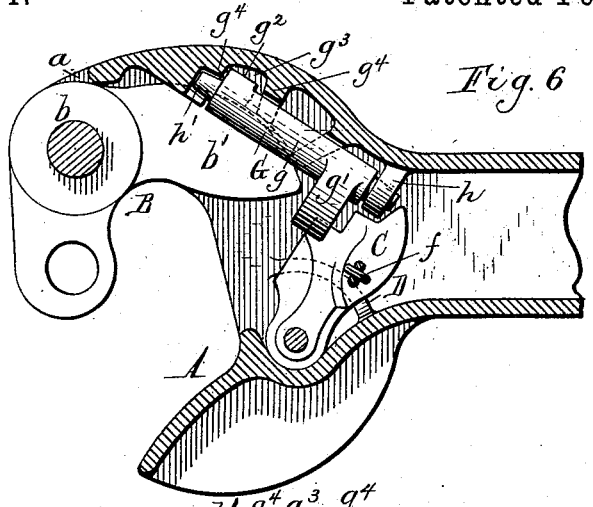


Fig. 6

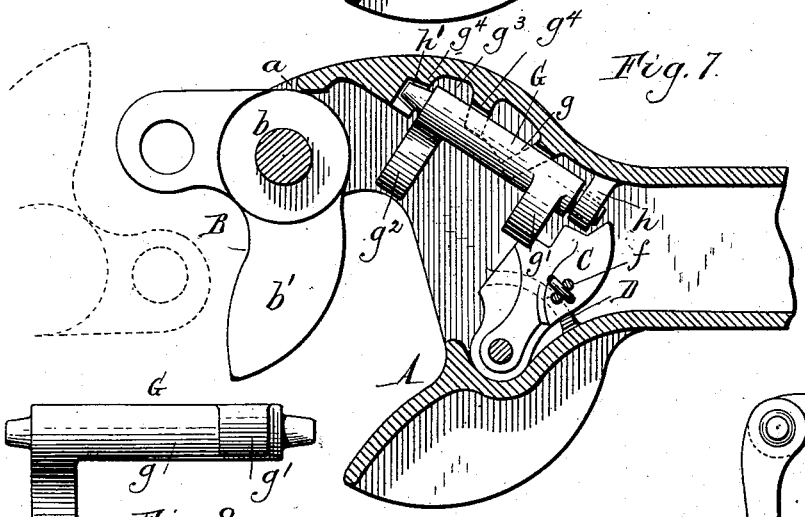


Fig. 7.

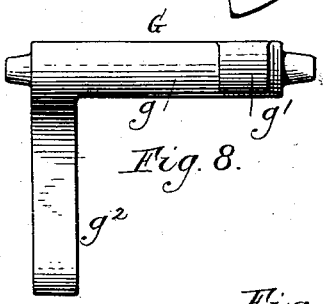


Fig. 8.

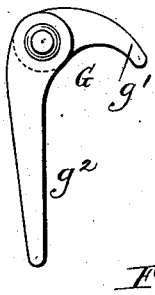


Fig. 9.

Fig. 10.

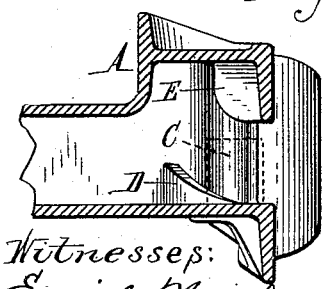


Fig. 11.

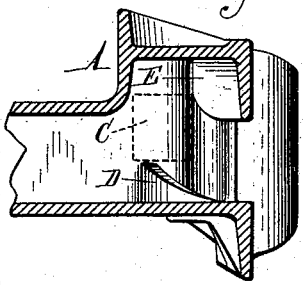
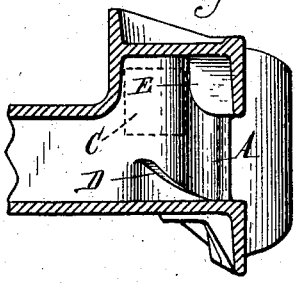


Fig. 12.



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W. F. RICHARDS.

CAR COUPLING.

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Fig. 13.

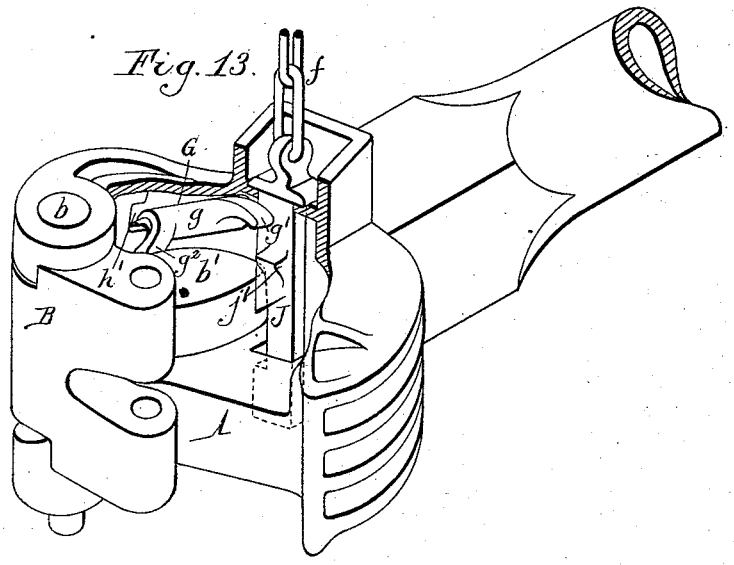
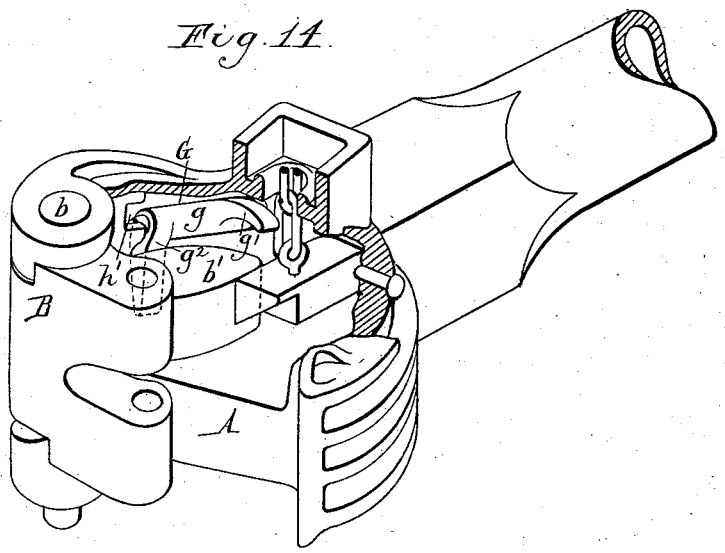


Fig. 14.



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UNITED STATES PATENT OFFICE.

WILLARD F. RICHARDS, OF BUFFALO, ASSIGNOR TO THE GOULD COUPLER COMPANY, OF NEW YORK, N. Y.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 491,134, dated February 7, 1893.

Application filed December 13, 1892. Serial No. 455,035. (No model.)

To all whom it may concern:

Be it known that I, WILLARD F. RICHARDS, a citizen of the United States, residing at the city of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Car-Couplings, of which the following is a specification.

This invention relates to that class of twin car couplers which comprise a swinging coupling jaw or knuckle, an automatic lock for retaining the jaw in its closed or coupled position and means for "kicking" or throwing the jaw to its open position when released by the lock. Prior to my invention various means have been employed for that purpose with a view of positively and reliably opening the coupling jaw in the act of unlocking it. Among others has been used an elbow lever, swinging in a horizontal plane in the draw head, and having its arms so arranged that upon withdrawing the lock from engagement with the locking arm of the jaw, the latter is thrown to its open position, while upon closing the open jaw, the lock is swung into engagement with its locking arm. In this construction one of the arms of the shifting lever is arranged on the rear side of the lock, and the other on the rear side of the locking arm of the coupling jaw, and in order to unlock the jaw and shift the lever to open the jaw, the lock must first receive an upward and backward movement to clear the jaw arm, and then a continued backward movement to shift the lever. To effect this rearward movement of the lock, an incline is arranged in the draw head above the lock and sloped in the proper direction to produce the desired movement. This arrangement of the shifting lever is unsatisfactory, because when the parts are of such dimensions as to permit the draw head to be constructed upon the standard lines, commonly adopted for car couplers of this type, the stroke of the shifting lever is too short to swing out the jaw positively for a sufficient distance to insure its interlocking with the coupling jaw of an opposing car, the principal portion of its opening movement being dependent on the momentum received by it, which is however, unreliable and insufficient in case the operating chain of the lock is pulled slowly or gradually so that the devices operate successfully only when the lock is shifted with a quick impulse. Furthermore the continued backward movement of the lock against its incline after it has cleared the arm of the coupling jaw produces not only considerable friction, but causes the pull on the lock to be exerted upon the lever in an indirect manner, which renders the action of the shifting device hard. The construction referred to is furthermore objectionable, because the shifting arm of the lever, after opening the jaw is liable to remain in the path of this arm, so that in case the coupling jaw, when open, receives a sharp impulse by striking an opposing jaw in coupling, the blow is liable to break the shifting arm of the lever.

The object of my invention is to provide car couplers of this class with a simple and powerful shifting device which will positively open the coupling jaw a sufficient distance to insure its proper engagement with an opposing coupling jaw, without depending upon the momentum of the jaw to open it, and which is not liable to be broken by the coupling jaw when the latter is forcibly closed in coupling.

In the accompanying drawings consisting of three sheets:—Figure 1 is a longitudinal sectional elevation of my improved coupling showing the coupling jaw in its closed or coupled position. Fig. 2 is a cross section thereof in line 2—2 Fig. 1, showing a similar position of the coupling jaw. Fig. 3 is a cross section showing the lock raised sufficiently to unlock the coupling jaw, preparatory to opening or kicking the jaw. Fig. 4 is a cross section showing the position of the parts when the lock is raised to its highest position in which it actuates the shifting device of the coupling jaw. Fig. 5 is a horizontal section of the coupling, showing the parts in the position corresponding to that shown in Figs. 1 and 2. Fig. 6 is a similar section, showing the parts in the position corresponding to that shown in Fig. 3. Fig. 7 is a similar section, with the parts in the position corresponding to that shown in Fig. 4. Fig. 8 is a detached side elevation of the shifting device. Fig. 9 is a detached front view thereof. Figs. 10, 11, and 12, are vertical longitudinal sec-

tions of the draw head on a reduced scale, showing in dotted lines the three different positions of the lock with relation to its inclines. Fig. 13 is a modification of the coupling showing my improvement in connection with a vertically sliding lock. Fig. 14 is another modified construction showing the improvement applied to a coupling of the type, having a vertically swinging lock.

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

A is the drawhead which is preferably constructed in accordance with the commonly recognized standards or dimensions of such couplings, and having the usual chamber or recess for receiving the movable parts of the coupler.

B is the coupling jaw or knuckle pivoted by an upright pin *b* to the forwardly projecting bifurcated arm *a* of the drawhead and having the customary locking arm *b'*.

C is the usual lock or pawl which engages with the arm of the coupling jar for holding the same in its closed or coupled position and which is preferably arranged to swing horizontally in the drawhead.

D is the rearwardly rising incline arranged on the drawhead underneath the lock, for automatically moving it forwardly into engagement with the arm of the coupling jaw when the jaw is swung into its closed position and E is the upper incline arranged on the drawhead above the lock, for swinging the same backward out of engagement with the locking arm of the coupling jaw in unlocking the jaw.

f is the chain attached to the lock whereby the same is raised and which is connected with a hand lever arranged on the end of the car in a well known manner.

G is the shifting device whereby the coupling jaw is kicked or moved into its open position, after being unlocked. This shifting device consists of a horizontal rock shaft *g* arranged in the upper portion of the chamber of the draw head on the same side as the coupling jaw, a substantially horizontal actuating arm *g'* arranged on this shaft and extending laterally into the vertical path of travel of the lock and a shifting arm or finger g^2 extending downward from the rock shaft in a substantially vertical position and standing, when in its normal position, between the rear side of the locking arm of the coupling jaw, and the adjacent inner wall of the drawhead, as most clearly shown in Figs. 1 and 2. The rock shaft *g* is preferably journaled at its inner end in a closed bearing *h*, and at its outer end in an upwardly open bearing *h'* both formed on the adjacent wall of the drawhead, so that the rock shaft can be readily introduced into its bearings and removed therefrom. The shaft is held in place in its open bearing by its weight. The shifting finger g^2 when in its normal depending position, occupies a vertical pocket or recess g^3 formed in the adjacent wall preferably by vertical ribs g^4 which project inwardly beyond the inner edge of the shifting finger when in its vertical position, so as to protect the finger from the blow of the arm of the coupling jaw when the latter is forcibly swung from its open to its closed position.

In the normal locked position of the coupling jaw, shown in Figs. 1, 2, and 5, the lock is engaged with the arm of the jaw and the actuating arm of the shifting device stands above the lock and the shifting finger behind the locking arm of the coupling jaw. When the coupling jaw is in this position and it is desired to "kick" or throw it to its open position, the lock is raised by the usual mechanism to the limit of its upward movement as shown in Figs. 4 and 7. During the first portion of this upward movement the swinging lock is raised against the upper incline E of the drawhead, which latter causes the lock to swing backward until it clears the locking arm of the coupling jaw, while during the latter part of its upward movement the lock strikes the actuating arm *g'* of the rock shaft *g* and swings the said arm upwardly into the position shown in Fig. 4. This movement of the arm causes the rock shaft to turn in the proper direction to swing the depending shifting finger forwardly which latter, engaging against the locking arm of the coupling jaw, positively throws the jaw to its open or uncoupled position. The upper incline of the draw head, which causes the lock to swing rearward out of engagement with the locking arm of the coupling jaw extends rearwardly just a sufficient distance to withdraw the lock out of engagement with the jaw arm, so that as soon as this has been effected the lock is no longer moved backward on the incline, but moves directly upward and strikes the actuating arm of the rock shaft. The lock thus rises freely as soon as it has cleared the locking arm of the hook, and has no further contact with its incline, thereby exerting a direct pull upon the jaw shifting device, without encountering undue friction and enabling the jaw to be opened with greater ease. When the jaw has been thrown to its open position and the locking pawl is dropped the shifting finger returns by gravity to its former pendent position in which it is guarded by the protecting ribs so that when the open coupling jaw is violently swung to its locked position by the blow of an opposing coupler, its arm will not strike the depending shifting finger, whereby breakage of the finger is obviated. This finger is longer and heavier than the actuating arm of the rock shaft and will therefore with the aid of the weight of the overhanging actuating arm return automatically to its normal hanging position. When the coupling jaw swings inwardly to its locked position its locking arm swings the lock backward on its lower incline and as soon as the locking arm passes inwardly beyond the free end of the lock, the latter rides down its incline and automatically interlocks with the arm of the coupling jaw in the usual manner.

If it is desired to simply unlock the coupling hook to uncouple the car, without using the shifting mechanism, the lock is only raised sufficiently to clear the arm of the coupling jaw as shown in Figs. 3 and 6. and held there by the usual retaining bracket or devices on the car which are commonly used for that purpose.

My improved shifting device is not only direct in its action and easily operated, but its peculiar construction and arrangement enable its shifting arm to be made so long as to insure a sufficient outward movement of the coupling jaw to permit it to reliably interlock with the jaw of an opposing coupling, irrespective of whether the shifting device receives a slow or a quick impulse. This construction also enables the finger to be thus lengthened without requiring a construction of the draw head which departs from the essential lines and dimensions commonly adopted for couplers of this class.

The construction of my improved shifting mechanism is very simple and inexpensive as the actuating arm and shifting finger may be cast complete with the rock shaft and the bearings of the latter are cast with the draw head. The shifting device moreover has no loose parts which are liable to become lost.

In the modified form of my invention illustrated in Fig. 13, a vertically sliding lock J is employed instead of a horizontally swinging one and the lock is provided on its front side with a lug or projection j' into the path of which the actuating arm of the shifting device extends and which strikes said arm on being pulled upward.

Fig. 14, shows the application of my improved shifting device to a coupling having a vertically swinging lock, which is pivoted at its rear end by a horizontal pin. In this case the lock when raised sufficiently strikes the actuating arm with its free front end, thereby opening the coupling jaw.

I claim as my invention:

1. The combination with the draw head, the coupling jaw, and its lock, of a shifting device for opening the jaw, having an actuating arm, projecting into the path of the lock and a depending shifting finger for throwing the jaw to its open position when unlocked, substantially as set forth.

2. The combination with the draw head, the coupling jaw, having a locking arm and the movable lock, of a rock shaft journaled in the draw head, having an actuating arm arranged in the path of the movable lock and a depending arm which engages against the locking arm and throws the jaw to its open position when unlocked, substantially as set forth.

3. The combination with the draw head and the coupling jaw having a locking arm and the vertically movable lock for holding the jaw in its closed position of a horizontal rock shaft journaled in the draw head and having a horizontal arm arranged above the vertically movable lock and in the path thereof, and a depending shifting finger, arranged on the rear side of the locking arm of the coupling, jaw, substantially as set forth.

4. The combination with the draw head and the coupling jaw, having a locking arm, and the lock, of a shifting device having an arm projecting into the path of the lock, and a depending shifting finger engaging against the locking arm of the jaw, and a guard which protects the shifting finger from the blow of the jaw, substantially as set forth.

Witness my hand this 10th day of December, 1892.

WILLARD F. RICHARDS.

Witnesses:
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JNO. J. BONNER.