W. F. RICHARDS.

CAR COUPLING.

APPLICATION FILED APR. 6, 1908.

970,113.

Patented Sept. 13, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

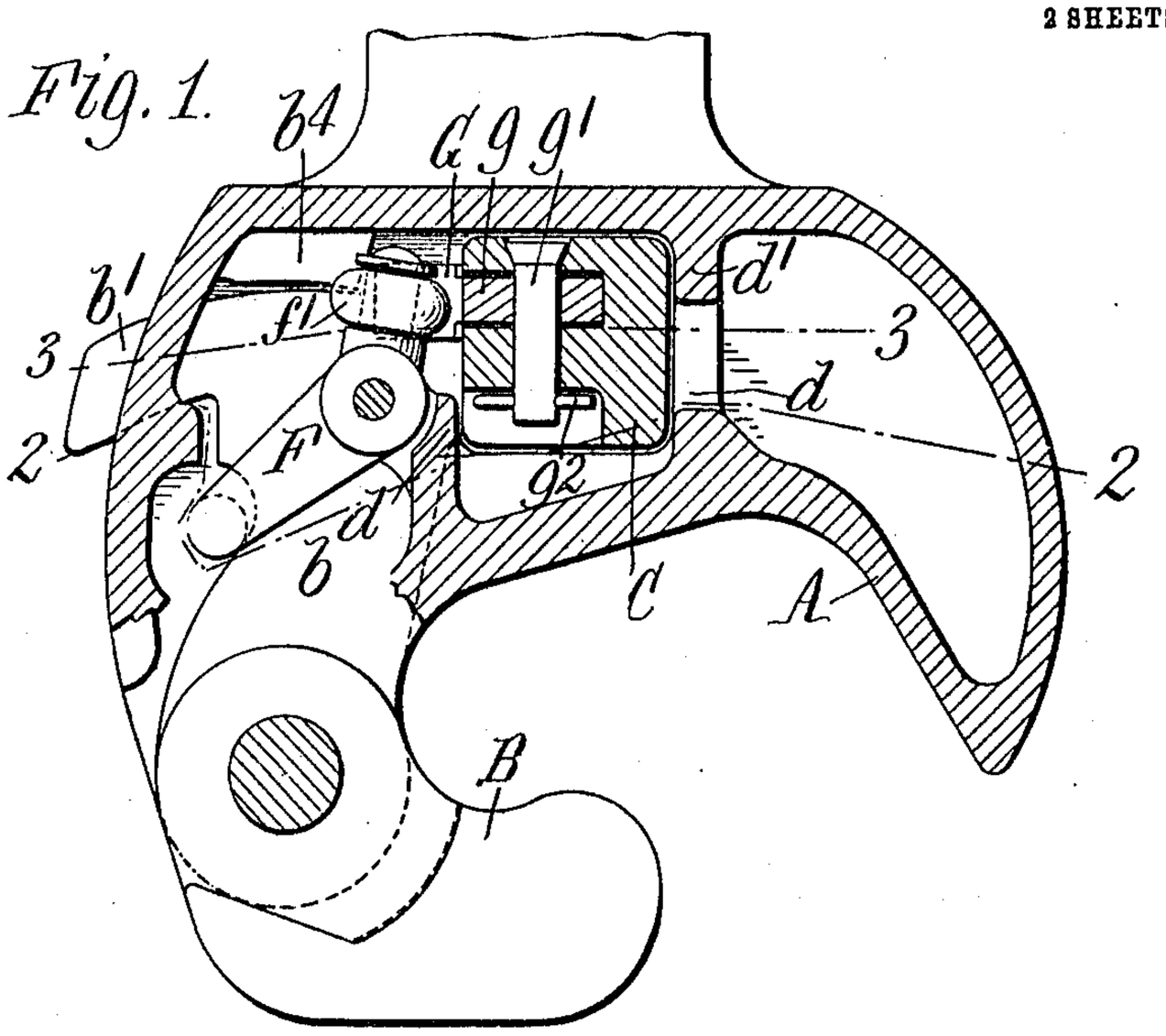

Fig. 2.

Witnesses:

E. A. Volk.

A. G. Dimond.

Inventor.

Willard F. Richards,

by Wilkes, Parker & Hand,

Attorneys

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2 SHEETS—SHEET 2.

Fig. 3.

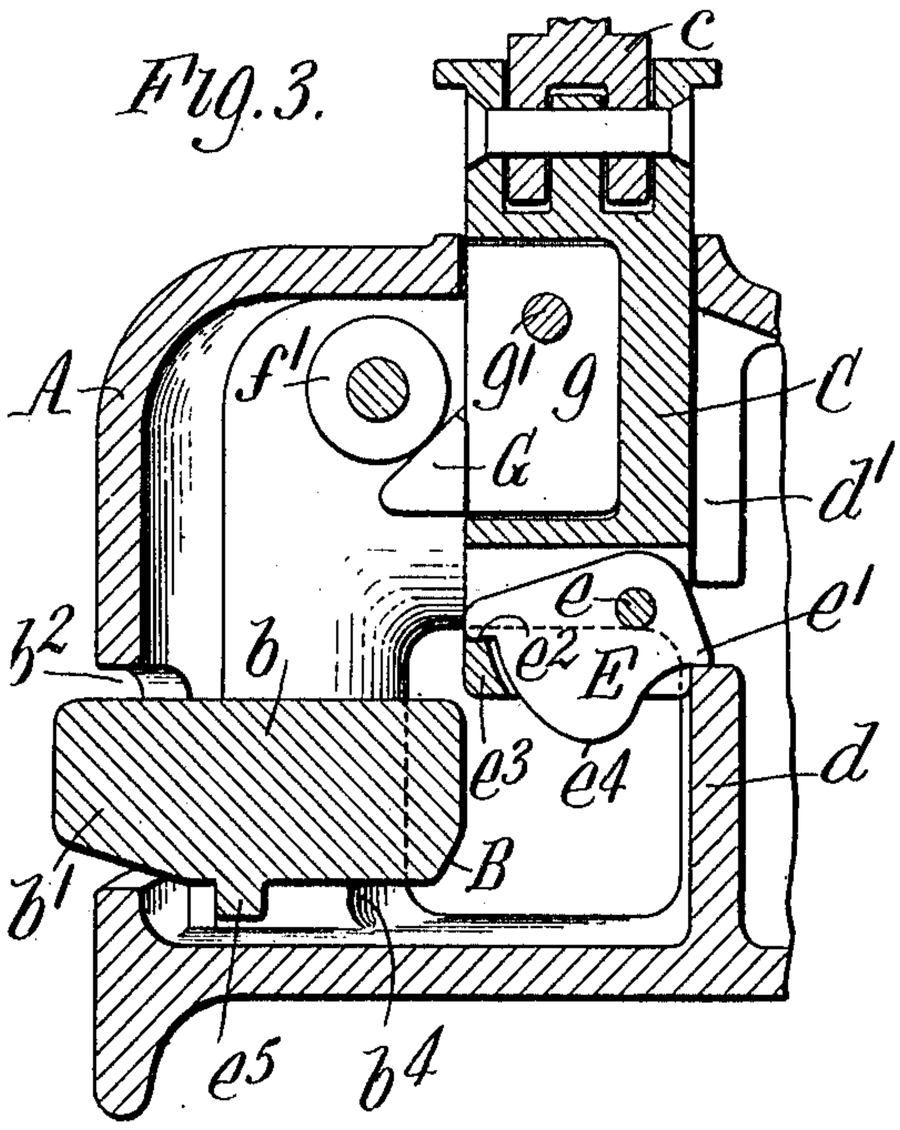


Fig. 4.

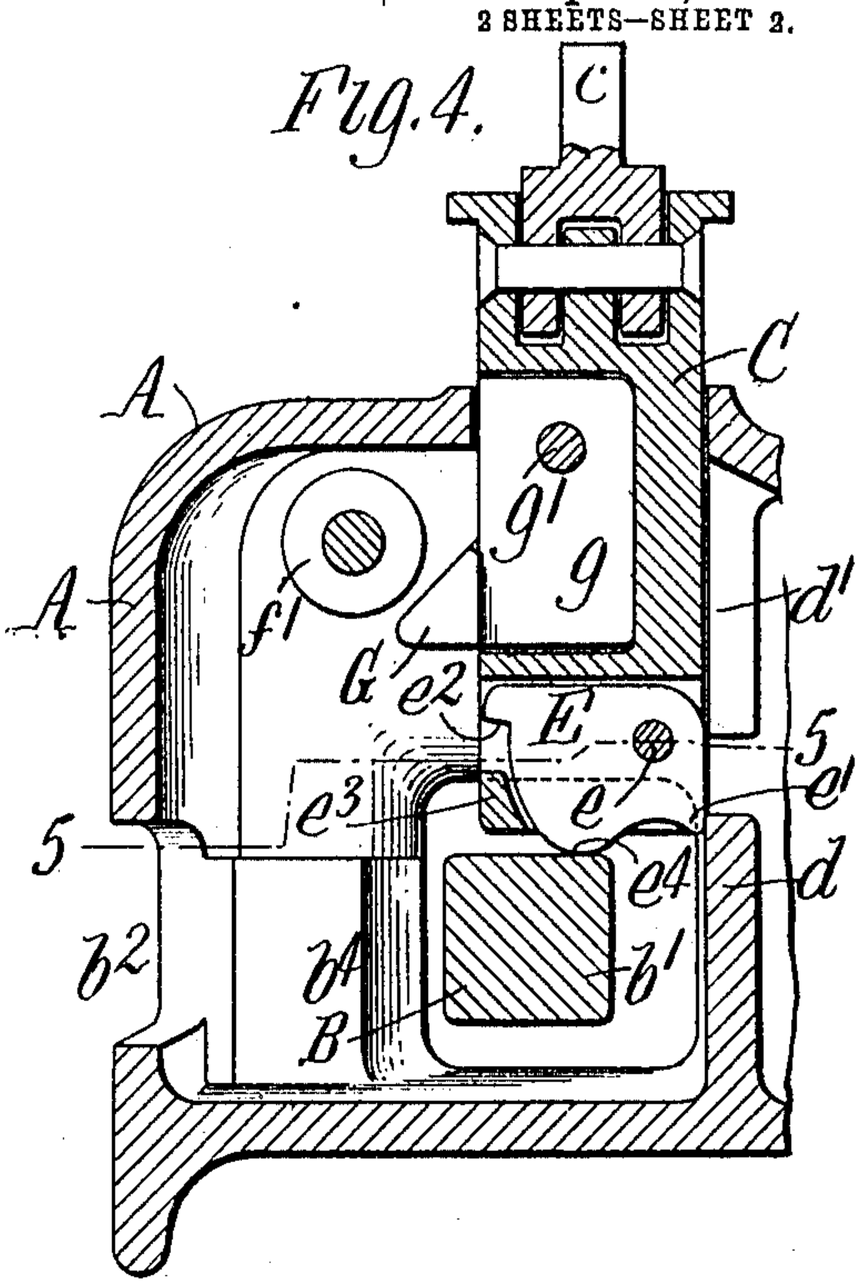
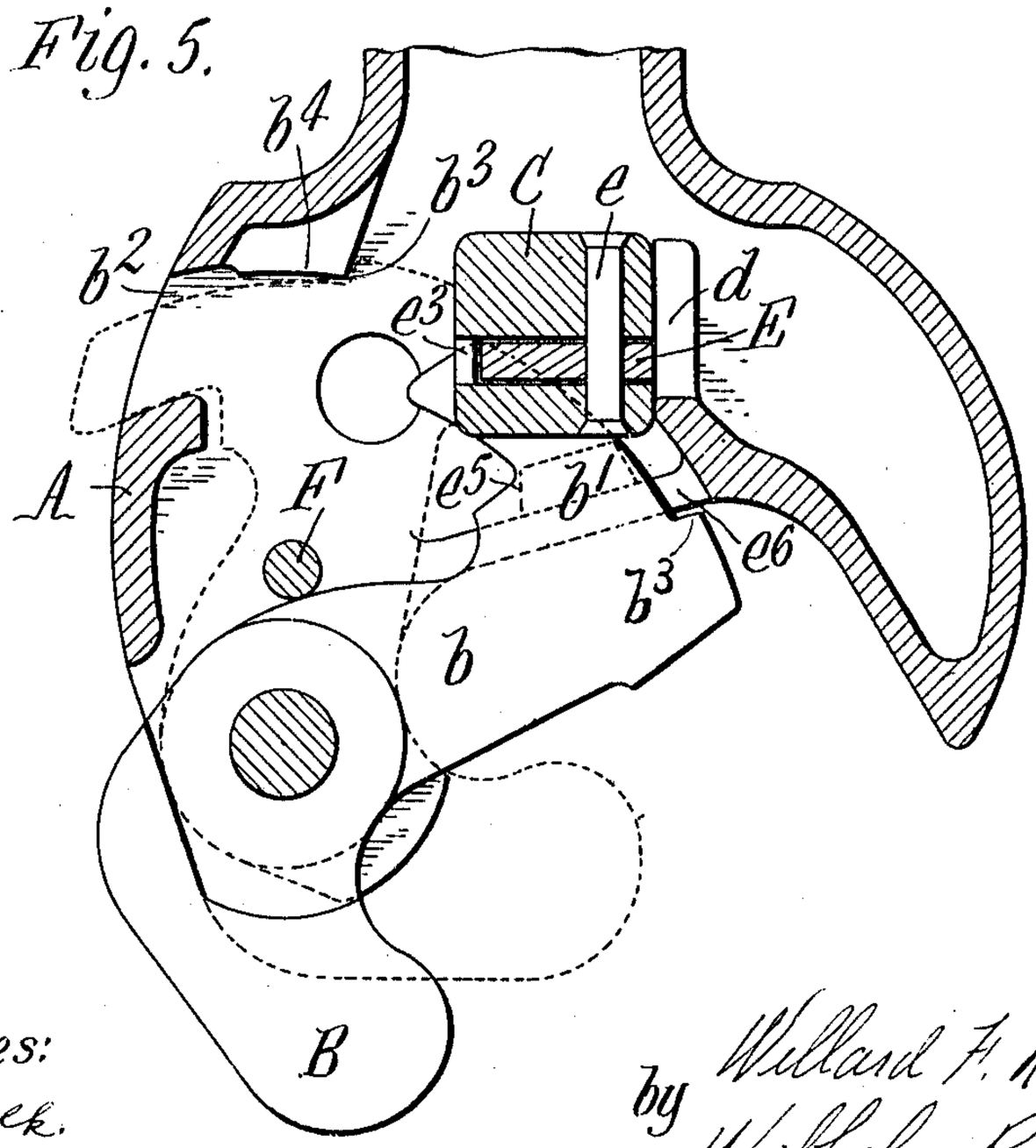


Fig. 5.



Witnesses:
E. a Volk.
A. G. Dimond.

Inventor.
by Willard F. Richards,
Wilkelm, Parker & Hayd
Attorneys

UNITED STATES PATENT OFFICE.

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

CAR-COUPLING.

970,113. Specification of Letters Patent. **Patented Sept. 13, 1910.**

Application filed April 6, 1908. Serial No. 425,307.

To all whom it may concern:

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

This invention relates more particularly to car couplers of the Master Car Builders' type which have a vertically movable gravity-operated lock for the knuckle.

The principal objects of the invention are to produce a strong and serviceable coupler of this type capable of easy operation, which is composed of few parts of simple construction which can be economically made and assembled and will not readily get out of order; also to provide a positive and reliable lock set or device which holds the lock up in its released position, when it is raised to release the knuckle, until the knuckle is swung open and then releases the lock so that it will act automatically to lock the knuckle when the knuckle is again closed; also to provide means of novel and simple construction operated by lifting the knuckle lock, for swinging the knuckle open; also to so arrange and construct a knuckle lock having a lock set and knuckle opening means, that the tail of the knuckle has an extended bearing against the lock to resist the opening of the knuckle in the use of the coupler; also to construct the knuckle and coupler head so that they will better stand the severe strains and shocks caused by buffing blows on the knuckle; and also to improve car couplers of this type in the respects hereinafter described and set forth in the claims.

In the accompanying drawings, consisting of two sheets: Figure 1 is a sectional plan view in line 1—1, Fig. 2, of a car coupler embodying the invention, showing the knuckle closed and locked. Fig. 2 is a transverse sectional elevation thereof in line 2—2, Fig. 1, a portion of the lock being broken away to disclose the lock set. Fig. 3 is a fragmentary transverse sectional elevation thereof in line 3—3, Fig. 1, showing the lock held up by the lock set. Fig. 4 is a similar view thereof, showing the position of the parts when the knuckle is open. Fig. 5 is a sectional plan view thereof, in line 5—5, Fig. 4, showing the knuckle open by full lines, and closed by broken lines.

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

A represents the coupler head, and B the swinging knuckle which, as usual, is suitably hinged at one side of the head to swing horizontally. Except as presently described, the head and knuckle are of substantially the usual construction. The knuckle has a tail b provided with a lateral extension b', substantially concentric with the knuckle pivot, which projects through a hole b^2 in the side of the coupler head. A shoulder b^3, Fig. 5, provided at the inner extremity of the tail is adapted, when the knuckle is closed, to strike against an abutment or lug b^4 provided in the rear portion of the head substantially at the juncture of the same with the draw-bar. Any blows on the knuckle tending to swing it inwardly, that is, in the direction to close it, are transmitted through the tail of the knuckle and the shoulder b^3 thereon to this abutment b^4, and as the abutment is far removed from the knuckle pivot the greater leverage thus obtained enables it to effectually resist the severe blows and shocks to which the knuckle is subjected in the use of the coupler. The front face of the abutment is located immediately back of and close to the rear face of the tail extension of the knuckle in such a position as to be intersected by a line extending rearwardly from the knuckle pivot obliquely toward the center line of the draw-bar, so that any direct blow on the knuckle hard enough to bend the hinge connection of the knuckle or cause the parts to give will be received by the abutment b^4, thereby preventing injury to the knuckle hinge. As such blows are transmitted toward the center line of the draw-bar and received by the strongest part of the coupler head, the possibility of the coupler being strained or injured is greatly reduced. The front face of the abutment b^4 is curved on a different radius from the rear face of the tail extension of the knuckle which is slightly eccentric, as shown in Fig. 1, so that if these faces are caused to contact by severe blows on the coupler, the contact will only be at the inner end of the abutment and the tail extension will clear the abutment in the first portion

of the opening movement of the knuckle. The abutment does not therefore prevent the knuckle from being easily operated.

C represents the upright knuckle lock or pin which is located in the rear central portion of the head and projects through a hole in the roof of the coupler. A suitable link *c* is pivoted to the projecting upper end of the lock for attachment to an operating device. The lock is movable vertically into and out of locking position between one side of the tail *b* of the knuckle and upright ribs or walls *d d'* projecting from the front and rear walls of the coupler head, against which ribs the lock bears to hold the knuckle closed.

E represents a lock set or latch which is arranged in a transverse slot or recess in the lower end of the lock in which it is pivoted near one end on a horizontal rivet or pin *e* extending through the lock in a fore and aft direction. When the lock is lifted to unlock the knuckle, the heavy free end of the lock set will swing downwardly by gravity so as to throw a nose or part *e'* at the opposite end thereof over a horizontal face on the bearing rib *d* in the coupler head, and cause a lug or shoulder e^2 at the opposite end of the lock set to bear on a cross bar or piece e^3 on the lock beneath the same, as shown in Fig. 3, whereby the lock will be positively and securely held in the raised or unlocked position. When the lock set is in this position a cam-shaped portion e^4 thereof depends below the bottom of the lock in such position that when the knuckle is swung open after the lock has been raised and set, as explained, its tail will strike said cam portion and swing the free end of the lock set upwardly, withdrawing its nose *e'* from engagement with the holding face on the rib *d*. The lock set will ride up on the knuckle tail during the opening movement of the knuckle and bear on the tail extension when the knuckle is completely open, as shown in Figs. 4 and 5, thereby holding the lock up. A depending lug e^5 on the knuckle tail is adapted to strike a rib e^6, Fig. 5, on the floor of the head to prevent the knuckle from opening far enough for its tail extension to pass from under the lock set and permit it to drop. When the tail of the knuckle passes from under the lock in closing the knuckle, the lock will drop by gravity at the side of the tail and lock the knuckle. The lock set or latch for the lock bears on a fixed or stationary part of the head to hold the lock up prior to the opening of the knuckle, and not on the movable knuckle. When the knuckle is swung open it strikes and trips the lock set, so that the device is positive and certain in action and can be relied upon to act as intended.

F represents a knuckle opener or kicker which consists of a lever pivoted between its ends on an upright pivot *f*, suitably supported in the coupler head, and having an arm depending at the outer or rear side of the knuckle tail and another arm extending into proximity to the lock and preferably provided with an anti-friction roller *f'*. The lock is provided with a lateral kicker-operating lug or extension G which projects from one side thereof beneath the anti-friction roller on the kicker lever F and has an upper inclined or cam face for engaging said roller to operate the kicker. This lug G is preferably part of a separate block or piece *g* which is secured in a side recess in the lock C by a horizontal pin or bolt *g'* passing through registering holes in the lock and lug block. The pin *g'* is held in place by a cotter pin g^2 or other fastening device located in a recess in the front of the lock, see Figs. 1 and 2. The lug block can be placed in its recess in the lock when the latter is in its lower position in the head, and then by pulling the lock up to its limit the holes for the securing pin *g'* are exposed above the roof of the coupler head and the pin can be inserted and fastened by the cotter pin g^2. By this construction the hole in the roof of the coupler head for the lock C need only be large enough for the free passage of the body of the pin. The kicker-passage of the body of the pin. The kicker-operating lug G has side shoulders, see Fig. 1, which bear against the face of the lock at opposite sides of the recess for the lug block *g*, so that the lug acts as a rigid or integral part of the lock. It is made separate, as explained, for convenience in manufacturing and assembling the parts of the coupler. When the lock is pulled up to its limit the inclined face of the lug G acting on the roller of the kicker lever will swing this lever on its pivot and throw the knuckle open. The knuckle can be thus opened by pulling the lock up, whether the lock is in its locking or set position.

With the parts constructed and arranged as described, the lock, although provided with a lock set and operating means for the knuckle-opening lever, affords an extended bearing for the tail of the knuckle at a considerable distance from the knuckle pivot and produces a very strong and serviceable coupler.

I claim as my invention:

1. In a car coupler, the combination of a coupler head having a fixed bearing part for the lock set, a horizontally-swinging knuckle, a vertically movable lock for the knuckle, and a lock set which is pivoted to said lock and has a part adapted when the lock is lifted to bear on said fixed part in the coupler head to hold the lock in released position, said lock set having a part which is engaged by the upper portion of the tail of the knuckle to disengage the lock set from

said fixed part in the head when the knuckle is opened and which rests on the upper portion of the tail of the knuckle to hold the lock up until the knuckle is closed, substantially as set forth.

2. In a car coupler, the combination of a coupler head having a fixed upright bearing part, a horizontally-swinging knuckle, a lock for the knuckle which is movable vertically into and out of locking position between the tail of the knuckle and said fixed part in the head, a lock set pivoted to the lower end of said lock and having a part which is adapted to bear on said fixed part in the head to hold the lock in released position, said lock set having a part which depends below said lock and is engaged by the upper portion of the tail of the knuckle to disengage the lock set from said fixed part in the coupler head when the knuckle is opened and which rests on top of the knuckle tail to hold the lock up until the knuckle is closed, substantially as set forth.

3. In a car coupler, the combination of a coupler head having a fixed upright internal part, a horizontally-swinging knuckle having a tail, a lock for the knuckle which is slidable vertically between said upright part in the coupler head and the tail of the knuckle, and a lock set which is pivoted to the lower end of said lock and has a part adapted when the lock is lifted to bear on said fixed part in the coupler head to hold the lock up with its lower end above the tail of said knuckle so that the tail of the knuckle can swing beneath said lock, said lock set having a part which depends below said lock and is engaged by the tail of the knuckle to disengage the lock set from said fixed part in the coupler head when the knuckle is opened and which rests on the top of the knuckle tail to hold the lock up until the knuckle is closed, substantially as set forth.

4. In a car coupler, the combination of a coupler head having an upright bearing wall therein, a horizontally-swinging knuckle having a tail, a lock for the knuckle arranged to slide vertically between said upright wall and the tail of the knuckle, a kicker lever for opening the knuckle pivoted in the head to swing horizontally and having an arm engaging the tail of the knuckle and a laterally projecting arm, a lock set connected to the lower end of said lock and adapted to project therefrom at one side to bear on said upright wall for holding the lock in the raised position, and a lug which projects from said lock at the opposite side thereof and engages said lateral arm of the kicker lever for swinging the kicker lever to open the knuckle when the lock is lifted whereby the pressure of the kicker lever against the lock forces the lock against said upright wall and insures the engagement of the lock-set with said wall, substantially as set forth.

Witness my hand, this 1st day of April, 1908.

WILLARD F. RICHARDS.

Witnesses:
C. W. PARKER,
C. B. HORNBECK.