

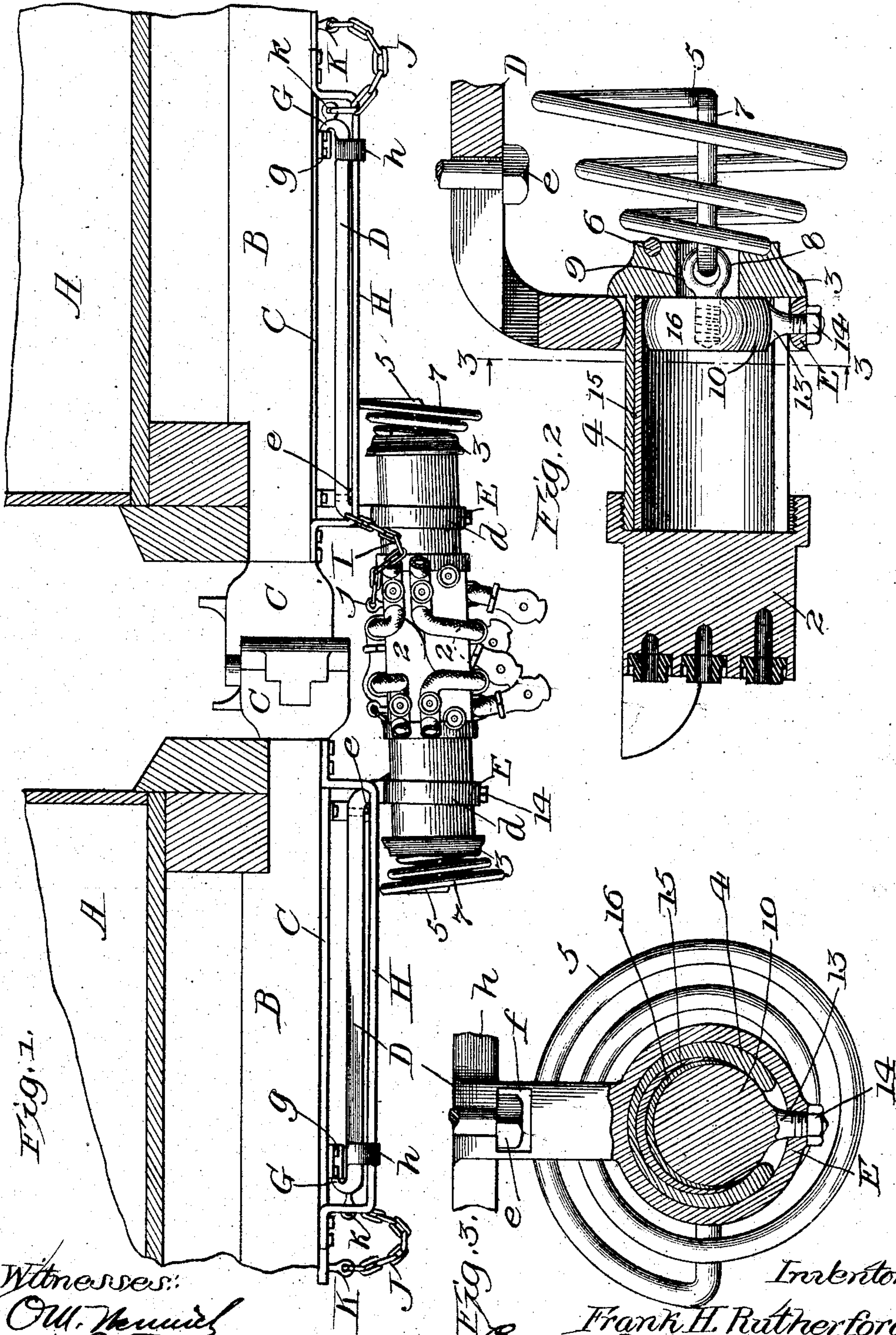
No. 843,911.

PATENTED FEB. 12, 1907.

F. H. RUTHERFORD.
AUTOMATIC TRAIN PIPE COUPLING.

APPLICATION FILED AUG. 4, 1906.

2 SHEETS—SHEET 1.



Witnesses:
O. W. Merrill
H. C. Lawson

Inventor
Frank H. Rutherford
By *Charles H. Thomas, Atty.*

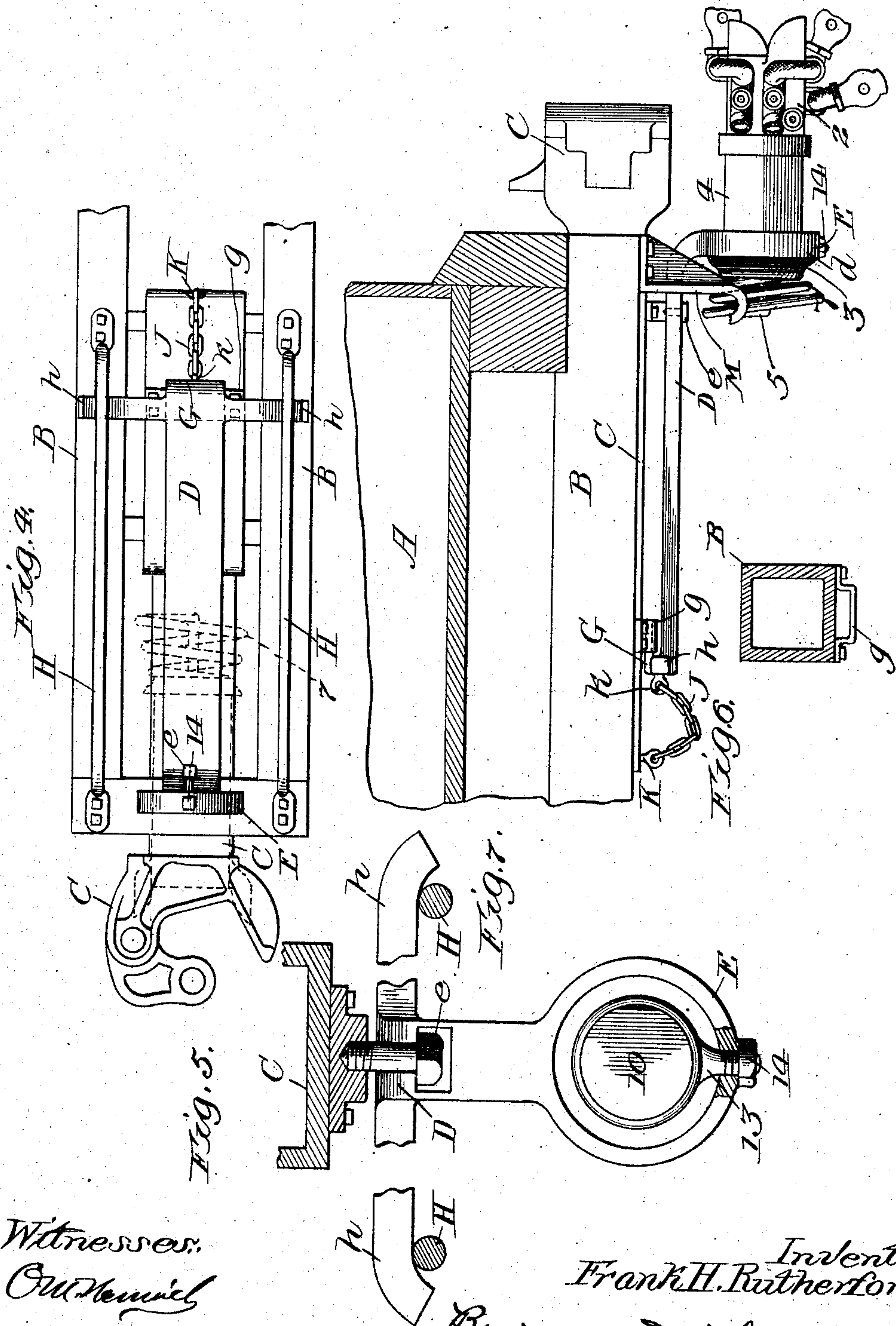
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Inventor
Frank H. Rutherford
By Frank D. Hanson
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UNITED STATES PATENT OFFICE.

FRANK H. RUTHERFORD, OF CHICAGO, ILLINOIS.

AUTOMATIC TRAIN-PIPE COUPLING.

No. 843,911.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed August 4, 1906. Serial No. 329,266.

To all whom it may concern:

Be it known that I, FRANK H. RUTHERFORD, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Train-Pipe Couplers, of which the following is a clear, full, and exact description.

My invention relates to automatic train-pipe couplers; and its object, in addition to automatically engaging the coupler and establishing a perfect communication with the pipe system of the other cars of the trains connected therewith and adapt itself to any angle required by the exigencies of the train and cars thereof, is to enable it to move with the car-coupler and its draw-bar, and thereby avoid the necessity of providing automatic adjustment for it in order to accommodate itself to the movements of said car-coupler; and its object is also to greatly reduce the length of the automatic coupler and to reduce to a minimum the wear of the coupler and its support.

In the drawings, Figure 1 is a side elevation of the ends of two connected cars having my improved automatic couplers applied thereto. Fig. 2 is a longitudinal central section through one of said couplers detached from the car. Fig. 3 is a section of the body of the coupler, taken on dotted line 3 3, Fig. 2, and drawn to a larger scale. Fig. 4 is a plan view of the under side of the end of the carrier of a car having my improvements applied thereto, with the automatic coupler shown in dotted lines. Figs. 5 and 6 are views of details of my invention. Fig. 7 is a side elevation of a modified form of my improvement.

Referring to the drawings, A represents the end of the car to which my improvements are applied. B represents the center sills thereof, and C the car-coupler and its draw-bar.

The car-coupler may be of any desired design, and the rigging for securing the draw-bar of said coupler to the car may be constructed in any suitable manner, so long as it yields to and modifies the sudden strains and concussions to which the car-coupler is subject.

My improvements comprise an automatic train-pipe coupler, a carrier therefor, and means for detachably connecting said carrier to the draw-bar in such manner that the said carrier will move bodily with the draw-bar under normal conditions, but will bodily

wrench loose therefrom without injury to itself or the train-pipe coupler carried thereby should the car-coupler and its draw-bar be torn from the car.

The carrier D of my invention consists of a longitudinally-disposed bar which is preferably less in length but about the same width as and is placed parallel with and under the draw-bar. Its forward end is bent downward to form a hanger *d*, the lower end of which is formed into a ring or annulus E, through the opening in which the train-pipe coupler extends, as will hereinafter be more fully explained. The carrier is secured to the coupler by means of a bolt depending down from the bottom of the draw-bar near its head, which bolt *e* extends into a slot *f*, made longitudinally in the bend of the carrier. The portion of the slot in the bend of the hanger has its lower part made wider, so that when assembling the equipment the head of the bolt may be passed therethrough and its shoulders catch under and support the forward end of the carrier. The rear end of the carrier is preferably made narrower and bent upward and then forward to form a hook G, the upper horizontal portion of the bend of which is adapted to enter the eye of a suitable staple *g*, secured to and depending from the under side of the draw-bar near its lower end.

At about the bend of the hook G carrier D is provided with transversely-projecting arms *h h*, which extend past and, if desired, may ride upon the longitudinally-disposed horizontal guide-rails H H, which are parallel to each other and have their upturned extremities secured to the under side of the center sills of the car. Should the coupler be torn from its moorings, the carrier D would move with the draw-bar until the bolt *e* pulls out of slot *f* and the staple *g* would move away from hook G. When this happens, the forward end of the carrier and the automatic coupler F would fall; but I limit the extent of this fall by means of a chain I, one end of which is secured to the forward end of guide-rails H and the other end to a suitable eye *j*, secured to and projecting up from the forward end of said coupler F, as shown. I also relieve the strain on this chain, when the draw-bar is torn from its moorings, by a chain J, that limits the forward movement of said coupler. One end of this chain J is secured to an eye K, secured to the bottom of the car a suitable distance to the rear of the draw-bar, and the

other end of which is secured to an eye *k*, projecting rearwardly from the bend of the hook *G* of said carrier.

The automatic coupler *F* is constructed substantially the same as that illustrated and described in the application for Letters Patent of the United States filed by me June 13, 1906, Serial No. 321,547, except that the rear end of the cylindrical extension 4 of the body extends back of the annulus and provided with a partly-closed end 2 and is provided with a circumferential flange 3, which is adapted to bear against the rear surface of the annulus *E*. The horizontal position of the coupler is maintained by means of a comparatively heavy helical spring 5, the smallest spiral of which is seated in a circular groove 6 in the rear of end 2 and the largest spiral of which has its end 7 extended to the center thereof and then extended axially to and through an opening 8 in the center of head 2, where its extremity is formed into an eye and linked or articulated with an eye 9, extending through opening 8 from the center of a pivotal head 10. Head 10 consists of a circular plate which is passed up through a longitudinal slot in the bottom of the cylindrical extension 4 of the coupler and fits within and is adapted to have edgewise contact with the inner circumference of said cylindrical extension. This head is provided with a screw-threaded shank 13, that passes through a suitable tapped opening in the lowermost segment of annulus *E* and has a nut 14 on its lower extended end, by tightening which said head can be readily secured in position in the same transverse plane as the annulus and at right angles to the axis of the coupler when the latter is in its normal position.

The helical spring 5 is an expansion-spring, and the pressure which its smallest spiral exerts against the head 2 normally keeps said head bearing against the annulus *E* sufficient to keep the coupler in a horizontal position, substantially as shown in Fig. 2 of the drawings. In order to prevent the wearing away of the contacting surfaces of the pivotal head 10 and the cylindrical extension 4 of the coupler, I face the inner circumference of said extension with steel 15, and I provide a steel rim 16 for the circumferential edge of the head 10. The edges of said pivotal head are rounded, and the inner circumference of the annulus is likewise rounded, so as not to interfere with the movement of the coupler to any angle which its engagement with other train-pipe couplers may require.

In Fig. 9 I show a modified form of my invention, in which the principal difference is in the omission of guide-rails *H* and the substitution therefor of hooks *M*. The latter are secured to and depend down from the center sills near the end of the car on each side of the car-coupler and in such position that when

the automatic couplers have been carried by the draw-bar of the coupler sufficiently forward toward the adjacent end of the car to a point beyond which it would be dangerous for them to go arms *h h* will catch against said hooks and when the automatic coupler is freed from the car-coupler will fall into and catch in said hooks.

What I claim as new is—

1. The combination with a car and a car-coupler, of an automatic train-pipe coupler, a carrier therefor non-shearably secured to said car-coupler, and means independent of said car-coupler for preventing the simultaneous accidental withdrawal of said carrier with said car-coupler from said car.

2. The combination with a car and a car-coupler, of an automatic train-pipe coupler, a carrier therefor non-shearably secured to and longitudinally removable from said car-coupler, and means independent of said car-coupler for preventing the simultaneous accidental withdrawal of said carrier with said car-coupler from said car.

3. The combination with a car and a car-coupler, of an automatic train-pipe coupler, a carrier therefor detachably secured to said car-coupler, and means independent of said car-coupler that guide said carrier in a longitudinal direction only and prevent the simultaneous accidental withdrawal of said carrier with said car-coupler from said car.

4. The combination with a car and a car-coupler, of an automatic train-pipe coupler, a carrier therefor non-shearably secured to and longitudinally removable from said car-coupler, and means independent of said car-coupler that guide said carrier in a longitudinal direction only and prevent the simultaneous accidental withdrawal of said carrier with said car-coupler from said car.

5. The combination with a car, and a car-coupler, of an automatic train-pipe coupler, a carrier therefor detachably secured to and movable with said car-coupler, and supplemental means secured to the car-body parallel to and at each side of said car-coupler for supporting said carrier independently of said car-coupler.

6. The combination with a car, and a car-coupler having a staple depending from its rear end, of an automatic train-pipe coupler, a carrier therefor having a hook adapted to engage the eye of said staple, and supplemental means connected to the car-body for supporting said carrier independently of said car-coupler.

7. The combination with a car, a car-coupler, and a bolt depending from said car-coupler, of an automatic train-pipe coupler, a carrier having its forward end turned downward and adapted to support said automatic coupler, and provided with a longitudinal slot intersecting said bend and engaged by said bolt.

8. The combination with a car, a car-coupler having a staple depending from its rear end, and a bolt depending from said car-coupler, of an automatic train-pipe coupler, a carrier having a hook adapted to engage the eye of said staple and having its forward end turned downward and adapted to support said automatic coupler, and provided with a longitudinal slot intersecting said bend and engaged by said bolt.

9. The combination with a car, a car-coupler, and a bolt tapped into and depending down from said car-coupler of an automatic train-pipe coupler, a carrier having a downturned forward end in which said automatic coupler is supported and having a slot in its forward bend engaged by said bolt, arms projecting laterally from said carrier, and means on each side of said car-coupler adapted to be engaged by said arms.

10. The combination with a car, a car-coupler, and a bolt tapped into and depending down from said car-coupler, of an automatic train-pipe coupler, a carrier having a downturned forward end in which said automatic coupler is supported and having a slot in its forward bend engaged by said bolt, arms projecting laterally from said carrier, and horizontal rails secured to the car-body on each side of said car-coupler adapted to be engaged by said arms.

11. The combination with a car, and a car-coupler, of an automatic train-pipe coupler, a carrier therefor detachably secured to and movable with said car-coupler, and having transverse arms projecting therefrom, and means on each side of said car-coupler adapted to be engaged by said arms.

12. The combination with a car and a car-coupler, of an automatic train-pipe coupler, a carrier therefor detachably secured to and movable with said car-coupler, and having transverse arms projecting therefrom, and horizontal rails secured to the car-body on each side of said car-coupler adapted to be engaged by said arms.

13. The combination with a car, a car-coupler having a staple depending from its rear end, and a bolt depending therefrom nearer its front end, of an automatic train-pipe coupler, a carrier having a hook adapted to engage the eye of the staple, having its forward end downturned and at its bend having a longitudinal slot therein into which said bolt enters and having transverse arms projecting therefrom, and horizontal rails secured to the car-body at each side of said car-coupler and adapted to be engaged by said arms.

14. The combination with a carrier having a downturned forward end and a suitable opening therein, and a pivot-head projecting from the edge of said opening into the same, of a train-pipe coupler having a suitable extension passing through said opening, into

the bore of which said pivot-head extends, and having its rear end flanged outward, and a helical spring one end of which bears against the rear end of said extension and the other end of which is returned through the coils of the spring and is connected to the pivotal head.

15. The combination with a carrier having a downturned forward end having a suitable opening therein and a removable pivot-head projecting from the edge of said opening into the same, of a train-pipe coupler having a suitable extension passing through said opening into the bore of which said pivot-head extends, and means for maintaining said coupler normally in a horizontal position.

16. The combination with a carrier having a downturned forward end having a suitable opening therein and a pivot-head projecting from the edge of said opening into the same and its engaging edge protected with a metallic facing, of a train-pipe coupler having a suitable extension passing through said opening, into the bore of which through a longitudinal slot said pivot-head projects, a metallic lining for the bore of said extension, and means for maintaining said coupler normally in a horizontal position.

17. The combination with a carrier having a downturned forward end having a suitable opening therein, and a removable pivot-head projecting from the edge of said opening into the same and its engaging edge protected with a metallic facing, of a train-pipe coupler having a suitable extension passing through said opening, into the bore of which through a longitudinal slot said pivot-head projects, a metallic lining for the bore of said extension, and means for maintaining said coupler normally in a horizontal position.

18. The combination with a train-pipe coupler having a rearward extension having a longitudinal slot therein, of a suitable support for said coupler, pivot-head having a screw-threaded shank removably secured in said support, and means for maintaining said coupler normally in a horizontal position.

19. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and an automatic train-pipe coupler supported thereby, of a chain connecting said carrier to the body of the car.

20. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and an automatic train-pipe coupler supported thereby, of a chain connecting said train-pipe coupler to the body of the car.

21. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and an automatic train-pipe coupler supported thereby, of a chain connecting said carrier, and an independent chain connecting said train-pipe coupler to the body of the car.

22. The combination with a car, and a car-coupler, of an automatic train-pipe coupler, a carrier therefor detachably secured to and movable with said car-coupler, supplemental means connected to the car-body for supporting said carrier independently of said car-coupler and a chain connecting said carrier to the car-body.

23. The combination with a car, and a car-coupler, of an automatic train-pipe coupler, a carrier therefor detachably secured to and movable with said car-coupler, supplemental means connected to the car-body for supporting said carrier independently of said car-coupler and a chain connecting said train-pipe coupler to the car-body.

24. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and an automatic train-pipe coupler supported thereby, supplemental means connected to the car-body for supporting said carrier independently of said car-coupler, and a chain connecting said carrier to the body of the car.

25. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and an automatic train-pipe coupler supported thereby, supplemental means secured to the car-body at each side of the car-coupler for supporting said carrier independently of said car-coupler and a chain connecting said train-pipe coupler to the body of the car.

26. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler and having transverse arms projecting therefrom, and an automatic train-pipe coupler supported thereby, supplemental means secured to the car-body at each side of the car-coupler which are adapted to be engaged by said carrier, and a chain connecting said carrier to the body of the car.

27. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and an automatic train-pipe coupler supported thereby, supplemental means connected to the car-body for supporting said carrier independently of said car-coupler, and a chain connecting said train-pipe coupler to the body of the car.

28. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and an automatic train-pipe coupler supported thereby, supplemental means secured to the car-body at each side of the car-coupler for supporting said carrier independently of said car-coupler and a chain connecting said train-pipe coupler to the body of the car.

29. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler and having transverse arms projecting therefrom, and an automatic train-pipe coupler supported thereby, supplemental means secured to the car-body at

each side of the car-coupler which are adapted to be engaged by said carrier, and a chain connecting said train-pipe coupler to the body of the car.

30. The combination with a car and a car-coupler, of a longitudinally-yielding automatically-returnable train-pipe coupler capable of movement at an angle to the line of draft of the car, a carrier therefor detachably secured to said car-coupler and means independent of said car-coupler for preventing the simultaneous accidental withdrawal of said carrier with said car-coupler from said car.

31. The combination with a car, and a car-coupler, of a longitudinally-yielding automatically-returnable train-pipe coupler capable of movement at an angle to the line of draft of the car, a carrier therefor non-shearably secured to and movable with said car-coupler, and supplemental means connected to and parallel with the car-body for supporting said carrier independently of said car-coupler.

32. The combination with a car, and a car-coupler, of a longitudinally-yielding automatically-returnable train-pipe coupler capable of movement at an angle to the line of draft of the car, a carrier therefor non-shearably secured to and movable with said car-coupler, and supplemental means secured to and parallel with the car-body at each side of said car-coupler for supporting said carrier independently of said car-coupler.

33. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and a longitudinally-yielding, automatically-returnable train-pipe coupler movable to a position at an angle to the line of draft of the car supported thereby, of a chain connecting said carrier to the body of the car.

34. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and a longitudinally-yielding, automatically-returnable train-pipe coupler movable to a position at an angle to the line of draft of the car supported thereby, of a chain connecting said train-pipe coupler to the body of the car.

35. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and a longitudinally-yielding, automatically-returnable train-pipe coupler movable to a position at an angle to the line of draft of the car supported thereby, supplemental means connected to the car-body for supporting said carrier independently of said car-coupler, and a chain connecting said carrier to the body of the car.

36. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and a longitudinally-yielding, automatically-returnable train-pipe coupler movable to a position at an angle to the line

of draft of the car supported thereby, supplemental means secured to the car-body at each side of the car-coupler for supporting said carrier independently of said car-coupler and a chain connecting said train-pipe coupler to the body of the car.

37. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler and having transverse arms projecting therefrom, and a longitudinally-yielding, automatically-returnable train-pipe coupler movable to a position at an angle to the line of draft of the car supported thereby, supplemental means secured to the car-body at each side of the car-coupler which are adapted to be engaged by said carrier, and a chain connecting said carrier to the body of the car.

38. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler, and a longitudinally-yielding, automatically-returnable train-pipe coupler movable to a position at an angle to the line of draft of the car supported thereby, supplemental means connected to the car-body for supporting said carrier independently of said car-coupler, and a chain connecting said train-pipe coupler to the body of the car.

39. The combination with a car, a car-

coupler, a carrier detachably secured to said car-coupler, and a longitudinally-yielding, automatically-returnable train-pipe coupler movable to a position at an angle to the line of draft of the car supported thereby, supplemental means secured to the car-body at each side of the car-coupler for supporting said carrier independently of said car-coupler and a chain connecting said train-pipe coupler to the body of the car.

40. The combination with a car, a car-coupler, a carrier detachably secured to said car-coupler and having transverse arms projecting therefrom, and a longitudinally-yielding, automatically-returnable train-pipe coupler movable to a position at an angle to the line of draft of the car supported thereby, supplemental means secured to the car-body at each side of the car-coupler which are adapted to be engaged by said carrier, and a chain connecting said train-pipe coupler to the body of the car.

In testimony whereof I have hereunto set my hand and seal this 21st day of July, A. D. 1906.

FRANK H. RUTHERFORD. [L. s.]

Witnesses:

FRANK D. THOMASON,
E. K. LUNDY.