

No. 743,767.

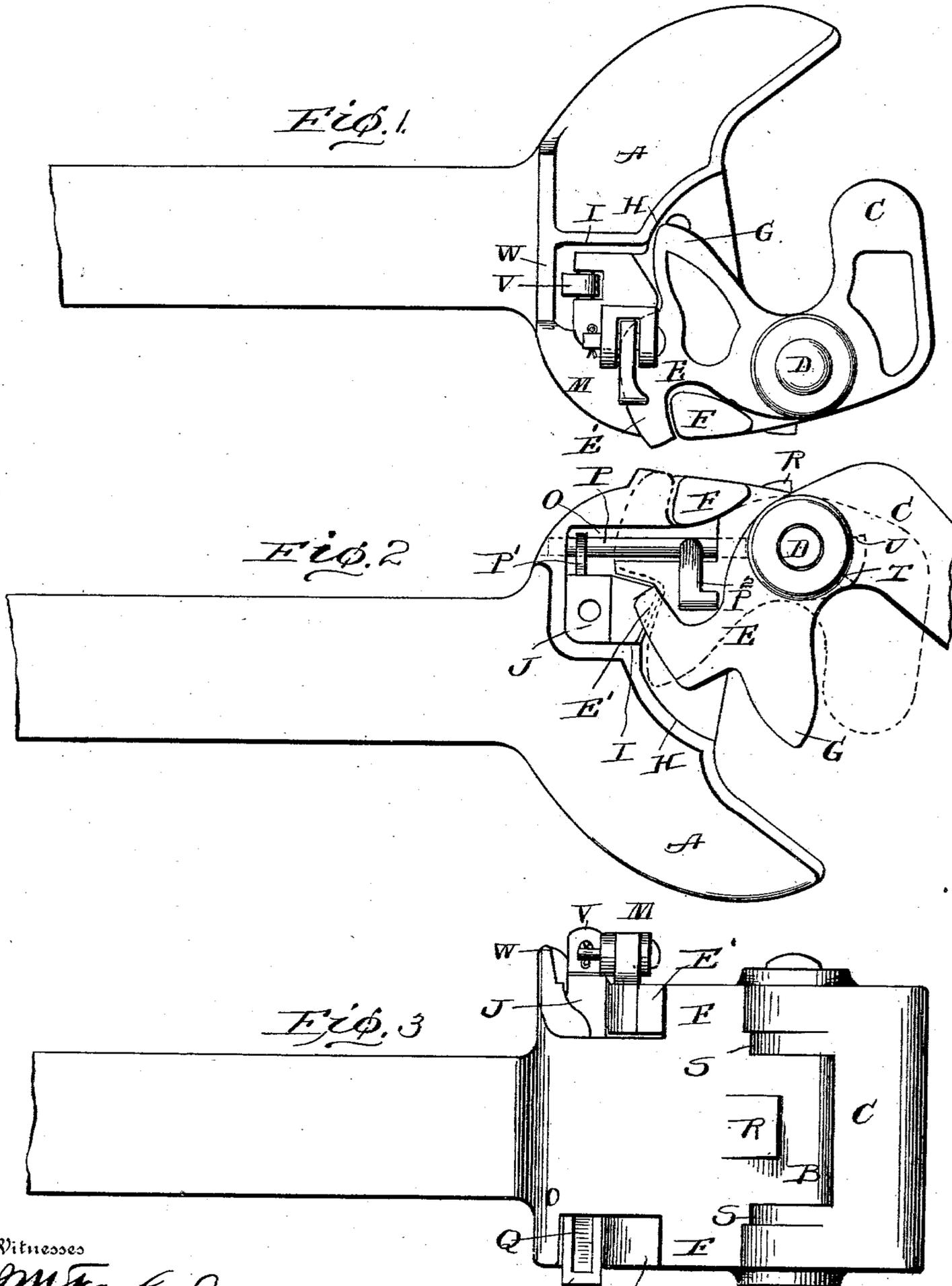
PATENTED NOV. 10, 1903.

J. W. SMITH.  
CAR COUPLING.

APPLICATION FILED JULY 17, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
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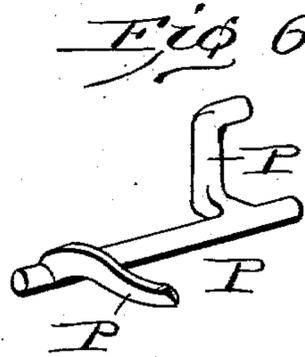
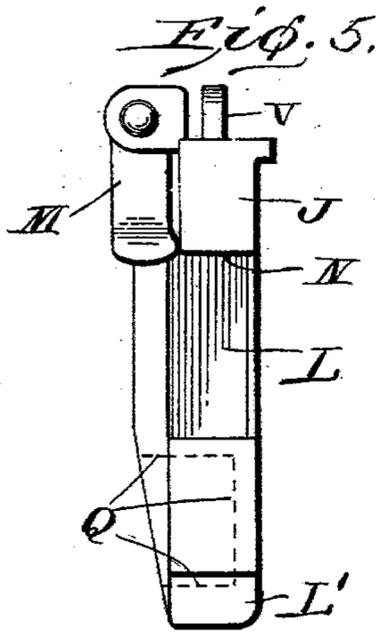
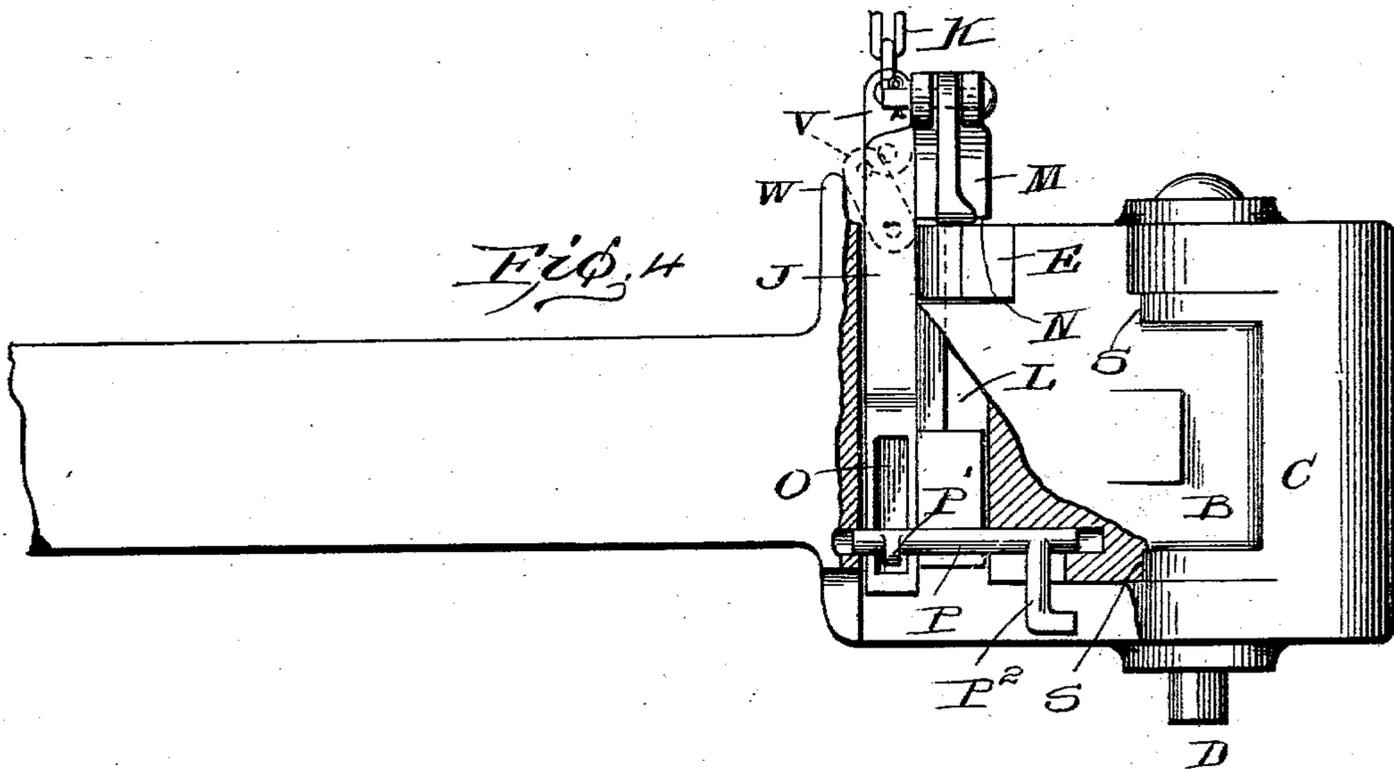
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Witnesses

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By

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# UNITED STATES PATENT OFFICE.

JOHN WORTHINGTON SMITH, OF OTTAWA, CANADA.

## CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 743,767, dated November 10, 1903.

Application filed July 17, 1903. Serial No. 165,987. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WORTHINGTON SMITH, a citizen of the United States, residing at Ottawa, in the county of Carleton, Ontario, Dominion of Canada, have invented new and useful Improvements in Car-Couplers, of which the following is a specification.

This invention relates to couplers of the Master Car-Builders' type, and in outline and in general features it is not greatly unlike other couplers of this class.

The object is to provide improved means for locking, unlocking, and opening the coupler, for relieving the knuckle-pin from strain and wear, to hold the cars securely coupled should the coupling-pin be broken or removed, to adapt the coupler to resist more safely than most couplers the great strains of impact and of tractional force, and to secure certain other advantages which will hereinafter appear.

In the accompanying drawings, Figure 1 is a top plan view of the closed coupler. Fig. 2 is a bottom plan view of the open coupler. Fig. 3 is a side elevation looking toward the knuckle side of the coupler. Fig. 4 is a view similar to Fig. 3, parts being broken away. Fig. 5 is an elevation of a certain knuckle-locking block and its securing-pawl looking from the right in Figs. 1, 2, 3, 4. Fig. 6 is a perspective view of a certain rock-shaft having rigid arms and serving to force the knuckle open.

In the views, A represents the guard-arm of a coupler-head, and B a knuckle-receiving hub formed upon the opposite side of the head by cutting away the upper and lower portions of this part of the head, so that it may receive the bifurcated knuckle C, which is pivotally held by a pin D, passing through the hub and both branches of the knuckle. Each branch of the knuckle is provided with a rearwardly-extending tail E, whose free end forms an outwardly-turned hook E' in position to swing into and out of engagement with a heavy lug F as the knuckle is closed and opened. From the tail E an arm G projects obliquely rearward approximately to a shoulder H upon the head, and between each tail E and a shoulder I lies a locking-block J, which slides vertically in a way in the head, being raised and lowered by means of a chain K

or the like, operated in a well-known way from the top or side of the car. The locking-block is cut away at L L', so that when it is lifted to bring the cut-away portions into the planes of the knuckle branches, respectively, it no longer projects into the paths of the knuckle branches. A pawl M is pivoted to the upper part of the locking-block in position to lie normally in nearly horizontal position upon the upper branch of the knuckle, and when the locking-block is raised this pawl swings by gravity to vertical position and against the locking-block, as seen in Fig. 5, when it effectually prevents the descent of the locking-block when the latter is no longer held up by the chain. If now the knuckle be swung open, the upper branch slides beneath the end of the pawl, which cannot move with the branch, and soon passes from beneath the same, allowing the locking-block to descend slightly until its shoulder N rests upon the knuckle branch. When the knuckle swings again to closed position, its upper branch moves beneath the rounded end of the pawl, swinging it to oblique position, where it cannot support the locking-block, and then passes from beneath the shoulder N, when the locking-block instantly falls by gravity, locking the knuckle, as at the outset. Thus when the locking-block is raised, allowing the pawl to swing to vertical position, the locking-block cannot fall again until the pawl is swung outward by the movement of the knuckle or otherwise, and hence raising the locking-block whether or not the knuckle is opened at the same time, leaves the knuckle free to open if not already open, and so arranged that it will be automatically locked whenever it is closed.

In a recess O in the lower part of the head is a rock-shaft P, having a rigid arm P', projecting into a long vertical recess Q in the locking-block, and another arm P<sup>2</sup>, which normally lies approximately in the vertical plane of the shaft and alongside the lower knuckle branch in position to push the branch and open the knuckle whenever the shaft is properly rocked. The proportions are such that when the locking-block is raised far enough to free the knuckle, as shown in Fig. 4, the rock-shaft is not affected, the arm P', which was before near the the top of the recess, be-

ing now at the bottom of the same; but if the locking-block be further lifted, by the chain or otherwise, the bottom or lower side of the recess engages the arm P', rocks the shaft, and forces the arm P<sup>2</sup> against the lower knuckle branch, opening the knuckle. It is to be observed that the upper recess in the locking-block is of sufficient vertical extent to permit this raising and that the upper knuckle branch does not swing entirely out of this recess when the knuckle opens, and hence that the locking-block cannot be lifted farther than to bring the lower side of this recess into contact with the upper knuckle branch. It may be further noted that when the locking-block is fully raised the pawl rises from the knuckle, but remains pendent and allows the locking-block to descend freely, but not far enough to lock the knuckle. The bearings of the rock-shaft allow endwise movement of the latter in passing to place; but when this is in place the locking-block J, being inserted from above the arm P', enters the recess Q, and further sliding of the shaft is thus prevented. Putting the knuckle in place in turn prevents the withdrawal of the locking-block. The lugs F and the knuckle-hooks are preferably so arranged that when the knuckle is closed the hooks are in close engagement with the lugs, the meeting surfaces being curved about the axis of the knuckle-pin and inclined outwardly forward, so that tension upon the knuckle tends to maintain engagement. The strain and the wear upon the pin and the walls of the aperture in which it works are thus greatly decreased, the work being divided among the four points instead of between two points and the strength of the hooks and lugs reinforcing the strength of the pin. It is clear that so long as two coupled knuckles are prevented from opening by the locking-blocks J they cannot become uncoupled if one or both knuckle-pins be broken or removed, but will continue to securely couple the cars.

To limit the opening movement of the knuckle by devices which leave it entirely free to close, I provide upon the outer side of the head a lug R, and to limit the contrary movement and to share with the shoulders H and I and other shoulders S the great strain of impact I provide on the hub a vertical shoulder T, extending from top to bottom of the hub and coacting with a similar shoulder U within the knuckle. The shoulders S and T can hardly be broken, and they practically make the application of a breaking strain upon the tails and arms impossible.

Ordinarily when a draw-bar breaks loose and is drawn outward until freed from the devices which support it it falls to the ground, where it is nearly certain to engage the passing brake-beams, with the not infrequent result of derailing the train and causing very great loss. To obviate this evil, I attach the chain K not directly to the locking-block, but to a link V, itself pivoted to the locking-

block and normally lying just in front of a flange W upon the coupler-head. The parts are so proportioned and arranged that as the coupler is drawn out bodily the link V is pulled rearward by the chain K and at the same time drawn upward slightly, so that in assuming the position shown in dotted lines it acts as a lever, using the flange W as a fulcrum, and thus raising the locking-block out of locking position. This allows the knuckle to open, freeing the coacting coupler before the injured coupler is drawn out far enough to fall from its supports. It is true that uncoupling is not desirable; but it is to be borne in mind that uncoupling has already occurred through the supposed breakage and that this device simply avoids the most serious and imminent danger arising from the breaking.

What I claim is—

1. The combination with a coupler-head having on its upper and lower sides suitable projections, of a bifurcated knuckle pivoted upon the head and having hooked branches adapted to swing into and out of engagement with said projections, respectively, as the knuckle closes and opens.

2. The combination with a coupler-head having above and below suitable rigid projections, of a bifurcated knuckle pivoted to the head and having hooked branches adapted to swing into and out of engagement with said projections, respectively, as the knuckle closes and opens, and devices normally holding said hooked branches in engagement with the projection.

3. The combination with a coupler-head, of a bifurcated knuckle pivoted thereon, a vertically-moving locking-block normally obstructing the opening movement of both knuckle branches but passing out of obstructing position when raised above a certain point, automatic devices for holding the locking-block above such point when it has been raised, and means whereby further raising opens the knuckle; said devices being arranged to be thrown out of operation by closing movement of the knuckle.

4. The combination with the coupler-head having the projections above and below and the shoulder upon the periphery of its hub, of the bifurcated knuckle pivoted upon said hub and provided with a shoulder in position to meet said shoulder upon the hub when the knuckle is closed and with hooked tails in position to engage said projections, respectively, when the coupler is closed, a locking-block sliding into and out of position for locking the knuckle, and means for operating the locking-block.

5. The combination with a coupler-head and a bifurcated knuckle pivoted thereon, of a locking-block movable in the head into and out of knuckle-locking position, a rock-shaft mounted in the head and provided with an arm in position to exert opening force upon the knuckle as the shaft is rocked in the proper direction, and means whereby moving

the locking-block in unlocking direction so rocks the shaft.

6. The combination with a coupler-head, a knuckle pivoted thereon, and a locking-block  
5 arranged to move upward and downward in the head and to release the knuckle when raised, of a rigid link pivoted to said locking-block at a point below the rearwardly-adjacent portion of the head, and devices con-  
10 necting the upper end of said link with some portion of the car, substantially as set forth;

whereby the relative advance of the head may cause the link to act as a lever and lift the locking-block.

In testimony whereof I have signed my 15 name to this specification in the presence of two subscribing witnesses.

JOHN WORTHINGTON SMITH.

Witnesses:

GEO. W. CAYE,  
I. J. LYATOR.