

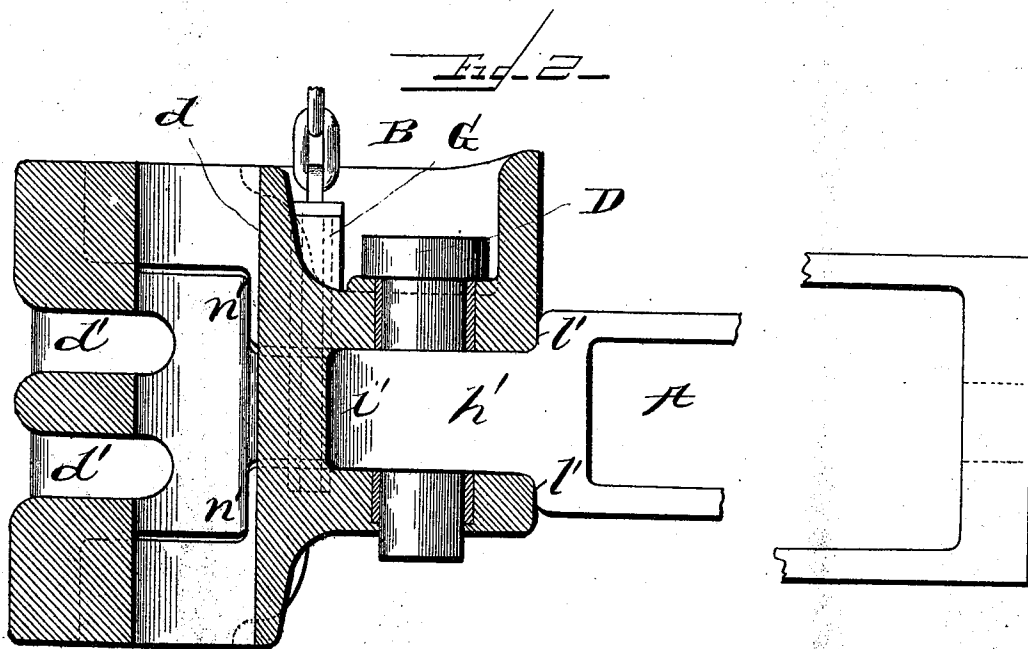
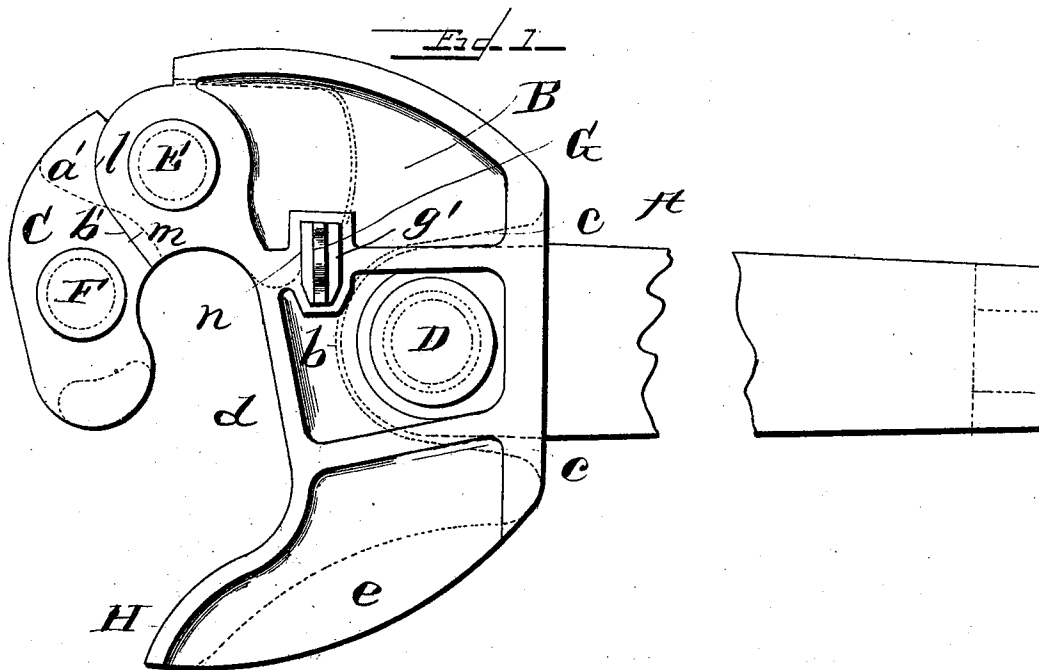
(No Model.)

4 Sheets—Sheet 1.

J. COUP.
CAR COUPLING.

No. 519,105.

Patented May 1, 1894.



Witnesses
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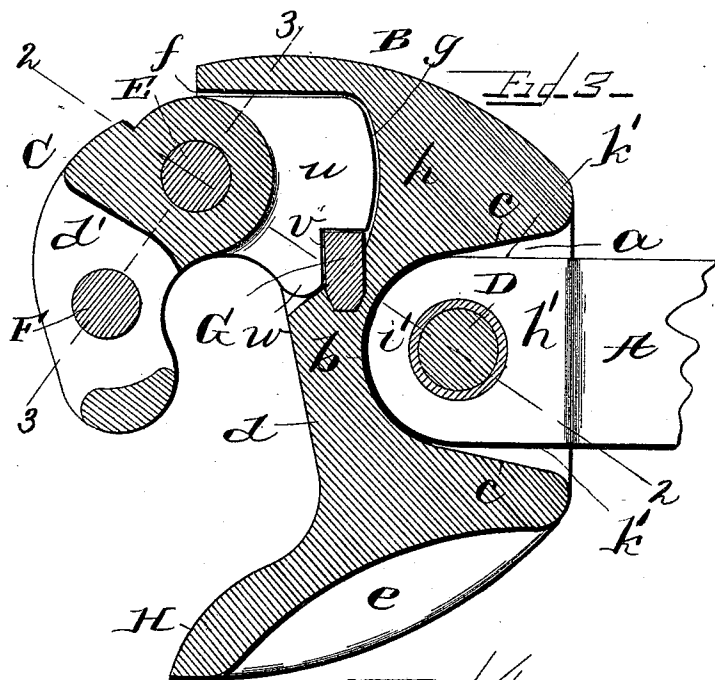


Fig. 3-

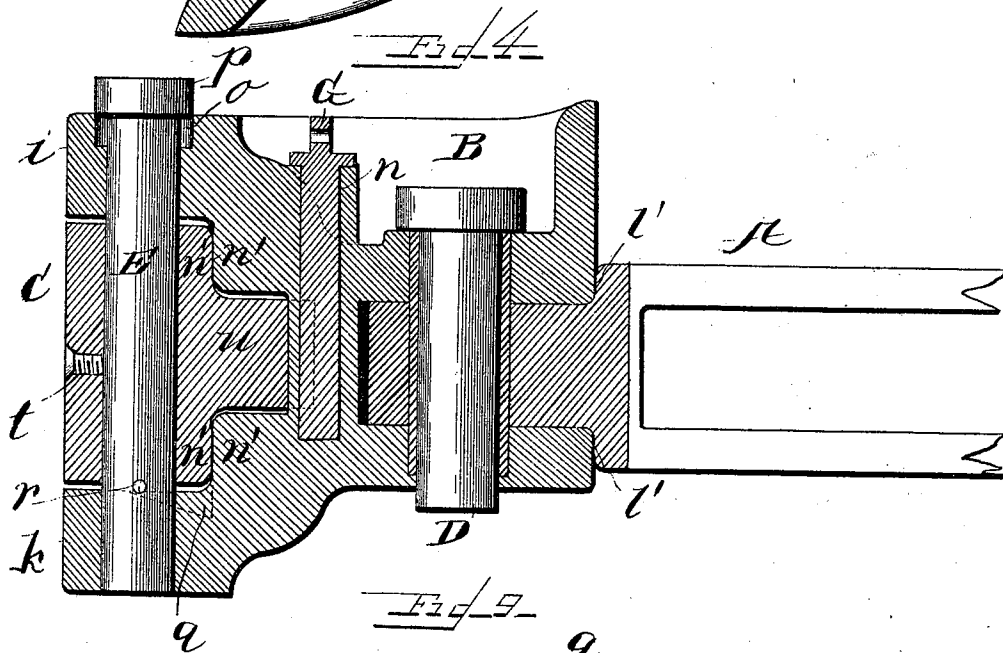
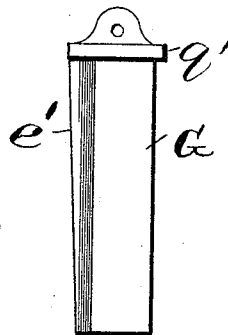
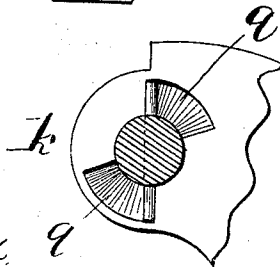


Fig. 4-



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Fig-5-

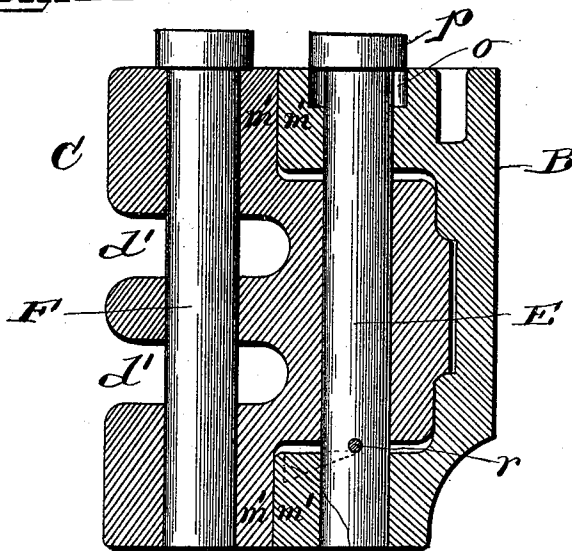


Fig-6- 9

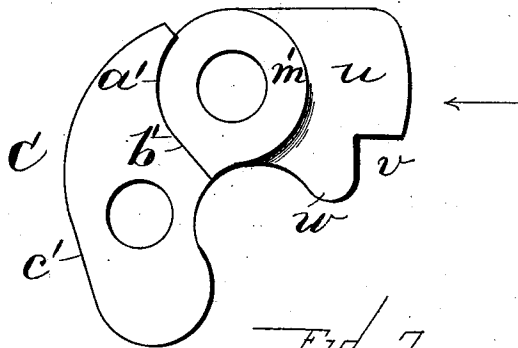
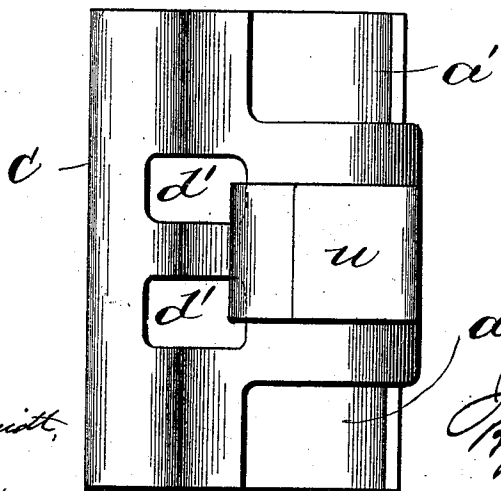


Fig-7-



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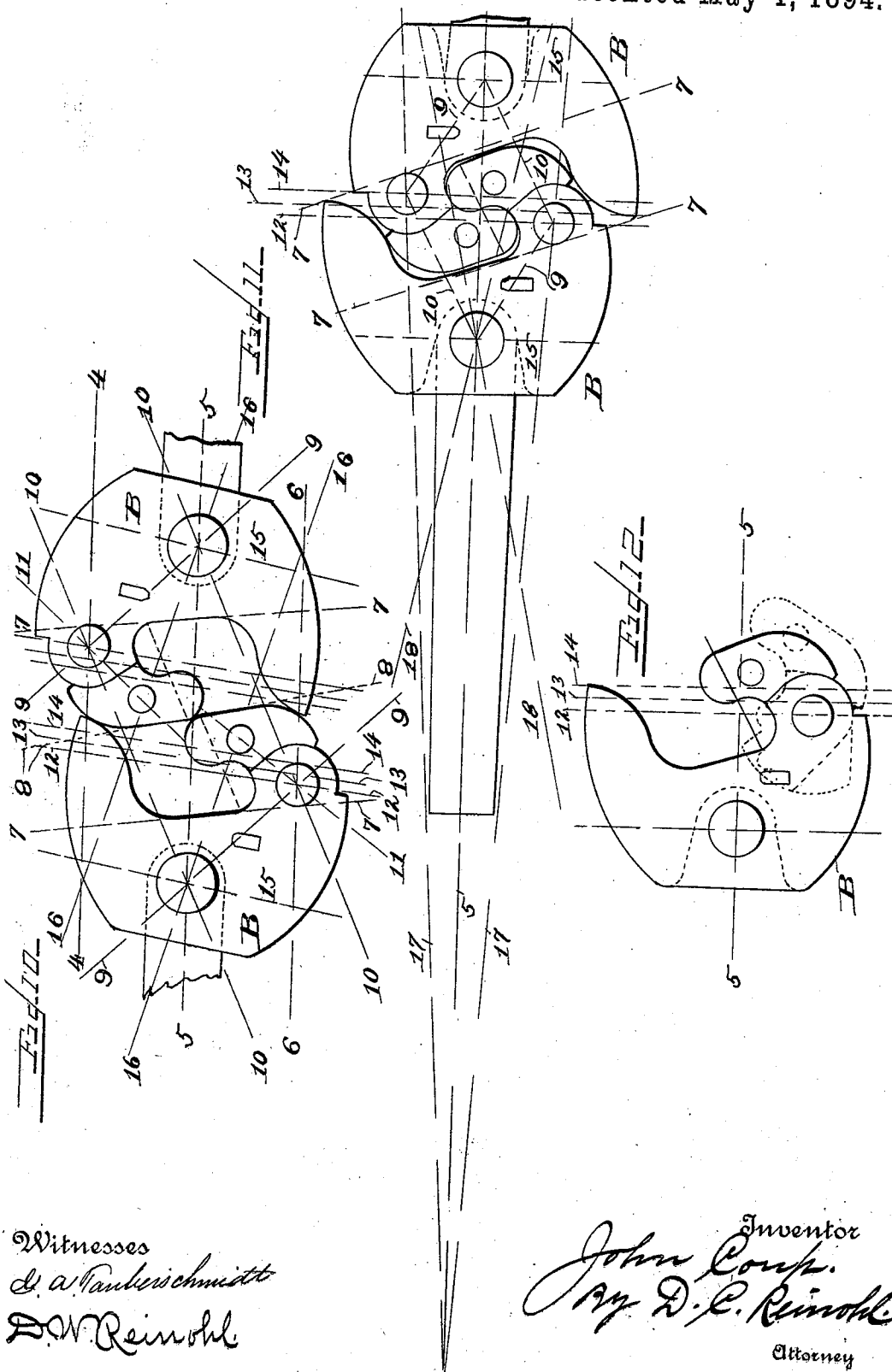
(No Model.)

4 Sheets—Sheet 4.

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UNITED STATES PATENT OFFICE.

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CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 519,105, dated May 1, 1894.

Application filed August 22, 1893. Serial No. 483,758. (No model.)

To all whom it may concern:

Be it known that I, JOHN COUP, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Car-Couplings; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to car couplings, has especial reference to that class of couplers designated "vertical-hook" or "twin-jaw," and has for its object certain improvements in construction whereby the strength and durability of the coupler are greatly increased.

The invention will be fully disclosed in the following specification and claims.

In the accompanying drawings which form part of this specification Figure 1 represents a top plan view; Fig. 2 a vertical longitudinal section through the transverse center of the coupler-head showing the draw-bar and draft pin in side elevation; Fig. 3 a horizontal section on the line 1. 1. Fig. 2; Fig. 4 a vertical section on line 2. 2. Fig. 3; Fig. 5 a vertical section on line 3. 3. Fig. 3; Fig. 6 a top plan view of the hook or knuckle detached; Fig. 7 an end view of the hook or knuckle looking in the direction of the arrow in Fig. 6; Fig. 8 a side view of the locking pin detached; Fig. 9 a top plan view of the inner face of the lower lug of the knuckle-jaw; Fig. 10 a top plan view on a reduced scale of a pair of coupler heads uncoupled and in position for "shunting" cars; Fig. 11 a like view of a pair of coupler-heads coupled, and Fig. 12 a like view of one coupler-head detached.

In the practical use of the class of couplers to which my invention relates the weak points have developed and breakage resulted in the guard-arm, the pin holes, the lugs of the knuckle-jaw, the knuckles and the shanks in the order of their enumeration, and with these facts in view the construction herein shown has been carefully and studiously devised to strengthen these several parts.

Reference being had to the drawings and the letters and figures thereon, A, indicates

the draw-bar, B, the coupler-head, C the hook or knuckle, D the draft-pin, E the hook pivot-pin, F the link-pin, and G the pin or key for locking the hook in position when coupled with another hook and coupler.

In the rear end of the coupler-head B is a recess or seat *a* having a curved end wall *b* and angular side walls *c c*, all of which walls are vertical, and in front of the recess is a solid body of metal on the outer surface of which is the contour-face or wall *d* which extends from the outer end of the guard-arm H to or beyond the transverse center of the head, and from the upper side to the lower side of the head, as shown in Figs. 2 and 3. This solid wall or body of metal in front of the recess *a* takes part of the shock when two couplers are brought together forcibly in the act of coupling and furthermore adds great strength to the head. The guard-arm H is also solid and is further strengthened by ribs *e*, of which two or more are provided. On the opposite side of the transverse center of the coupler-head is a recess *f* which is provided with a curved rear wall *g* and in the rear of said recess is a solid body of metal *h* to take part of the shock in shunting cars when the hooks or knuckles are closed, as shown in Fig. 10. This solid body of metal prevents crushing of the head when cars are brought together with great force, as frequently occurs in other forms of heads. The knuckle-jaw is provided with an upper or top lug *i* and a lower or bottom lug *k*, between which lugs the hook C is inserted and pivotally secured thereto by the pivot-pin E. On the front end of the lugs *i k* are bearing surfaces composed of a curved portion *l* and a resisting surface *m* which is preferably angular and at an angle of about forty-five degrees to the axis of rotation of the hook, and in the front wall of the head is an elongated recess *n* to receive the pin or key G to lock the hook C when coupled. In the upper surface of the lug *i* is a recess *o* to receive the head *p* of the pin E, and on the inner surface of the lug *k* is an oppositely inclined seat *q* as shown in Figs. 4, 5 and 6, upon which seat rests a pin *r* which passes transversely through the pivot-pin E and upon which pin *r* and the seat *q* the hook swings out of the head B automati-

cally when released by raising the locking pin or key G and is placed in position for coupling.

The hook or knuckle C is secured to the 5 pivot-pin E by any suitable means such as a set-screw *t*, as shown in Fig. 4, or by its equivalent means, such as a seat in the hook and a spline on the pivot-pin, and is provided with a rearwardly extending tongue *u* which enters the recess *f* in the front end of the coupler-head and the rear end of said tongue bears against the rear wall *g* of said recess to take the shock or thrust of shunting cars. In the front edge of the tongue *u* is a recess *v* which 10 engages the inner end of the pin G to take the strain off the pin E when drawing a car; and forming one side of the recess *v* is a projection *w* which is struck by the hook of an adjacent coupler when the two are brought together and gives the initial movement to the 20 hook. The pin G rests upon the tongue *u* when the hook is open, as shown in Fig. 12 and falls into the recess *v* as soon as the hook has assumed its proper position to couple. The pin or key G having its inner end resting against the front wall of the head and the thrust being against the pin transversely of the head there is no possibility of crushing the wall of the recess. On the hook C are curved and resisting 30 surfaces *a'* *b'* which correspond with the surfaces *l*, *m*, on the front end of the lugs *i* *k* on the knuckle-jaw, and on the front end of the hook is a flat angular surface *c'* to form a contact or bearing surface when the hook is brought into contact with another hook to couple, and the angular or inclined surface causes the hooks to slide over each other freely and assume the position for shunting shown in Fig. 10. In the front end of the hook are two 40 link-slots *d'* *d'* which are surrounded by a continuous wall of metal to prevent the breaking of this part of the hook, and vertically through said opening passes the link-pin F. The pin G is tapering on its front edge *e'* as shown in Fig. 8 and the inner wall of the recess *n* which receives the pin must be correspondingly tapered to automatically take up wear and lost motion as the pin or key descends in the recess. The flange *g'* 50 around the upper end of the pin prevents snow, ice, or dirt entering the recess *n*.

The draw-bar A is provided with a head *h'* on its front end the end *i'* of which head is rounded to correspond with the curved wall 55 *b* of the recess *a*, and with parallel sides *k'* *k'*, and in the rear of said head are shoulders *l'* *l'* against which the inner end of the coupler-head rests or bears, as shown in Figs. 2 and 4 and form a "dead-wood" for the coupler. The head B is pivotally connected to the head *h'* of the draw-bar by the draft-pin D and vibrates laterally thereon to an angle of about twenty-three degrees whereby cars may be coupled and uncoupled while upon 60 any curve in a road-way and may even be coupled and uncoupled upon compound curves, the greatest degree of flexion required

being not more than thirty-six degrees, while my coupler provides twenty-three degrees in each coupler or a total of forty-six degrees. 70 The draft-pin D is provided with a bushing *m'* which may be renewed as it wears.

The draw-bar is claimed in another application for a patent filed herewith, Serial No. 483,759, and need not therefore be more fully 75 herein described.

The coupler constructed as shown and described consists of three pieces, namely, the draw-bar A, the coupler-head B, and the hook or knuckle C, and provides twenty-eight sur- 80 faces upon which the shock of two couplers brought forcibly together is distributed, as follows: four upon the inclined faces *c'* of the hook C and the contour faces *d* of the head B, four upon the bearing surfaces *l*, *m*, *a'*, *b'* on 85 the front end of the knuckle-joint, four upon the rear end *m'* of the knuckle-joint, four at the bearings *n'* between the upper and lower lugs *i* *k* of the knuckle-joint, four at the rear ends of the tongues *u* and walls *g* in the recesses *f*, four at the bearings between the curved end *b* of the seat *a* and the end of the head *h'* of the draw-bar A, and four at the shoulder *l'* on the draw-bars. The draft strain is distributed upon twelve surfaces as fol- 95 lows: two on the inner surfaces of the hooks or knuckles C, two on the hook pivot-pins E, two on the tongues *u* and the pin G, two on the inner or inclined edge of said pin G and the inner wall of the recess *n*, two on the draft 100 or coupling-pin D, and two on the usual tail-bolt (not shown). By this distribution of the shock and the draft, no part of the coupler is subjected to excessive strain and the maximum degree of strength and durability is se- 105 cured.

In Fig. 10, the shunting lines 4, 5, 6, are shown in parallel planes, the line 5 being also the center or draft-line in the construction. In this position of the heads B, they have 110 swung upon the draft or coupling-pins D and assumed angles in opposite directions, the lines 7, 7, representing the contour-lines on the contour-face of each head B, and are at an angle of about eighty-five degrees to the 115 center or draft-line 5, and the line 8 representing the buffing line between the surfaces *c'* on the hooks C and are at an angle of about eighty degrees to the center or draft line. The end guard-lines 9, 9, extending from the 120 center of the draft or coupling-pin D to the center of the hook pivot-pin E in the same head are at an angle of about sixty-two degrees to the center draft line and parallel to each other, and the side guard-lines 10, 10, 125 extending from the center of the draft or coupling-pin in one head to the center of the hook pivot-pin in the other head are at an angle of about seventy degrees to the draft-line and parallel to each other. The guard- 130 lines 11, 11, extending from the center of the hook pivot-pin E to the center of the link-pin F in each coupler are at an angle of about seventy degrees to the draft-line. Lines 12, 13,

14, in the center and 15, 15, near the ends are construction-lines and are parallel to each other and lines 16, 16, are guard-lines to the shunting-lines 4 and 6 and are at an angle of about seventy degrees to the draft-line and pass obliquely through the guard-arm H.

In Fig. 11 lines 17, 17, are strain-lines and at an angle of about twenty degrees which extend through the center of the hook pivot-pins, and lines 18, 18, curve-lines at an angle of about twenty-three degrees to the center or draft-line and focus in the center of the coupling-pin; and the walls *c, c*, of the recess *a* in the rear end of the coupler-head are of the same angle, twenty-three degrees, as indicated in said Fig. 12. In this coupled position of the couplers the guard-lines 9, 9, 10, 10, change their angles of inclination so that each line represents an angle of about forty-five degrees to the line 5, and form a figure substantially a rectangle.

The construction-line 21 in Fig. 12 furnishes the points of radii for the end of the hook C and the inner end of the contour-line *d*, and the compound curved line formed thereby is substantially in the form of the letter S, the high point at the junction of the two reverse curves on the inside of the hook being the point of grip or contact in pulling and prevents slipping of the hooks.

It will be observed that all the guard-lines are directed through the most solid and therefore rigid parts of the coupler to afford the greatest resistance to strains in drawing or shunting, and that when the hooks C are coupled there is no friction on the impinging surfaces of the hooks in drawing or in rounding curves in the road way; for the reason, the heads B swing laterally upon the pins D and transfer the wear to the pins D and their bushings.

Having thus fully described my invention, what I claim is—

1. A car coupler-head having a recess or seat provided with curved and angular walls in the rear end of the head the angular walls limiting the lateral movement of the head and a solid wall in front of said recess, in combination with a draw-bar provided with a solid head on its front end to engage the curved walls of said recess.

2. A car coupler-head having a recess or seat provided with curved and angular walls in the center of the rear end of the head the angular walls limiting the lateral movement of the head and a solid wall in front of said recess, in combination with a draw-bar having a solid head in the center on its front end constructed to engage the curved wall of said recess.

3. A car coupler-head having a recess or seat provided with curved and angular walls in the rear end of the solid head the angular walls limiting the lateral movement of the head and a solid wall in front of said recess, in combination with a draw-bar provided with a solid head constructed to engage the curved

wall of said recess and shoulders in rear of the head against which the coupler-head bears.

4. A car coupler-head having a recess or seat in the rear end of the head provided with curved and angular vertical walls which angular walls limit the lateral movement of the head and a solid wall in front of said recess; in combination with a draw-bar provided with a head having a rounded end and parallel sides and shoulders in rear of the head on the upper and lower sides of the bar.

5. A car coupler-head having a recess or seat provided with curved and angular walls in its rear end, which angular walls limit the lateral movement of the head a solid contour-face or wall in front of said recess and extending from the guard-arm to or beyond the transverse center of the head; in combination with a draw-bar having a solid head on its front end constructed to engage the curved wall of said recess.

6. A car coupler-head having a recess or seat in its rear end, a solid contour-face or wall in front of said recess and extending from the outer end of the guard-arm to or beyond the transverse center of the head and provided with a recess in the knuckle-jaw and in the head; in combination with a draw-bar and a hook.

7. A car coupler-head having a recess or seat in its rear end, a solid contour-face or wall in front of said recess and extending from the guard-arm to or beyond the transverse center of the head and provided with a recess in the knuckle-jaw and in the head, and a solid body of metal in rear of said latter recess; in combination with a draw-bar and a hook.

8. A car coupler-head having a recess or seat provided with curved and angular walls in the rear end, which angular walls limit the lateral movement of the head and a recess in the front end on one side of the transverse center of the head, and a hook pivoted to the knuckle-jaw of the head and provided with a rearward extension or tongue to swing in the latter recess; in combination with a draw-bar having a solid head on the front end constructed to engage the curved wall of said recess and a pin to lock the hook.

9. A car coupler-head having a recess on one side of the transverse center of the head to receive the tongue of the hook and a solid body of metal in rear of said recess; in combination with a hook pivoted in the knuckle-jaw with the rear end of the tongue abutting the rear wall of said recess.

10. A car coupler-head having a recess on one side of the transverse center of the head, a hook pivoted to the knuckle-jaw of the head and provided with a tongue extending into said recess; a vertical recess in the contour-wall in combination with a pin adapted to said recess and supported upon said tongue when the hook is unlocked and in position for coupling.

11. A car coupler-head having a solid con-

tour-face or wall extending from the outer end of the solid guard-arm to or beyond the transverse center of the head and from its upper to its lower side; in combination with
5 a hook.

12. A car coupler-head having a solid contour-face or wall extending from the outer end of the guard-arm to or beyond the transverse center of the head and from its upper
10 to its lower side and provided with a recess in the opposite side of the head to receive the tongue of a hook.

13. A car coupler-head, a hook pivotally secured to the head and provided with a rear-
15 wardly extending tongue, and a vertical recess in the contour-wall of the head; in com-

bination with a pin having an inclined edge to automatically take up wear and lost motion.

14. A car coupler-head having a recess in the upper surface of the upper lug of the
20 knuckle-jaw and an inclined seat on the inner surface of the lower lug of the jaw; in combination with a pivot-pin connecting the hook to the knuckle-jaw and provided with a transverse pin to rest upon said seat, and
25 said hook secured to said pivot-pin.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN COUP.

Witnesses:

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