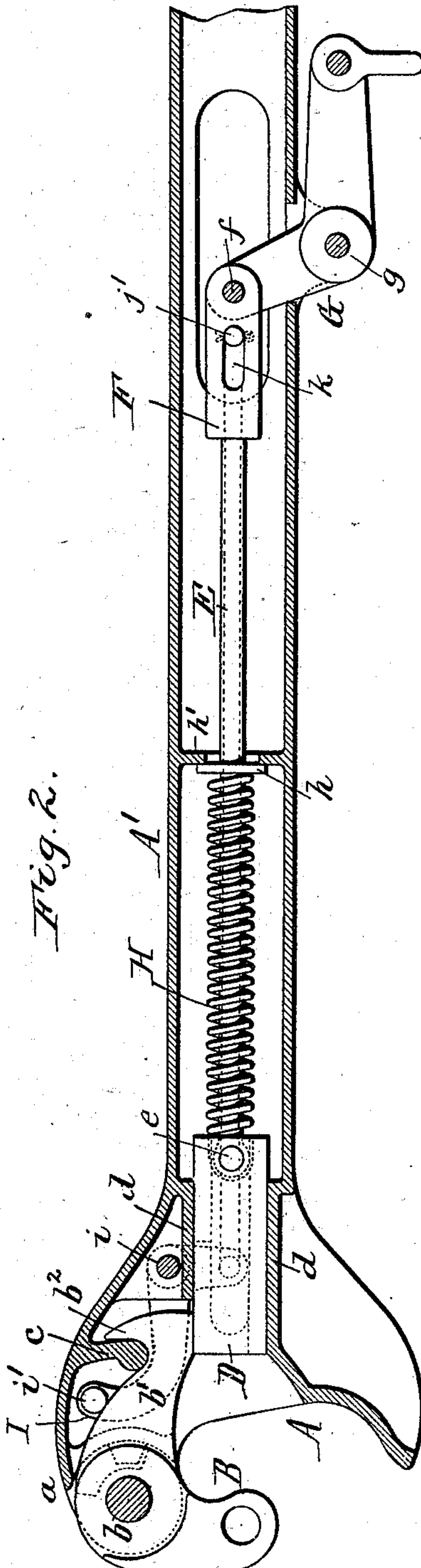
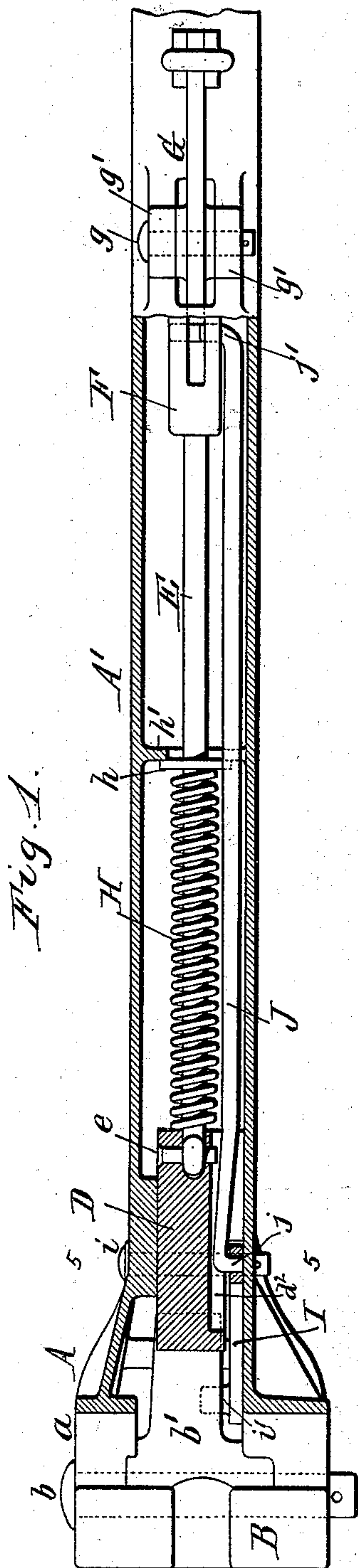


W. F. RICHARDS.
CAR COUPLING.

No. 560,864.

Patented May 26, 1896.



Chas. F. Burkhardt.
Henry L. Deck. } Witnesses.

W. F. Richards Inventor.
By Wilhelm H. Pomeroy Attorneys

(No Model.)

3 Sheets—Sheet 2.

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Fig. 3.

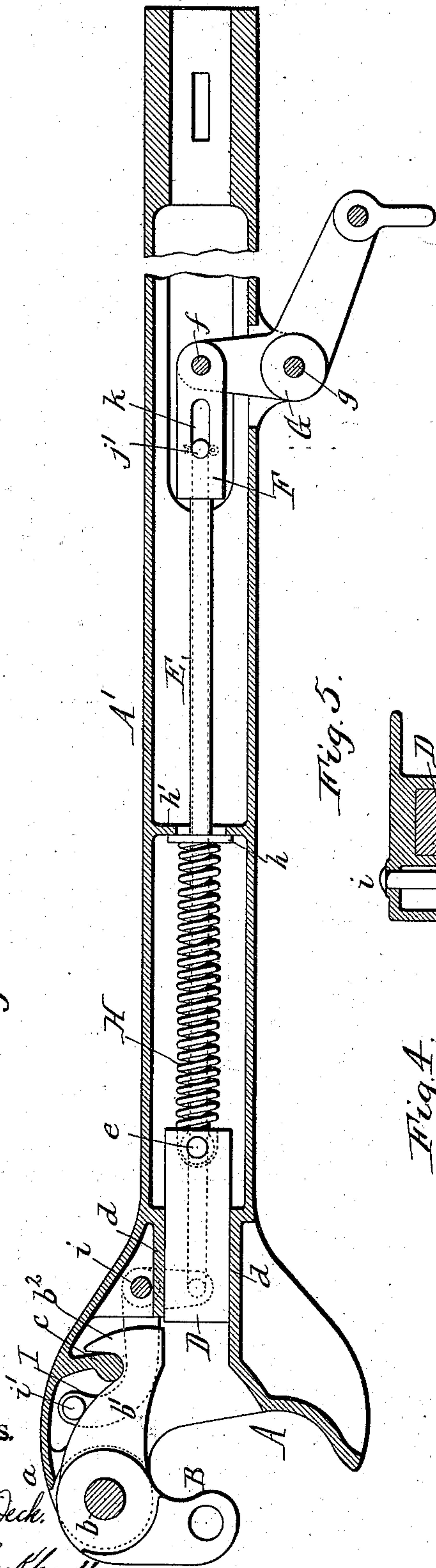


Fig. 5.

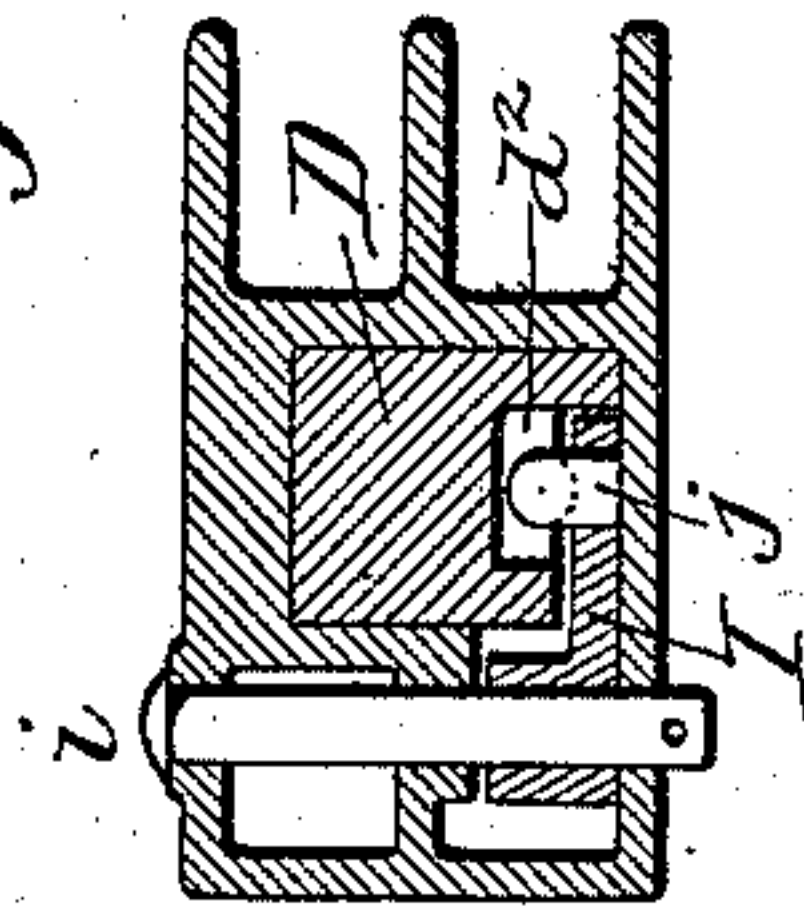
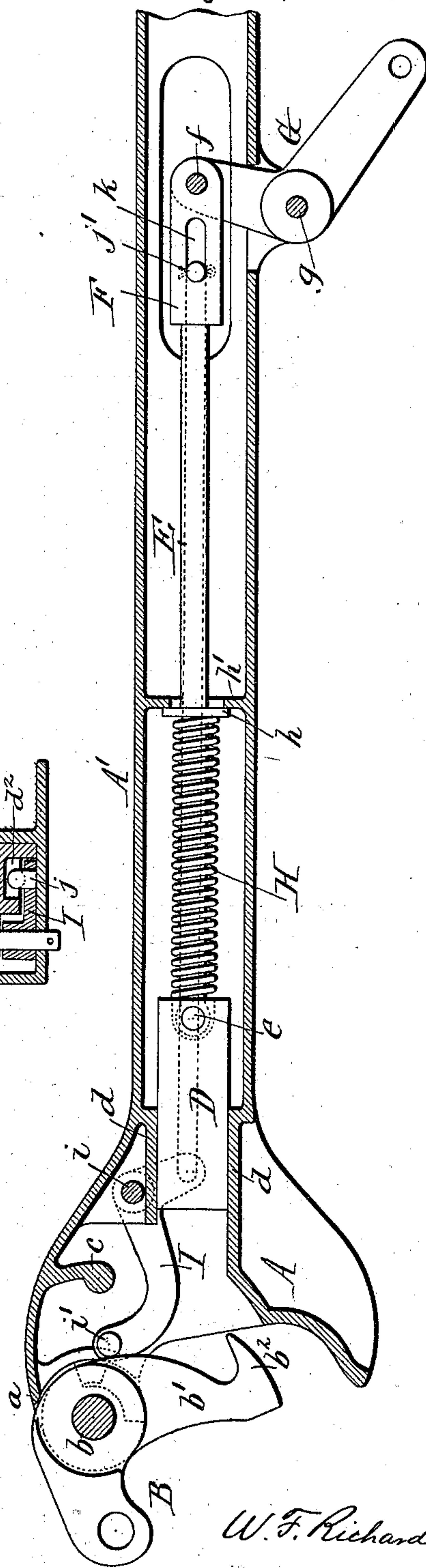


Fig. 4.



WITNESSES.

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(No Model.)

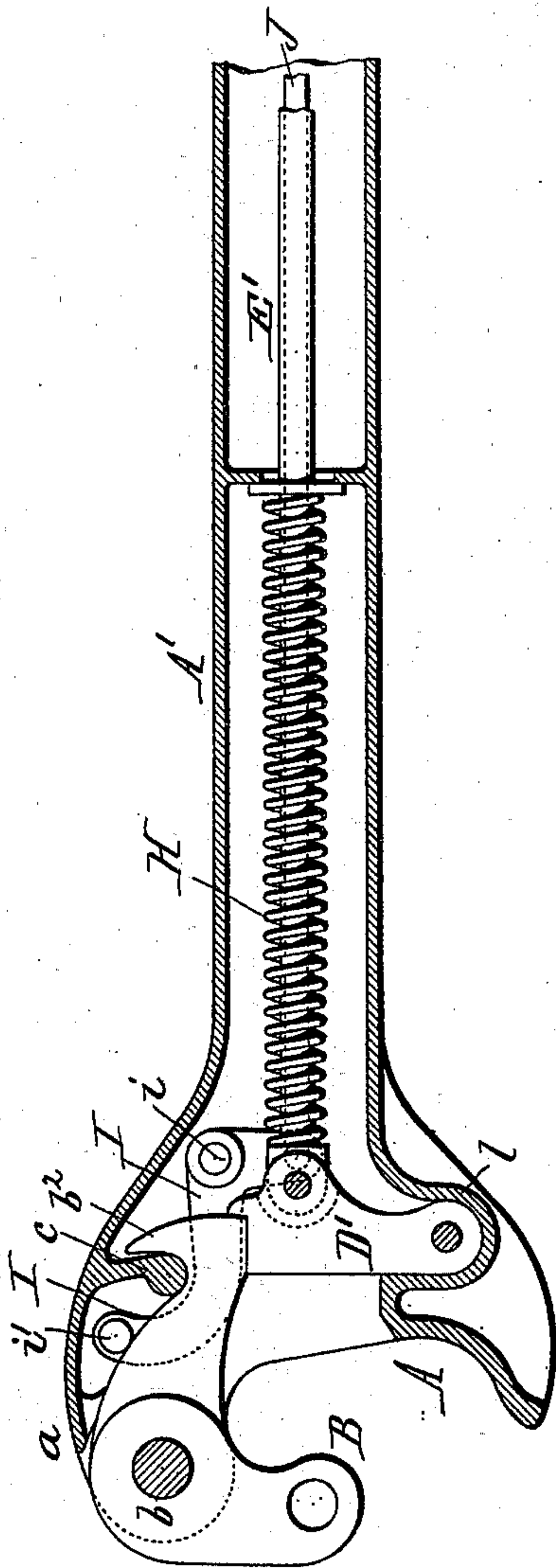
3 Sheets—Sheet 3.

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Fig. 6.



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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. 560,864, dated May 26, 1896.

Application filed March 14, 1896. Serial No. 583,157. (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 automatic twin-jaw car-couplings which are provided with a horizontally-swinging knuckle or jaw and a shifting device or "kicker" for swinging the knuckle into its open position when released by the lock and in which the kicker is operated independently of the lock.

The invention has more particular reference to a coupling of this kind which is especially desirable for the cars of elevated and street railways.

My invention has for its object to produce an efficient car-coupling of this character which is reliable in action and which can be conveniently operated.

In the accompanying drawings, consisting of three sheets, Figure 1 is a sectional elevation of my improved car-coupling. Fig. 2 is a horizontal section thereof, showing the knuckle in its closed or coupled position. Fig. 3 is a similar view showing the lock withdrawn to release the knuckle. Fig. 4 is a similar view showing the knuckle kicked to its open position. Fig. 5 is a cross-section in line 5 5, Fig. 1. Fig. 6 is a horizontal section showing my improvements adapted to a coupler with a horizontally-swinging lock.

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

A is the draw-head, which is recessed or chambered to receive the operative parts of the coupling and preferably constructed upon similar lines to the standard type of couplers now in use, but of smaller dimensions to adapt the same to the class of cars for which it is more particularly designed.

A' is the shank or draw-bar, which is comparatively long and provided at its rear end with means for attaching it to the draft-gear in such a manner as to permit the wide lateral play of the coupling required by the

cars of elevated and street railways owing to the short curves of such roads.

B is the horizontally-swinging knuckle pivoted to the bifurcated lug *a* of the draw-head by the usual pin *b*, and *b'* is the tailpiece or locking-arm of the knuckle, which preferably has a safety hook or nose *b*², which engages behind an internal rib *c* of the draw-head in the closed position of the knuckle.

D is the lock, which, in the construction shown in Figs. 1 and 5 of the drawings, is arranged to slide lengthwise in the rear portion of the draw-head and the front portion of the draw-bar, which latter is hollow. This lock is guided in its movements between upright parallel walls or webs *d d*, formed within the draw-head. The lock is retracted by means of a longitudinal connecting-rod E, extending rearwardly therefrom and connected at its rear end to a head or enlargement F, which is pivoted by a vertical pin *f* to the inner arm of a horizontal actuating or elbow lever G. This lever is pivoted by a vertical pin *g* to ears *g'*, projecting from the side of the draw-bar, and the latter is provided in its adjacent wall with a slot, through which the inner or short arm of the elbow-lever passes, as shown in Figs. 2, 3, and 4. When the outer or long arm of this lever is swung outwardly, its short arm is swung rearwardly, as shown in Figs. 3 and 4, thereby retracting the lock through the medium of the connecting-rod E and releasing the knuckle. The connecting-rod E is pivoted at its front end to the lock by a vertical pin or bolt *e*, so as to permit the necessary lateral movement of the rear end of the rod to prevent binding. The elbow-lever G may be operated by any convenient or suitable means.

H is a spring whereby the lock is yieldingly retained in its forward or locking position and returned to that position after being retracted. This spring surrounds the operating-rod E and bears at its front end against the lock and at its rear end against a washer *h*, which in turn abuts against a slotted or perforated web *h'*, formed within the hollow draw-bar.

I is the kicker or shifting-lever, which opens the knuckle when the latter is unlocked.

This lever is arranged to swing horizontally in the lower portion of the draw-head and is pivoted to the latter by a vertical pin *i*. The front arm of this kicking-lever is provided with an upwardly-extending lip or projection *i'*, which is adapted to bear against the rear side of the locking-arm *b'* of the knuckle, as shown in Figs. 2 and 3. The rear arm of the kicking-lever is arranged at an angle to its front arm and is operated from the actuating-lever G by a rod J, extending rearwardly from the kicking-lever and arranged in the hollow draw-bar. The front end of this operating-rod is preferably bent downward to form a pivot-pin *j*, which engages in an opening formed in the rear arm of the kicking-lever, as shown in Figs. 1 and 5, and the lock is provided in its under side with a longitudinal groove or recess *d'* for clearing the raised front portion of the kicker-operating rod. The rear end of the operating-rod J is connected with the enlargement F of the lock-operating rod in such a manner that the kicker-operating rod is not effected by the initial portion of the rearward movement of the lock-operating rod, but is allowed to remain at rest until the latter rod is moved backward sufficiently to withdraw the lock from engagement with the knuckle, and so that as soon as the lock is retracted the continued rearward movement of the lock-operating rod compels the kicker-operating rod to move rearwardly therewith, thereby swinging the kicking-lever in the proper direction to cause its front arm to throw the knuckle into its open position. In the construction shown in the drawings this connection consists of an upright pin *j'*, arranged at the rear end of the kicker-operating rod J and engaging in a longitudinal slot *k*, formed in the enlargement F, said pivot-pin being preferably formed by bending the end of the operating-rod at right angles to its body, as shown in Fig. 1. The relation of the parts is such that when the knuckle is closed the rear pin of the kicker-operating rod is located at the rear end of the slot *k*, as shown in Figs. 1 and 2, so that when the lock is retracted the rearward movement of its operating-rod is not imparted to the rod of the kicker, the slot *k* being made of such a length that immediately after the lock has been withdrawn sufficiently to release the knuckle the front end of the slot strikes the rear pin of the kicker-operating rod, as shown in Figs. 3 and 4, shifting the rod rearwardly with the lock-operating rod.

In the operation of my improved car-coupling, when the knuckle is in its closed or coupled position, the kicking-lever and the lock occupy the positions shown in Fig. 1. When it is desired to simply uncouple the cars without kicking the knuckle, the lock is withdrawn sufficiently to release the knuckle, as shown in Fig. 3, when the knuckle will be opened by the separation of the cars. If it is desired to fully open the knuckle as well as unlock the same, the lock is withdrawn to the

extremity of its backward movement, which causes the operating-rod of the kicker to be shifted rearwardly, thus actuating the kicker, as hereinbefore described. By the rearward movement of the lock the spring II is compressed, and as soon as the lock is released the spring reacts and returns the lock to its former position, ready to interlock automatically with the knuckle when the same is again swung into its closed position. During the last portion of this forward movement of the lock-operating rod the rear end of the slot *k* comes in contact with the rear pin *j'* of the kicker-operating rod J, thereby shifting the latter forward and restoring the kicker to its normal position. This last-named action constitutes an important feature of my coupling, as it guards effectually against breakage of the kicking-lever, which is liable to occur when the kicker has no independent means for resetting it, but depends for its restoration to the normal position upon the blow received from the knuckle during the closing movement of the latter. The elbow-lever G constitutes the actuating device from which the lock and the kicker are both operated, but independently of each other, and this actuating device is carried by the laterally-movable draw-bar and thus maintains its proper position relatively to the parts of the coupler in all positions of the draw-bar.

My improvements are equally applicable to couplers having locks of other types. For example, the same may be used in connection with a horizontally-swinging lock, as shown in Fig. 6. In this case the draw-head is formed with a side pocket *l* for receiving the pivoted end of the lock *D'*, and the operating-rod *E'* of the lock is connected to the free end thereof.

I claim as my invention—

1. The combination with the draw-head, the draw-bar and the knuckle or coupling-jaw, of a lock engaging with the knuckle, a kicking-lever operating against the knuckle, an actuating-lever pivoted to the draw-bar in rear of the kicking-lever, and connected with the lock, and a connection extending from the kicking-lever to said actuating-lever, substantially as set forth.

2. The combination with the draw-head, the draw-bar and the knuckle or coupling-jaw, of a lock engaging with the knuckle, an actuating-lever pivoted to the draw-bar and connected with the lock, a kicking-lever operating against the knuckle, and a connection between the kicking-lever and said actuating-lever, which permits the kicking-lever to remain at rest during the initial movement of the actuating-lever, but transmits the subsequent movement of said lever to the kicking-lever, substantially as set forth.

3. The combination with the draw-head and the knuckle or coupling-jaw, of a lock engaging with the knuckle, an actuating-lever connected with the lock, a slotted head connected with the actuating-lever, and a con-

nection extending rearwardly from the kicking-lever and engaging with said slotted head, substantially as set forth.

4. The combination with the draw-head and
5 the knuckle or coupling-jaw, of a lock engaging with the knuckle, an actuating-lever connected with the lock, a kicking-lever operating against the knuckle, a connection between
10 the actuating-lever and the kicking-lever which permits the actuating-lever to operate during its initial movement independently of the kicking-lever, and a spring whereby the kicking-lever is returned to its normal position, substantially as set forth.

15 5. The combination with the draw-head, the draw-bar and the knuckle or coupling-jaw, of a lock engaging with the knuckle, an actuating-lever pivoted to the draw-bar, a rod connecting the lock with said lever and having
20 a longitudinal slot, a return-spring applied to said connecting-rod, a kicking-lever operating against the knuckle, and a connecting-

rod extending rearwardly from the kicking-lever and having a pin or projection engaging in the slot of the connecting-rod, substantially as set forth. 25

6. The combination with the draw-head, the draw-bar and the knuckle or coupling-jaw, of a sliding lock engaging with the knuckle, a horizontally-swinging actuating-lever mounted
30 on the draw-bar, a rod pivoted at its front end to the lock and having at its rear end a slotted head pivoted to said actuating-lever, a kicking-lever operating against the knuckle and a rod connected at its front end to the
35 kicking-lever and engaging at its rear end with said slotted head, substantially as set forth.

Witness my hand this 10th day of March, 1896.

WILLARD F. RICHARDS.

Witnesses:

CARL F. GEYER,
KATHRYN ELMORE.