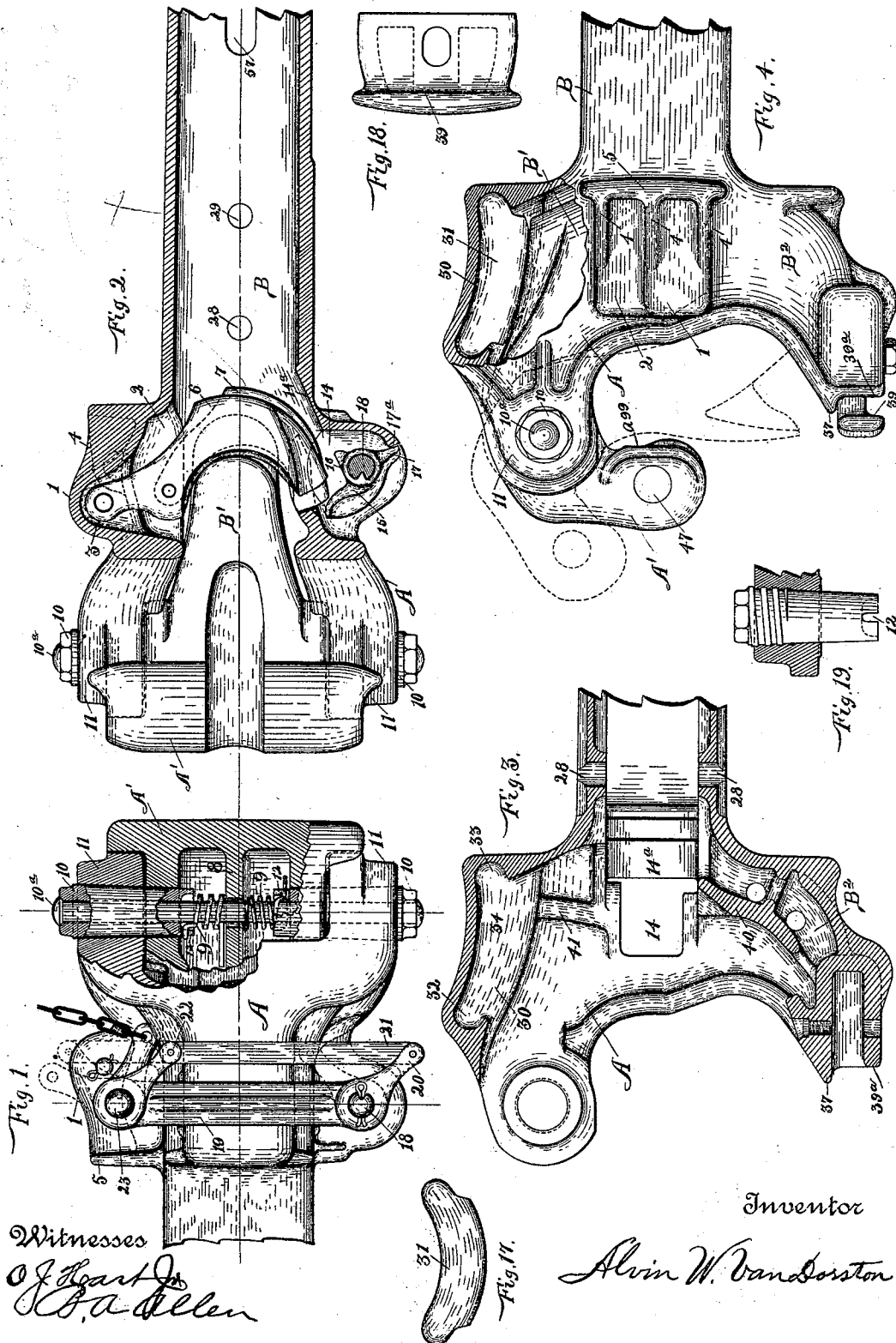


A. W. VAN DORSTON.
CAR COUPLING.

No. 517,179.

Patented Mar. 27, 1894.



Witnesses
J. Hart
C. A. Allen

Inventor

Alvin W. VanDorston

(No Model.)

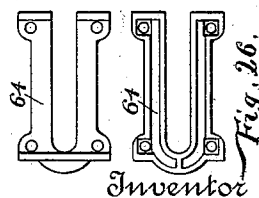
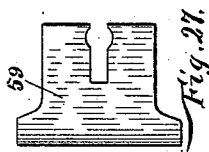
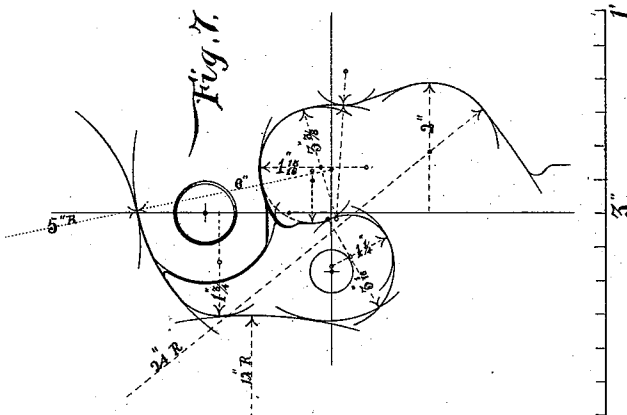
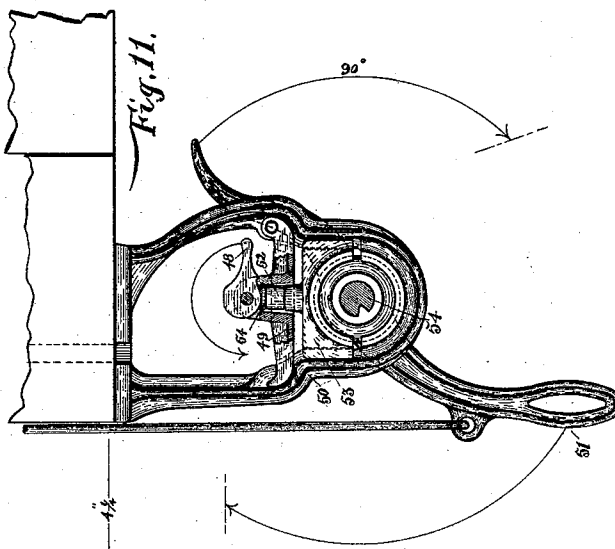
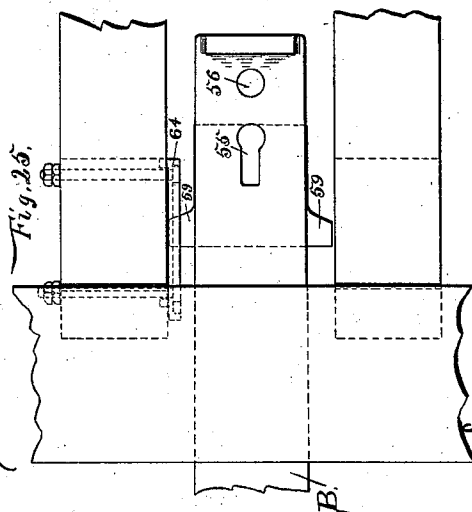
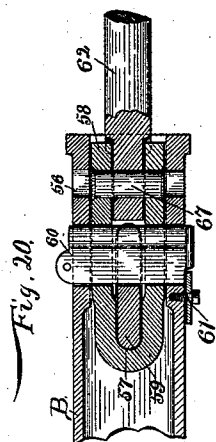
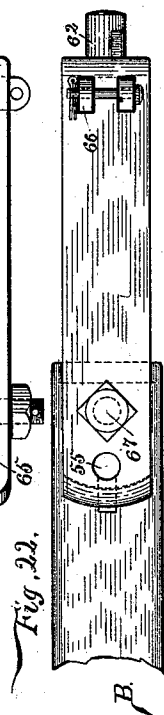
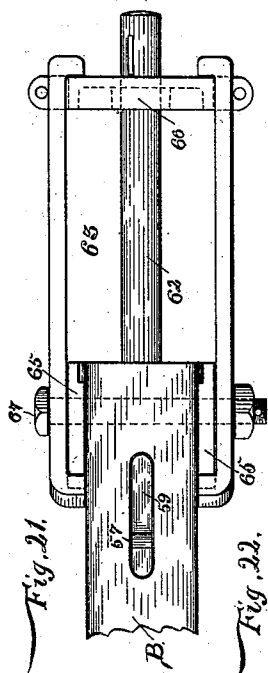
3 Sheets—Sheet 2.

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Witnesses
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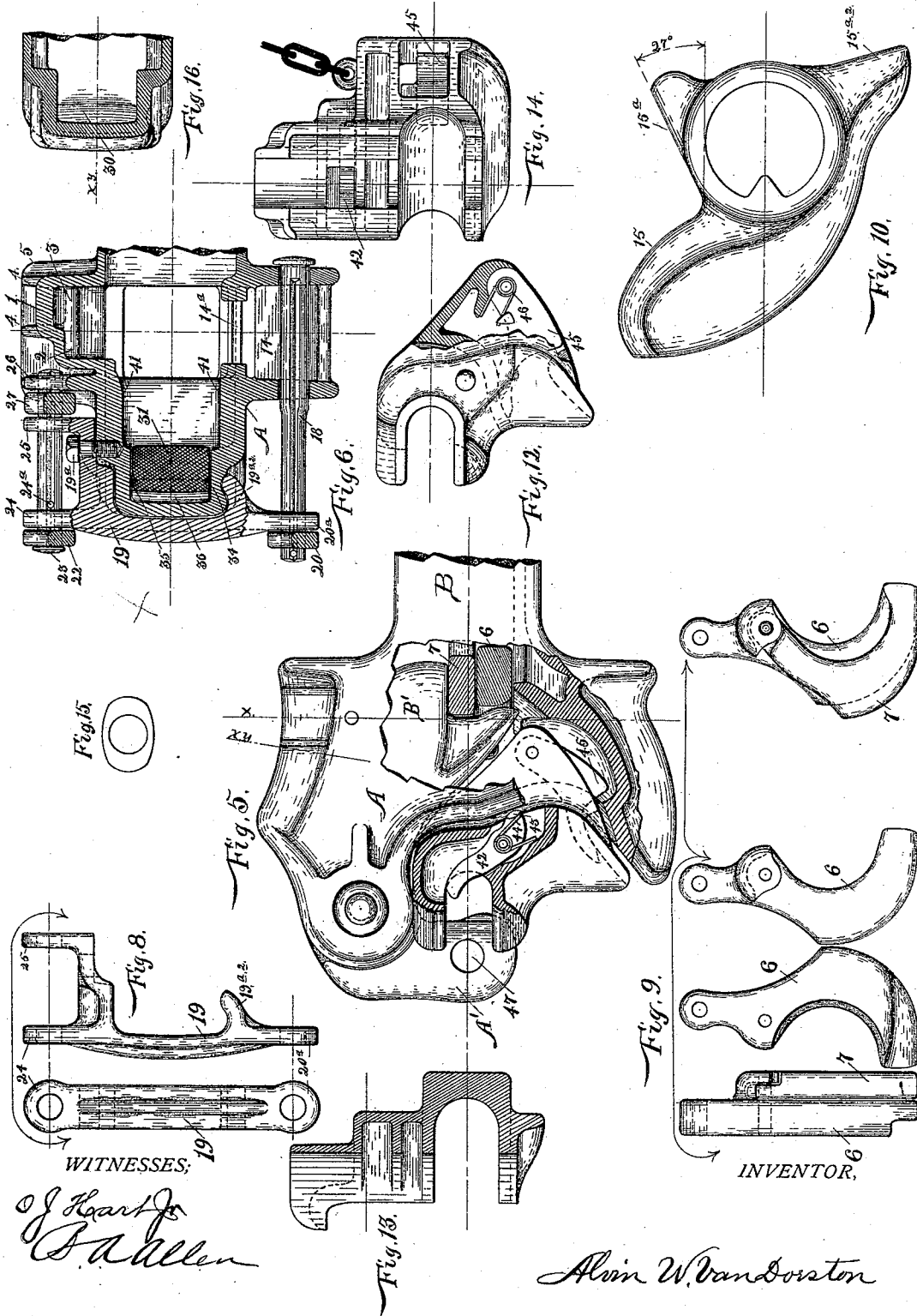
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3 Sheets—Sheet 3.

A. W. VAN DORSTON.
CAR COUPLING.

No. 517,179.

Patented Mar. 27, 1894.



UNITED STATES PATENT OFFICE.

ALVIN W. VAN DORSTON, OF WASHINGTON, DISTRICT OF COLUMBIA.

CAR-COUPLING.

SPECIFICATION forming part of Letters Patent No. 517,179, dated March 27, 1894.

Application filed January 27, 1892. Serial No. 419,441. (No model.)

To all whom it may concern:

Be it known that I, ALVIN W. VAN DORSTON, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Automatic Cushioned Car-Couplings; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My present invention relates to cushioned automatic car couplings of the twin jaw type (or more generally termed the master car builders' type), which consists of sundry improvements, the cushioned features of which particularly relate to the Perry patent, No. 310,720, and my application filed July 11, 1891, Serial No. 399,176.

This invention relates also to improvements in the construction of the entire coupler such as adapted to the use of seven or more changes of locks, any of which may be uncoupled by the same mechanism which may be operated from the top or the bottom side of the bar, and which coupler is also provided with new means of automatically opening the knuckle, and particularly adapted for rough usage without getting out of order, occurring in the devices heretofore employed for the purpose.

Other improvements consist in securing the knuckle in the bar and in the fastenings of the rear end of the bar. Also new features in uncoupling mechanism.

Further novelties consist in the combination and arrangement of the coupler and automatic mouth block serving to couple with the pin and link type without danger to trainmen, and preventing damage to the improved type of couplers by pulling out the front face of the jaws, all of which will hereinafter be more fully described and pointed out in the claims.

In the accompanying drawings, forming a part of this specification, the figures and letters of reference indicate like parts of my invention.

Figure 1 represents a longitudinal and jaw

side elevation of my improved coupler and uncoupling mechanism in form of a bracket secured to the side of the draw-head, which may be used with the top side uncoupling devices, and also represents a portion of the upper bar lug and the back wall of the knuckle broken out, exposing to view the tapered bushings serving as pivot bearings in securing the knuckle in the bar head and the arrangement of the internal coil or torsion springs therewith for rotating the knuckle into an open position when released from a closed and locked position. Fig. 2 is a longitudinal and section view as it appears looking from the guard arm side, representing the bar head with an improved form of hood and abutment combined, and having secured therein a compound swinging lock pivoted at its upper end, and which serves to lock the knuckle in a closed position, and which view also shows the rear end of the knuckle arm rounded in form suitable to the hollow of the locks. Fig. 3 is a bottom half section of the draw bar head representing the interior construction of the same, and having a T-shaped opening through the bottom side and combined with an incline adapted to the use of three different constructions in locks, either of which may be used in a single, double, triple or more forms, thus adapting the same bar to the use of any style of lock which may be selected. In the guard arm is provided a pocket and walls, which are adapted to the use of a buffer having a stop shoulder on its outer side and front end. Fig. 4 is a top plan view of the draw bar head having a portion of the upper wall broken out in the jaw side of the head, exposing to view the knuckle arm in a closed position and in contact with the india-rubber cushion of elliptic form as arranged in my new improved pocket, and which also represents the knuckle in dotted outline when in an open position. Fig. 5 is a top plan view of the coupler provided with my automatic mouth block having a section of the top wall broken out, showing a section view of the locks and the securing latch of the mouth block in position to retain said block in its relative position to the coupler head while in use. Fig. 6 is a vertical section of the draw head taken through the line x of Fig. 5, representing a half sectional view

of the side bracket as secured to the jaw side of the head, and which also shows the rock pins arranged with said bracket and the head. I may also arrange the bracket, 19, to operate upon the guard arm side, and which will be more fully described later on, also showing the cushion located in the left hand side of the figure within the pocket. Fig. 7 represents the contour lines to which the mouth and jaw of the couplers may be constructed, and consist of such curves and tangents essential to increase the life of the frictional and wearing parts in the lateral and vertical motion of the couplers while in transit in heavy and continued service. Figs. 8 are side elevations of the bracket removed from the bar head. Figs. 9 are rear and side elevations of the compound locks. Fig. 10 is a full size end view representing the construction and contour of the cam serving to simultaneously move the locks into an uncoupled position consisting of the several constructions. Fig. 11 is an inner side elevation of the hanger with improved form and adjusting device, whereby the same may be locked by means of friction upon the ball bearing or left free to resume the position shown when released from the hand without further attention on the part of the operator. Fig. 12 is a top plan view of the mouth block removed from the coupler partly shown in section. Fig. 13 is a vertical half section of same. Fig. 14 is a front elevation of same with chain attached for securing it to the car body. Fig. 15 is a modified form of mouth block which may be used in the mouth of the jaw, instead of the mouth of the bar. Fig. 16 is a section of the draw-head showing the pocket with the knuckle cushion removed. Fig. 17 is a top or bottom plan showing the shape and form of the cushion for use in taking up the shocks and momentum of the coupler heads and jaws. Fig. 18 is an outer side elevation of the buffer devised for the guard arm of my improved coupler; Fig. 19 a section of the bar head lug having a tapered bushing provided with a thread so that the same may be screwed into the bar lug, thereby giving double security to the same. Fig. 20 represents my improved draw-bolt fastenings shown in a longitudinal sectional view of the rear end of the bar stem. Fig. 21 is a longitudinal view showing my improved pocket and draw-bolt combined, both of which are allowed to move laterally from the same center or pivot point. Fig. 22 is a top plan view of same, the bottom side being the same. Figs. 23 are detached views showing the front and rear side of the pocket end plate. Fig. 24 is an inner face view of the plate used in connection with the pocket, as seen in Fig. 21, when applied to the bar. Fig. 25 is a top plan view of my improved method for preventing the bars from being pulled out and let fall upon the track and derail the train, should a pocket or draw-bolt become broken. Figs. 26 are views of brackets bolted to the

inside of the draft timber, as shown in Fig. 25. Fig. 27 represents the safety key removed from the bar, the extended points of which extend into the slot of the brackets in Figs. 25 and 26.

Referring to the drawings, A represents the draw-head proper, and B the stem, A' the knuckle nose, and B' the knuckle arm.

In my improved construction of the draw-head, A, it will be observed that a hood, 1, is provided on the upper side of said head, having two compartments, 2 and 3, within, and three ribs, 4, on its outer and upper surface which reinforce the hood and abutment wall, 5.

In the cavity, 3 (see Fig. 2), is pivoted the upper end of the main primary lock, 6, to which a second intermediate terminal lock, 7, is pivoted the two forming a compound lock (however, a greater number of locks may be used in connection with the main lock, if so desired), suitable to the construction of the curved form of the locks. It will be seen that the extreme end of the knuckle arm, B', is formed to a true circle whose diameter is governed by the depth of the arm that may be used, and which arm is made hollow and having within an internal web, 8, as shown in Fig. 1, and extending rearward one-half the length of the arm from the pivot openings. Above and below the web, 8, are arranged coiled springs, 9, which are held in place by the bolt or rivet 10^a used to secure the pivot bearings, 10; in the lower ends of said pivot points slots or openings, 12, are provided (see Figs. 1 and 12,) in which one end of the spring operates while the other bears against the inner side of the outer walls of the knuckle, as shown by the longer ends of the springs in Fig. 1, the pivot bearings being stationary in the bar lugs, 11, and the knuckle rotating about the inner projecting points of the bushings, 10, permits the use of one or more internal springs, which may be given any tension desired by turning the pivot bearings or bushings around sufficiently to cause the knuckle to rotate into an open position as shown in the dotted outline of the knuckle in Fig. 4, and which may be done by means of a loop wrench made to fit the hexagon-shaped outer projecting ends of said pivot bearings, or by the use of a monkey wrench. In further reference to the pivot bearings, it will be observed that I may use the upper spring only and have the lower pivot bushing made with a square thread as shown, so that it may be screwed into the lower bar lug, the thread being cut or cored into the lug admits also of the use of the threadless pivot bearings, so that either may be used or which may be used vice versa. It will be seen also that the bar lugs, 11, in which the pivot bearings, 10, are secured, are made with their upper portion of less diameter, leaving that portion abutting against the knuckle shoulder projecting farther forward, and having a true circle for its abutting face described from the

center of the pivot bearing, and which circle is about one-third of the whole circle so described. By this construction of the lugs they can be properly annealed when the bars are made of malleable iron without over-annealing other portions of the bar.

Referring again to the locks, it will be seen that I have provided the lower side of the bar head with a pocket and opening, 14, and incline 14^a, in the opening 14 is located a cam, 15, having a flat surface, 16, and stop lug, 17, which rests against the stop wall 17^a, the cam, 15, being rotated toward the rear end of the bar, and to the arrow point, as shown in Fig. 2, by means of which the locks are moved rearward to an uncoupled position to release the knuckle arm, B', when the springs, 9, will cause the knuckle to rotate to the open position previously referred to. In the present construction it will be seen that the cam is located upon a rock-shaft, 18, similar to the one described in my application hereinbefore mentioned, *i. e.*, when using the under side connection from the side of the car. When using the top side connection, the bracket, 19, shown in Figs. 1 and 8 is secured to the bar head by means of a screw bolt, 19^a, and the hook 19^b at the lower end, as shown in Fig. 6. Upon the outer end of the underneath rock pin, 18, upon which the cam is located is secured a lever, 20, between the eye lug 20^a and spring cotter and a fixed U-shaped key in the opening of said lever, and corresponding with a groove the entire length of said pin, at the extended end of said lever, is secured a connecting bar, 21, extending to the upper lever, 22, which is secured upon the outer projecting end of the rock pin, 23, having a key and groove similar to the lower one. In the rock pin, 23, at the opposite side of the bracket lug, 24, is provided an opening, 24^a, through which is inserted a cotter to retain the said rock pin in place. On the inner end of the rock pin, 23, between the inner lug, 25, of the bracket, 19, and the rib, 26, of the draw-head is located a third lever, 27, to which is secured a chain or any other suitable means to connect it with the ordinary uncoupling devices still in use, or the chain may be connected with the lower lever, 20, and the levers, 22, 27, and the rock-shaft, 23, may be dispensed with.

In further description of my improved coupler, it will be seen that the knuckle may be secured in the bar head with the bearings as previously described, and that the rounded end of the knuckle arm adapts it to the use of the locks shown, and also to the use of those described in my application filed July 11, 1891, Serial No. 399,176, by a slight modification of the locking ends so that they will conform to the rounded end of the knuckle arm. The uncoupling cam, 15, (see Figs. 2 and 10,) is designed to operate with the several constructions, and by either means of uncoupling mechanism. Therefore, I provide the openings, 28 and 29, in my present construction of the bar stem for application of the several

constructions of locks. Other improvements in the construction of the bar consist in providing the bar with a pocket, 30, having new and valuable features, as well as the cushion, 31, operating therein. In the design of the pocket it will be seen that the two ends are formed with extended sub pockets, 32 and 33, and that the top and bottom surfaces, 34 and 35, are made plain, as shown in Figs. 3 and 6, and that the cushion adapted to operate in said pocket is made elliptical in form and easily placed into position by springing the two ends nearer together sufficient to insert it into the pocket, and when released will fill the pocket in the manner shown in Fig. 6, and which leaves a space between the center portion of the cushion and the outer wall, serving also as a partial air cushion and when the knuckle arm is brought in contact with the cushion the recess, 36, is first taken up by pressure of the back portion of the knuckle arm adapted to enter the pocket, and, as indicated by the dotted outlines and position of the cushion in Fig. 4, by this means and the operation of the cushion the knuckle arm is absolutely prohibited from striking any portion of the walls of the draw-head, thus preventing any damage on the part of the knuckle arm or pocket.

Heretofore the construction of cushioned couplers and the application of the cushion shown in the previous patents have not been ample to prevent the knuckle arm from coming in contact with the walls of the bar after slight compression of the cushions.

In the improved construction of the guard arm, it will be seen that it is made shorter than heretofore and provided with a projecting lip, 37, and that the buffer, 38, shown in Figs. 4 and 18 is provided with a shoulder, 39, on the outer side serving as a stop shoulder to the buffer against the force of the guard arm 39^a when the same has performed its function, and which may be secured in the pocket in which it operates by means of a thread bolt or rivet, as shown in Fig. 3. Said guard arm is also provided with a secondary wall, 40, similar to my application previously referred to as a reinforcement to the lock mechanism.

41 represents guide ribs to the knuckle arm, B', and always bringing said arm in contact with the cushion located in the pocket, as shown in Figs. 3 and 6.

Referring to Figs. 12, 13 and 14, it will be observed that I provide an automatic mouth block having a trip dog, 42, which projects into a U-shaped opening for the reception of a coupling pin which rests upon the end of said dog, the link entering through the mouth of the jaw forces said block back against the mouth wall of the bar, which permits the opposite end, 43, of the trip dog to come in contact with the wall and cause it to rotate, throwing the other end from under the pin, thus leaving the pin to drop through the link, making the connection between the link type and

the improved type without danger to trainmen. The spring, 44, is employed to retain the dog in the position shown when the pin is removed. The latch, 45, is also provided with a spring, 46, which retains the latch in the position shown in Fig. 5, which secures the device in the mouth of the bar, and when in use with the link type the pulling strain is against the inner face of the jaw nose, thus preventing damage to the knuckle by pulling out the front faces of the jaws. (However, the mouth block may be used without the trip dog, 42, with much safety and advantage over the present method employed.)

When using the couplers to couple with their own kind, the mouth block is removed and may be secured to the car, or carried with the caboose to use in heavy traffic.

For light traffic and common service I have provided a simple mouth block shown in Fig. 15, which is used in the knuckle mouth to reduce the pulling strain to a sheer strain, thus preventing a pin of smaller diameter from being bent when used with the link, and adequate to the strength of the front face of the jaw when the opening, 47, is used. In the use of the latter mouth block, the link pulls against the block, instead of the pin, and the block against the pin.

In my present construction and improvements, in reference to Fig. 11, it will be seen that I employ a lever, 48, pivoted in the upper portion of the cross bar, 49, of the hanger, 50, the lever, 48, having an eccentric inner end so that the ball bearing can be left free from friction to assume the position shown, or that the friction may be applied by turning the lever over to the point designated by the arrow point, which will retain the hand lever, 51, for uncoupling, or to remain so at the point designated by the arrows in front and rear of the hanger by pressure of rubber, 52, or springs used located between the boss of the upper ball bearing, 53, and the metallic plate, 54, between the eccentric and spring. I may also employ a round uncoupling shaft, 54, instead of the square ones used heretofore. The contour lines shown differ somewhat from those shown and claimed in Patent No. 405,384, June 18, 1889, inasmuch as they consist in the front face of the jaw being slightly concaved in form which are better adapted to conform to the bottom wall of the bar head, thus enabling the couplers to operate upon much sharper curves. The inner face of the jaw being described from two circles of unequal diameter in reverse form intersecting a tangent, a^{99} , shown in Fig. 4 thus providing a combined rotary tread face jaw to take the place of the plain tread face shown in the patent above mentioned.

Referring to Fig. 20, it will be observed that the rear end of the bar stem, B, is provided with three openings, 55 and 56, are vertical openings, and 57 is a transverse opening, and within the bar end is arranged a clevis, 58 (which may be made of malleable iron or

wrought iron, but preferably of pressed wrought iron or steel), and which may be secured by either the key, 59, or the key, 60, or by both. The key, 60, may be inserted from the bottom side of the bar and secured by the plate and bolt, 61, or from the top side where there is room above the bar to insert the same and secured by means of a spring cotter.

The transverse key, 59, as will be seen, serves two purposes; first, in securing the clevis in the bar, and, second, to prevent the bar from pulling out of the car, should the draw-bolt, 62, or the pocket, 63, become broken, in which condition the U-shaped brackets, 64, serve for the key to pull against, as shown in Fig. 25, located on the inside of the draw timber, but in which view I have shown but one secured in place.

In the construction of my improved pocket and draw-bolt combined, as shown in Fig. 21, the intervening plates, 65, have their inner ends formed to a radius described from the center of the opening, 56, and may be made of malleable or pressed steel. By this means the pocket, 63, and draw-bolt, 62, being secured at the same center, allow the bar to move laterally without undue strain upon the draft pocket or draw-bar in curve work or rapid transit. In the rear end of said pocket is secured a removable plate, 66, by the use of a cross pin and cotter inserted through the upper and lower ends; thus a pocket is formed of several parts, (the same, however, may be made in one part) which is simple in its construction, safe and easy of application, and should damage occur to any one part where the several parts are employed does not necessitate the renewal of the entire pocket, and which adapts the bar to the use of a draw-bolt only, secured by means of the pivot-pin, 67, or the bolt and pocket combined, by use of the bolt serving as a pivot to both, and also the use of the pocket in the absence of the draw-bolt.

I am also aware that in my improved method of securing the knuckles to the bars by means of tapered bushings for pivot bearings, and the means combined therewith for automatically opening said knuckles when the same are released from a coupled and closed position several other constructions not shown may be employed or used to attain the same ends, which may consist in the upper pivot bearing and the bolt extending through it made in one part and extending through the lower pivot bearing, and provided with a nut and nut lock at its lower end, in which construction the spring would be secured in an opening drilled into the shoulder similarly located to that shown in Fig. 1. I may also use the threaded pivot bearings in both bar lugs with a bolt of seven-eighths of an inch or one inch in diameter at its upper end the length of the pivot bearing, then made to a less diameter below said bearing, so that the upper end of said spring may be secured in a slot made in the side of said bolt, and which

bolt extends down through the lower pivot bearing with a nut and lock on its lower end, which would permit the bolt to be adjusted to give tension to the spring without any movement of the bushing after the same have been permanently set in the bar lugs, the bolt thus serving to hold the spring in proper relation to the knuckle and to also serve as the tie bolt to the pivot bearings and bar lugs. I may also use a plain upper pivot bearing and bolt made as one part previously described and use a threaded pivot bearing in the lower bar lug and use in connection therewith the upper torsion spring only, thus simplifying the method of construction and application.

Having thus fully described the new and useful functions pertaining to my invention, what I desire to secure by Letters Patent of the United States is—

1. In a cushioned automatic car coupling of the twin jaw type, the combination with the draw-head of a pivoted knuckle and draw-head lugs formed of two diameters, and provided with tapered bushings having hexagon-shaped outer ends and slotted inner ends adapted to receive and hold the end of coiled springs operating in connection with said bushing, and around the securing rivet, to cause the knuckle to rotate into an open position, substantially as and for the purpose set forth and described.

2. In an automatic car coupling of the cushioned and twin jaw type, the combination with the draw-head of a pivoted knuckle having its arm hollow, and its end rounded and adapted to the use of curved compound locks secured in a hood, having two departments located in the upper side of the draw-head, serving to retain said knuckle in a closed and locked position, substantially as set forth and described.

3. In an automatic car coupling of the twin jaw type, the combination with the draw-head, of a pivoted knuckle having internal springs connected with the pivot points, and a securing bolt, operating to automatically open said knuckle when released from a locked position, substantially as and for the purpose described.

4. In a car coupling of the twin jaw type, the combination with the draw-head of a pivoted knuckle, a swinging compound lock composed of one or more secondary locks, a rotating cam and rock pin, and an external bracket secured to said draw-head, substantially as and for the purpose set forth.

5. In a car coupling of the twin jaw type, the combination with the draw-head, of a pivoted knuckle and pivot bearings, and coiled springs arranged within said knuckle to cause the same to rotate into an open position by means of the tension given said springs by pressure of the pivot bearings, substantially as described and set forth.

6. In a car coupling of the twin jaw type, the combination with the draw-head, of a piv-

oted knuckle, a removable bracket, and the operating levers with a connecting bar and rock pins, substantially as and for the purpose set forth.

7. In a car coupling of the twin jaw type, the combination with the draw-head, of a pivoted knuckle, a hood with two departments reinforced with outer ribs and having pivoted within a main lock, in combination with one or more secondary locks operating independently of the main lock, substantially as and for the purpose specified.

8. In a car coupling of the twin jaw type, the combination with the draw-head, of a pivoted knuckle, a swinging compound lock, a rock pin and cam of the construction shown and the bracket mechanism secured to either side of the draw head for simultaneously releasing said locks to disconnect the couplers, substantially as and for the purpose set forth and described.

9. In a car coupling of the twin jaw type, the combination with the draw-head, of a pivoted knuckle, the automatic mouth block, having a trip dog and retaining latch for automatically coupling with the pin and link type of couplers, substantially as and for the purpose set forth.

10. In a car coupling of the twin jaw type, a removable mouth block provided with a trip dog and retaining latch, designed to protect the coupling jaws from damage, substantially as and for the purpose set forth and described.

11. In a car coupling a head constructed substantially as shown, with a hood of the kind described upon its top side, and an opening combined with the incline in its bottom side, and the transverse openings of the bar stem, for the use and reception of several constructions and changes of locks, substantially as and for the purpose specified.

12. In a car coupling of the twin jaw type, the combination with the draw-head, of a pivoted knuckle, a compound lock, a rock pin with an uncoupling cam having an inclined bearing face and nose of the form shown, and provided with a stoplug, substantially as and for the purpose set forth.

13. In a car coupling, the mouth block of oblong shape having a hole through its center, serving to couple with the link in the nose of the jaw, and to prevent the pin from bending, substantially as described and set forth.

14. In a car coupling of the twin jaw type, the combination with the draw bar stem, of a pivoted combined draw-bolt and pocket, a vertical and transverse key, and a clevis with pivot pin or bolt, substantially as and for the purpose set forth and described.

15. In a car coupling of the twin jaw type, the combination of the pivoted pocket plates, and the rear end plate to allow the coupler to move laterally without damage to the pocket or bar stem, substantially as and for the purpose set forth.

16. In a car coupling of the kind shown, a

knuckle made to conform to the contour here-
inbefore described with its front face slightly
concaved, its nose formed to the several ra-
diuses described and having its inner face
5 formed of reverse circles of unequal diame-
ters, the greater of which intersects a tangent,
a⁹⁹ thus forming a combined rotary tread face
jaw when coupled together, substantially as
and for the purpose set forth.

10 17. In a car coupling, the combination of the
guard arm provided with a socket and inner
projecting lip, a buffer secured therein and
provided with a stop shoulder to co-operate
with a corresponding guard arm stop, and a
15 cushion interposed between the buffer and
the bottom of the socket, as and for the pur-
pose set forth and described.

18. In a car coupling of the cushioned mas-
ter car builders' type, the combination of an
20 elliptic formed pocket, the extended sub
chambers, the elliptic formed cushion with an
air chamber provided by means of said cush-

ion and the wall of said pocket, substantially
as and for the purpose set forth and described.

19. A car coupling of the cushioned master 25
car builders' type having a pocket with ex-
tended end chambers for the reception of a
similar and elliptic formed cushion to receive
the impact of the incoming knuckle arm when
making connection with said couplings, or 30
when meeting with both knuckles closed, sub-
stantially as and for the purpose set forth.

20. A car coupling of the master car build-
ers' type having a pocket of the kind shown,
in combination with an elliptic formed cush- 35
ion, the abutment walls, and the incline ribs,
substantially as set forth and shown.

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

ALVIN W. VAN DORSTON.

Witnesses:

O. J. HART, Jr.,
B. A. ALLEN.