W. R. MATTHEWS.

DRAFT GEAR FOR RAILWAY CARS.

APPLICATION FILED AUG. 12, 1908.

950,489.

Patented Mar. 1, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

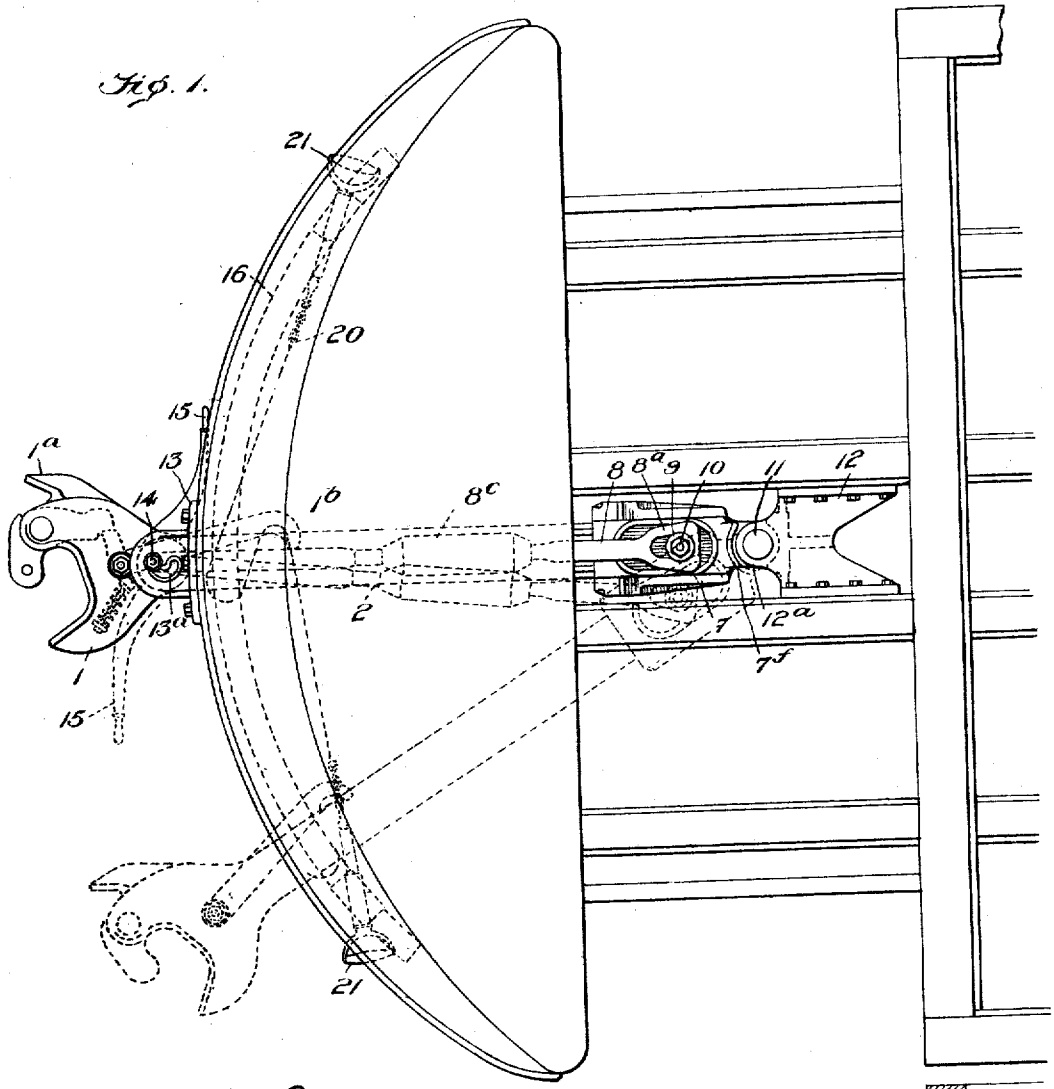
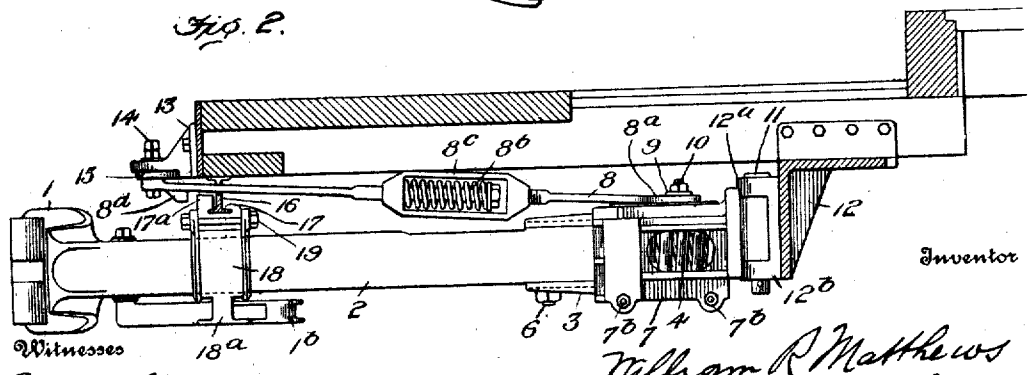


Fig. 2.



Witnesses

Edwin L. Bradford

L. P. Ritter

Inventor

William R. Matthews

By F. W. Ritter, Jr.

Attorney

W. R. MATTHEWS.

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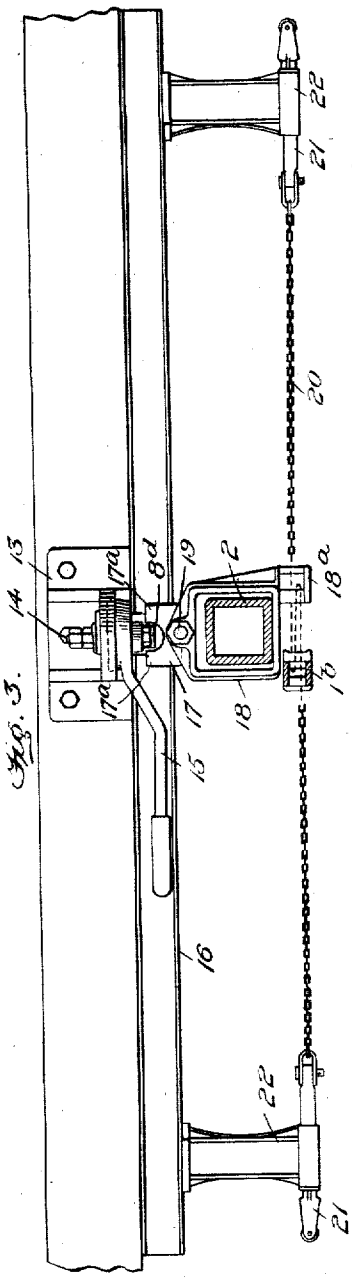

Fig. 5.

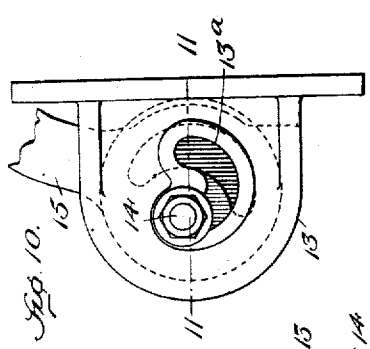

Fig. 10.

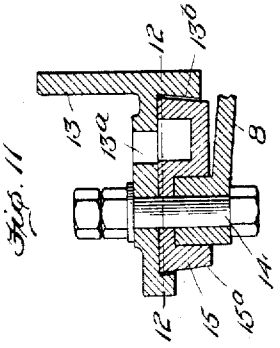

Fig. 11.

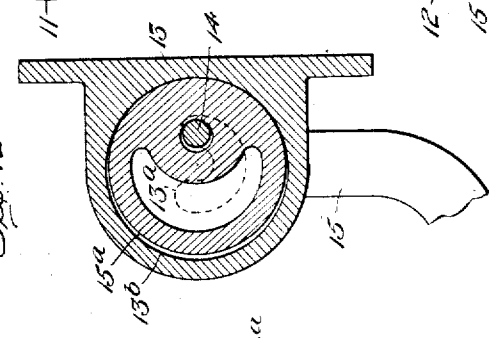

Fig. 12.

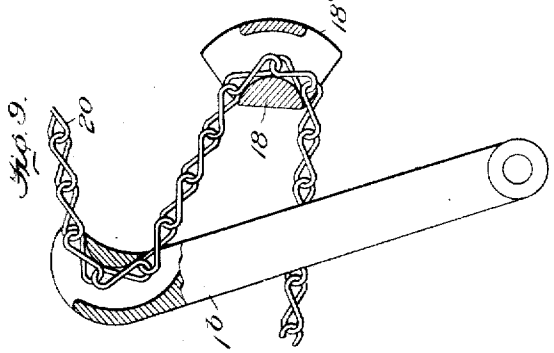

Fig. 9.

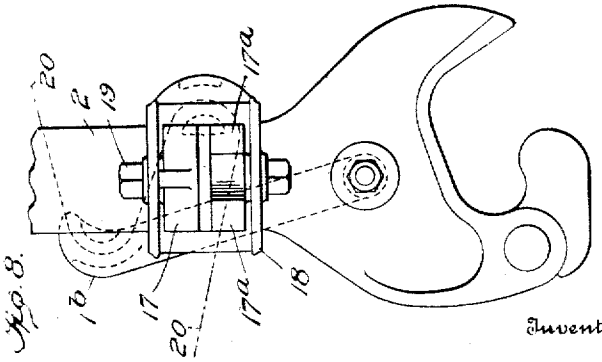

Fig. 8.

Witnesses

Edward L. Bradford

L. P. Ritter

Inventor

William R. Matthews

By F. P. Ritter Jr.

Attorney

W. R. MATTHEWS.

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3 SHEETS—SHEET 3.

Fig. 4.

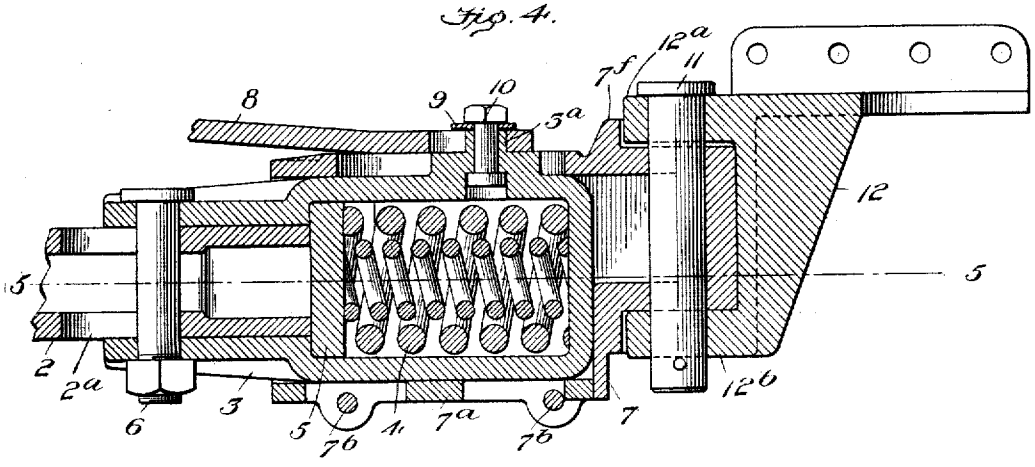


Fig. 5.

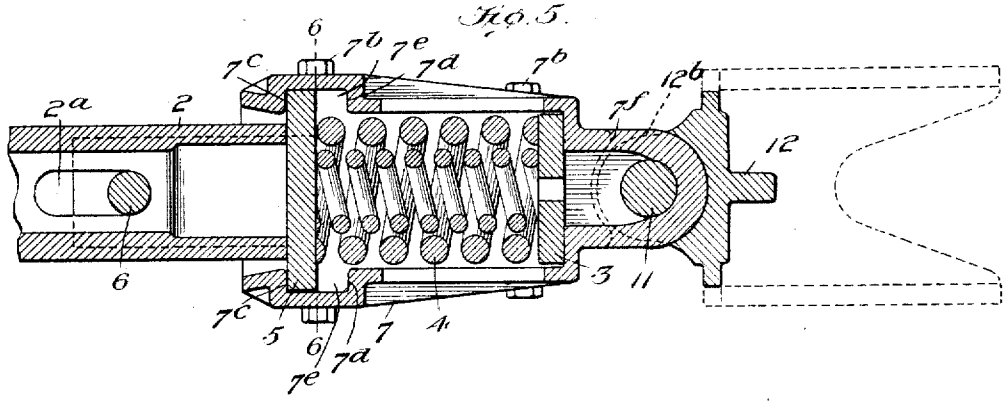


Fig. 6.

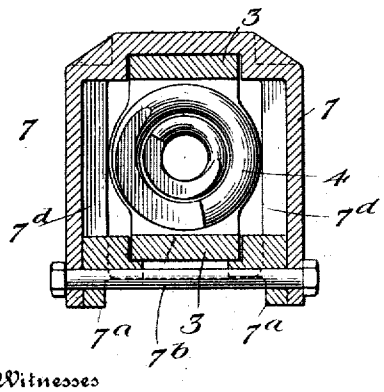
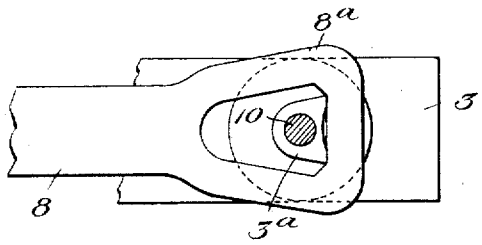


Fig. 7.



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Edwin L. Bradford

F. P. Ritter

Inventor

William R. Matthews

By F. N. Ritter, Jr.

Attorney

UNITED STATES PATENT OFFICE.

WILLIAM R. MATTHEWS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE McCONWAY & TORLEY COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DRAFT-GEAR FOR RAILWAY-CARS.

950,489. Specification of Letters Patent. Patented Mar. 1, 1910.

Application filed August 12, 1908. Serial No. 448,128.

To all whom it may concern:

Be it known that I, WILLIAM R. MATTHEWS, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Draft-Gear for Railway-Cars; 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 invention relates to the construction of draft gear for railway cars, and particularly to that class of draft gear in which the coupler is designed to have a lateral swinging movement in order that the attached car may pass around very sharp curves.

The principal objects of the invention are to furnish devices of this character which are simple in construction and efficiently operate to normally maintain the coupler in the longitudinal axis of the car, and to supply means whereby the coupler may be readily coupled and uncoupled when the cars are upon a curve. As these devices are of special utility on street and suburban railway cars, the invention has been illustrated in connection with the framing of such a car; but it is to be understood that the invention is equally applicable to any other type of car.

In the drawings chosen for the purpose of illustrating my invention, the scope whereof is pointed out in the claims, Figure 1 is a plan view of a draft gear embodying my invention, showing a portion of the framing of a car to which it is attached and illustrating in dotted lines the positions assumed by the parts when the car is passing around a curve and the position of the centering bar adjusting lever when the coupler is locked in a centralized position; Fig. 2 is a side elevation of the draft gear illustrated in Fig. 1, the parts being shown in the positions they occupy when the coupler is in its normal or central position; Fig. 3 is an end view of the devices shown in Fig. 1, the parts being in a central position and the coupler head being omitted; Fig. 4 is a detail vertical central section of those parts of the draft gear which are adjacent to its point of pivotal connection with the car; Fig. 5 is a detail horizontal section taken in the plane of the line 5—5, Fig. 4; Fig. 6 is a detail vertical section taken in the plane of the line 6—6, Fig. 5; Fig. 7 is a detail view showing in plan the connection between the yoke or spring pocket and the coupler centering member; Fig. 8 is a detail plan view showing the coupler and its unlocking mechanism; Fig. 9 is a detail view, partly in plan and partly in horizontal section, further illustrating the unlocking devices shown in Fig. 8; Fig. 10 is a detail plan view of the devices for adjusting the centering bar, the parts being in the positions they normally occupy, and a portion of the handle of the adjusting lever being broken away; Fig. 11 is a vertical central section taken in the plane of the line 11—11, Fig. 10; and Fig. 12 is a horizontal section taken in the plane of the line 12—12, Fig. 11, the adjusting lever being shown in the position it occupies when the coupler is locked in a centralized position.

Like symbols refer to like parts wherever they occur.

I will now proceed to describe my invention more fully so that others skilled in the art to which it appertains may apply the same.

The coupler, which is pivotally connected to the body of the car in a yielding manner by means hereinafter described, is provided with a head 1 and stem 2 which, as shown, are preferably formed as an integral casting. Any form of coupler head desired may be employed, but it is preferred to use a coupler head of the vertical plane type having an auxiliary guard-arm, such as 1^a, formed upon or attached to the knuckle side of said head 1. This auxiliary guard-arm 1^a, as shown in dotted lines in Fig. 1, engages the guard-arm of the mating coupler when the cars are passing around a curve and thus, notwithstanding the couplers may be greatly worn from service, prevents the possibility of the cars pulling apart without an opening movement of one of the knuckles.

Attached to the rear end of the coupler stem 2 in such manner as to permit a longitudinal movement relative thereto is a yoke or spring-pocket 3 which passes around the draft spring 4 and the follower 5. One end of the said draft spring bears upon the rear end of the yoke, and the other end is seated

upon the follower. As shown, the coupler stem 2 and yoke 3 may be conveniently connected by a bolt 6 which passes through closely fitting openings in the said yoke and through a vertical slot 2^a formed in said stem. The slot 2^a in the coupler stem is sufficiently long to permit the draft spring 4 to be fully compressed when the coupler moves rearwardly in buffing, as will hereinafter appear.

The yoke or spring pocket 3 is preferably formed as an integral steel casing. It is adapted to reciprocate within the draft member 7 by which it is housed, said draft member 7 having an elongated opening in the top through which projects the lug or stud 3^a that is fastened upon the upper face of the yoke 3 for the purpose of forming a means of attachment for the centering bar 8. The lug or stud 3^a is formed with a flat transversely extending rear face (see Fig. 7) which engages a correspondingly extending flat face formed in the eye or loop 8^a with which the rear end of the centering bar 8 is provided, such a construction being preferred because it is especially efficient in accurately maintaining the coupler in a central position.

In order to prevent the centering bar 8 from becoming disassociated from the spring-pocket 3, it is preferred to connect these parts by a washer or plate 9 and a bolt 10, the washer bearing upon the upper face of the eye 8^a of the member 8 and the bolt, which holds it in place, passing through an aperture in the connecting stud 3^a formed on the yoke 3.

As heretofore explained, the yoke 3, draft spring 4 and follower 5 are housed within a draft member 7 in such manner that the said yoke may slide therein. This draft member 7 is preferably formed with an open forward end to permit the rear end of the coupler stem 2 and the forward end of the yoke 3 to play therethrough, and with a detachable bottom 7^a which permits the introduction of the yoke, draft spring and follower when the draft gear is being assembled. Bolts such as 7^b, which pass through perforated lugs or ears formed on the main portion of the member 7 and on the detachable bottom plate 7^a, may be conveniently employed for attaching the said bottom to the upper portion of the draft member.

The interior of the draft member 7 is provided at its forward end with vertically extending grooves for the reception of the follower 5. The front walls, 7^c, of these vertically extending grooves form stops or abutments for limiting the forward movement of the follower 5, while the rear walls, 7^d, thereof form stops for similarly limiting the rearward movement of said follower. The follower confining grooves are closed at the bottom by means of lugs 7^e formed upon the detachable bottom plate 7^a. As will be readily understood, the distance between the follower stops 7^c and 7^d controls the amount the draft spring 4 can be compressed when the coupler moves rearwardly in buffing. In the application of my invention to suburban street railway cars, the full compressive resistance of the draft spring in buffing is not necessary and hence in the particular construction illustrated in the drawings the follower stops 7^d are arranged to arrest the rearward movement of the follower 5 before the full capacity of the spring 4 is exhausted.

The rear end of the draft member 7 is provided with an exhaustion 7^f which is perforated for the reception of the pivot bolt 11 by which the parts heretofore described are connected to the pivot member 12 that is bolted or otherwise rigidly secured to the framing of the car. The pivot receiving portion 7^f of the draft member 7 is interposed between and restrained from vertical movement by the pivot lugs 12^a and 12^b of the pivot member 12, the rear end face of said extension 7^f being cylindrical in form and engaging the correspondingly curved face of the pivot casting 12 between the pivot lugs 12^a and 12^b thereof.

In order that a coupling may be readily made when the car is upon a curve, the centering bar 8 is preferably formed of two parts which are connected through the medium of spring 8^b. The forward end of the rear section of the member 8 is provided with an attached follower member 8^c which is open upon the sides to permit the introduction of the centering bar spring, the forward end of said follower member 8^c being perforated to permit the rear end of the forward section of the centering bar 8 to pass therethrough and slide therein. The centering bar spring 8^b is threaded upon the forward section of the centering bar and is maintained thereon by means of a nut, as shown. The spring 8^b is normally compressed, by means of the adjusting lever 15 as will hereinafter more fully appear, a sufficient amount to center the coupler. When the full capacity of the spring is required for this purpose the centering bar 8 will operate as a practically inextensible member when performing its functions in centralizing the coupler. When it is desired to make a coupling while the car is upon a curve, the adjusting lever 15 is moved toward the position shown in dotted lines in Fig. 1, thus permitting a sufficient rearward movement of the pivot bolt 14 and the attached forward section of the centering bar 8 to allow the expansion of the spring 8^b, as will presently appear. When the spring 8^b is thus expanded the centering bar is capable of extension so that it may readily accommodate itself to any of the various laterally

displaced positions which it may be necessary for the coupler to assume when making a coupling upon a curve.

The forward end of the centering bar 8 is pivotally attached to the car so that it may swing laterally as the car passes around a curve, and the arrangement is such that the normal pressure of the centering bar spring 8^b upon the separate sections of the centering bar 8 may be released to permit the coupler to be swung manually to any desired position and to remain in such position while a coupling is being made. For this purpose the centering-bar pivot member 13, which is secured to the car framing in the longitudinal axis thereof, is provided with an arc shaped slot 13^a which receives the pivot bolt 14 by which the centering-bar 8 and adjusting lever 15 are connected to said member 13. As shown more particularly in Fig. 10, the center of the outer end of the curved slot 13^a is located on the opposite side of the longitudinal axis of the car (represented by the line 11—11) from that occupied by the main portion of said slot. By this means the pivot bolt 14, when once brought to the forward position, is retained in such position by the spring pressure exerted upon the centering-bar 8, and the slight displacement of the pivot bolt 14 from the longitudinal center of the car has no appreciable effect upon the operation of said centering-bar in maintaining the coupler in a centralized position.

The adjusting lever 15 is preferably provided with a conical or tapering portion 15^a which fits into and turns within a corresponding tapered or conical socket 13^b formed in the underside of the centering-bar pivot member 13. The axis of the conical socket 13^b passes through the centering-bar pivot member 13 a slight distance in advance of the center of curvature about which the circular slot 13^a is described. By forming the slot 13^a and socket 13^b eccentric with respect to each other, the conical head 15^a of the adjusting lever, which is somewhat smaller than its said socket 13^b, is jammed against the rear conical face of the said socket (see Fig. 12) when the adjusting lever 15 is turned for the purpose of forcing the forward section of the centering-bar 8 rearwardly a distance sufficient to cause the coupler to be locked in the center line of the car, as will hereinafter appear. By this means the adjusting lever 15 may be frictionally locked in position.

For supporting the coupler at its forward end so that it may swing freely from side to side and also be capable of longitudinal movement, the following construction is preferred. A curved supporting carrier-rail 16 of flanged form is attached to the under side of the framing near the end of the car. As shown in Figs. 2 and 3, this carrier-rail is slotted at the center to permit pivotal movement of the centering-bar 8. Slidingly mounted upon the lower flanges of said rail 16 is a carrier-slide 17 from which the carrier 18 is pivotally suspended by means of a bolt 19. The carrier 18 is provided with a rectangular opening in which the coupler stem 2 is supported so that it may not only reciprocate longitudinally but may also have slight vertical and lateral movements with respect to said carrier. By pivotally connecting the carrier 18 to the carrier-slide 17 the flat bearing faces of the latter are effectually prevented from gripping the carrier-rail 16 upon lateral movement of the coupler.

As the couplers used upon street or suburban cars are generally formed with long stems or shanks, it is very desirable to have some means for maintaining the coupler in the center line of the car when one car is pushing another. For this purpose the forward section of the centering bar 8 is preferably formed near its outer end with a depending locking lug 8^d which is adapted to slide between and engage two upwardly extending locking lugs 17^a which are formed upon the carrier-slide 17. The distance which the lug 18^d may move rearwardly before engaging the lugs 17^a is sufficient to relieve the compression on the centering-bar spring 8^b and also to permit the coupler to be swung laterally in either direction from the longitudinal axis of the car; but upon a farther rearward movement of the centering-bar 8 the said lugs 8^d and 17^a engage and the coupler is effectually locked in the center line of the car, as will be readily understood, the eye or loop 8^a formed on the rear end of said centering bar 8 permitting the additional rearward movement of said bar.

When a coupler release rigging such as that shown in the drawings is employed, the movable carrier 18 is provided with a slotted extension or bracket 18^a through which the uncoupling chain is adapted to freely slide as the coupler moves laterally when locked, and by the coöperation of which with other parts, as will hereinafter appear, the coupler lock is actuated to release the knuckle.

The coupler release rigging preferably employed for unlocking the coupler in any of the positions it may occupy consists of a flexible member, such as the chain 20, which passes through the slotted guide bracket 18^a of the carrier 18 and through a slot formed in the end of the lever of the coupler lock 1^b, the ends of the chain being attached to pull handles 21 that are slidably mounted in brackets 22 which are secured to and extend downwardly from the car framing at points adjacent to the corners of the car. When the handles 21 are in their normal

positions (Fig. 3), the chain 20 slides freely through the slot in the guide bracket 18^a and through the slot in the lock lever 1^b as the coupler swings laterally, the coupler thus remaining locked. But if in any position which the coupler may occupy one or both of the handles 21 should be pulled outwardly it will be perceived that the reverse curve in the chain, formed by the passage thereof through the guide bracket 18^a and lock lever 1^b, will be somewhat straightened, with the result that the lock lever 1^b is moved toward the said guide bracket on the carrier 18 and the coupler is unlocked. The coupler lock, as illustrated in Fig. 1, is preferably of the spring-actuated type commonly employed in passenger car couplers, so that when the pull upon the handle 21 is released the coupler lock again assumes a locked position and the several devices constituting the coupler release rigging are returned to their normal positions.

The construction being substantially such as hereinbefore pointed out, the operation of the draft rigging devices will be as follows. Assuming the parts to be in the position they normally occupy, as shown in full lines in Fig. 1, a draft strain exerted upon the coupler will cause the yoke or spring-pocket 3, which is connected to the coupler stem 2 by means of the bolt 6, to execute a coextensive forward movement, thus compressing the draft spring 4 between the rear end of said yoke and the follower 5. During the forward movement of the yoke the follower 5 is supported against forward movement by the follower stops or abutments 7^c formed upon the interior of the pivoted draft member or housing 7, so that the draft strains are ultimately transmitted to the car framing through said pivoted draft member, the pivot pin 11 and the pivot casting 12. During the forward movement of the yoke 3 under the influence of draft forces, the rear section of the centering bar 8 is also moved coextensively forward in contact therewith by the centering bar spring 8^b; but when said spring has fully expanded, the elongated loop or eye 8^a formed on the centering bar 8 permits the connecting stud 3^a of the yoke to move forward with respect to said member 8, thus enabling the draft spring 4 to be fully compressed without transmitting any of said draft forces to the centering-bar.

In buffing the yoke 3 is supported against rearward movement by the pivoted draft member 7, as more particularly illustrated in Figs. 4 and 5. As the coupler moves rearwardly with relation to the yoke 3, which it is permitted to do by reason of the pin and slot connection between the coupler stem and yoke, the coupler stem 2 forces the follower 5 toward the rear end of the yoke, thus compressing the draft spring 4. The follower stops or abutments 7^d upon the draft member 7 may be located at such a distance from the forward follower abutments 7^c as to permit the utilization of the desired spring resistance in buffing. In the drawings the stops 7^d are so positioned that the follower 5 is arrested before the full spring resistance of the draft spring 4 has been exhausted, leaving in the draft spring sufficient free movement to accommodate the lateral displacement of the coupler. As the initial compression of the centering bar spring 8^b acts upon the yoke 3 and tends to pull it forward slightly against the pressure of the draft spring 4, the latter is given sufficient initial compression to keep the rear end of said yoke 3 normally in contact with the rear inner face of the pivoted draft member 7, there being thus no rearward movement of the yoke 3 under the influence of a buffing shock. When the coupler is displaced laterally from its normal position in the longitudinal axis of the car, the centering-bar 8 turns upon the pivot bolt 14, which then occupies its forward position. As the centering-bar 8 is in engagement with the connecting stud 3^a on the yoke 3, the turning movement executed by said bar causes the attached yoke or spring pocket 3 to slide forward in the pivoted draft member 7, thus compressing the draft spring 4 between the rear end of said yoke and the follower 5. If the centering bar spring 8^b has been given an initial compression equal to its full capacity, thus making the centering-bar 8 substantially inextensible during its operation of centering the coupler, the connecting stud 3^a on the yoke 3 will move upon the arc of a circle of which the pivot bolt 14 in its forward position is the center, thus causing a considerable compression of the draft spring 4. If, however, as is preferred, the initial compression of the spring 8^b is less than its full capacity, the connecting stud 3^a will traverse a path that is intermediate of the two circular arcs which pass through the normal position of the said stud 3^a and which are described about the pivot bolts 11 and 14, respectively, as centers. In the latter case both the draft spring 4 and centering-bar spring 8^b will be compressed when the coupler is displaced laterally, the amount which each spring is compressed being dependent upon the relative strength of the two springs. When the force causing the lateral displacement of the coupler is withdrawn, the expansion of the centering bar spring 8^b and the draft spring 4, or of the latter spring only, as the case may be, causes the coupler to be returned to its normal or centralized position.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a draft gear, the combination with a

coupler, of means whereby said coupler may be pivotally connected to a car, a pivoted centering bar which acts upon and is movable laterally with said coupler, and means whereby the length of said centering bar may be varied, said means including a spring.

2. In a draft gear, the combination with a coupler, of means whereby said coupler may be pivotally connected to a car, a centering bar which acts upon and is movable laterally with said coupler, and means whereby the said centering bar may be caused to normally turn about one pivotal center and to turn about a different pivotal center when a coupling is to be made upon a curve.

3. In a draft gear, the combination with a coupler and means whereby it may be pivotally connected to a car, of a pivoted centering bar, and means connecting said centering bar with said coupler, said centering bar and said connecting means having flat engaging faces.

4. In a draft gear, the combination with a coupler, of a yoke movably connected thereto, a draft spring carried by said yoke, and a centering bar which is pivotally attached to said yoke and which is provided with means whereby it may be pivotally connected to the car.

5. In a draft gear, the combination with a coupler, of a draft member provided with means whereby it may be pivotally connected to a car, a yoke slidably mounted in said draft member and movably connected to said coupler, a spring carried by said yoke, and a laterally movable centering bar which is pivotally attached to said yoke.

6. In a draft gear, the combination with a coupler, of a draft member provided with means whereby it may be pivotally connected to a car, said draft member having an opening in the top thereof, a yoke slidably mounted in said draft member, a spring carried by said yoke, a centering bar, and means passing through said opening in the draft member for pivotally connecting said centering bar and yoke.

7. In a draft gear, the combination with a coupler, of a yoke connected thereto, a spring carried by said yoke, a follower bearing upon said spring, and a draft member in which said yoke is slidably mounted, said draft member having follower grooves which receive said follower and limit the forward and rearward movements thereof.

8. In a draft gear, the combination with a coupler, of means whereby said coupler may be pivotally connected to a car, a centering bar connected to said coupler, and pin and slot devices for pivotally connecting said centering bar to the car.

9. In a draft gear, the combination with a coupler, of means whereby said coupler may be pivotally connected to a car, a centering bar connected to said coupler, a centering bar pivot member having a curved slot therein, a pivot bolt passing through said curved slot and connected to said centering bar, and means whereby the position of the pivot bolt in said slot may be changed.

10. In a draft gear, the combination with a coupler, of means whereby said coupler may be pivotally connected to a car, a centering bar connected to said coupler, a centering bar pivot member provided with a curved slot and with a socket, a pivot bolt passing through said curved slot and connected to said centering bar, and an adjusting lever whereby the position of the pivot bolt in said slot may be changed, said adjusting lever having a head fitting into the socket in said centering bar pivot member.

11. In a draft gear, the combination with a coupler, of means whereby said coupler may be pivotally connected to a car, a centering bar connected to said coupler, a centering bar pivot member provided with a circular slot and with a conical socket, the center of curvature of the circular slot lying outside the axis of the conical socket, a pivot bolt passing through said circular slot and connected to said centering bar, and an adjusting lever whereby the position of the pivot bolt in said slot may be changed, said adjusting lever having a tapering head fitting into said conical socket.

12. In a draft gear, the combination with a coupler, of means whereby it may be pivotally connected to a car, and means for supporting said coupler so that it may swing laterally and also be movable longitudinally, said last named means comprising a curved carrier rail, a carrier slide slidably mounted upon said rail, and a carrier member which is pivotally connected to said carrier slide and is provided with an opening permitting the said coupler to slide longitudinally therethrough.

13. In a draft gear, the combination with a coupler, of means whereby it may be pivotally connected to a car, a guide bracket movable with said coupler, and a flexible member which extends across the end of the car and passes through said guide bracket and through a portion of the coupler lock.

14. In a draft gear, the combination with a coupler, of means whereby it may be pivotally connected to a car, a guide bracket movable with said coupler, and a flexible member which passes through and forms a reverse curve between said guide bracket and a portion of the coupler lock.

15. In a draft gear, the combination with a coupler of means whereby it may be pivotally connected to a car, a draft spring, a pivoted centering bar connected to said coupler, and locking devices whereby said coupler when in its central position may be locked against lateral displacement, said

locking devices being brought into locking engagement by a longitudinal movement of the centering bar.

16. In a draft gear, the combination with a coupler, of means whereby it may be pivotally connected to a car, a centering bar connected to said coupler, and interlocking devices connected to said coupler and said centering-bar whereby said coupler may be locked against lateral displacement.

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

WILLIAM R. MATTHEWS.

Witnesses:

J. W. HARTLEY,

F. D. ECKER.