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E. A. ROBINSON

AUTOMATIC TRAIN PIPE CONNECTER

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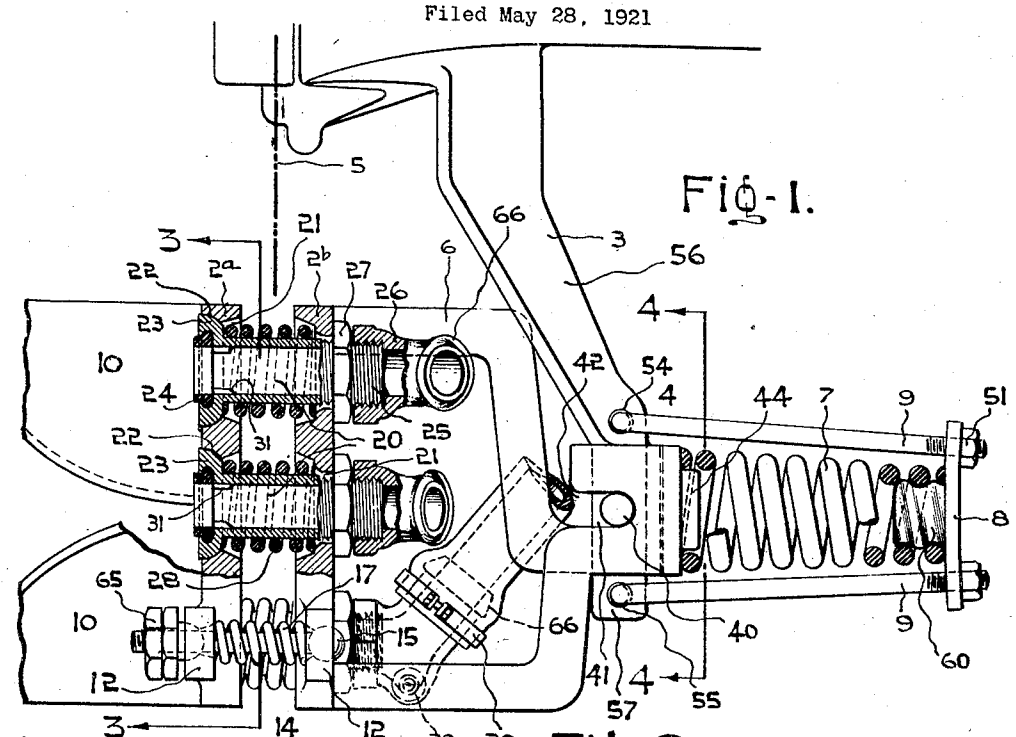


Fig-1.

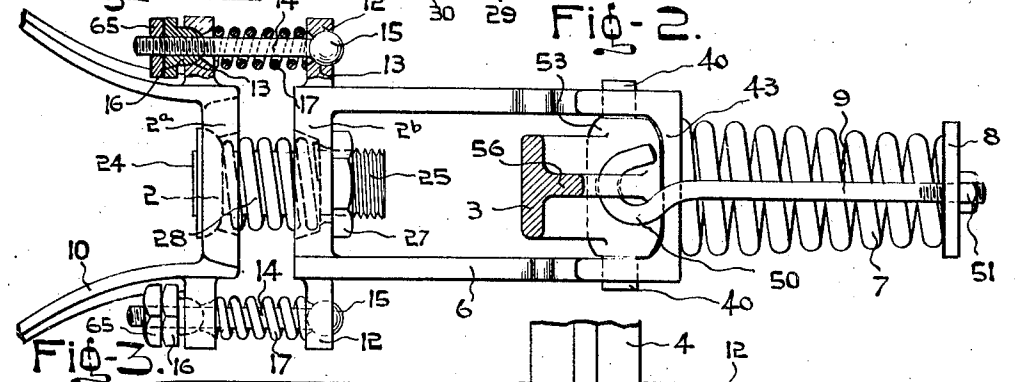


Fig-2.

Fig-3.

Fig-4.

Edward A. Robinson
Inventor.

Attorney.

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UNITED STATES PATENT OFFICE.

EDWARD A. ROBINSON, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR TO HIMSELF AND ELLISON EDWARD WORKMAN, OF MONTREAL, CANADA.

AUTOMATIC TRAIN-PIPE CONNECTER.

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My invention relates to means for automatically connecting the pipe lines of one railway car to another when the latter are coupled together.

Heretofore it has been extremely difficult with the type of connecters commonly employed to prevent leakage between the coupled connecters in transit, particularly when rounding sharp curves or when travelling over an uneven roadbed, and although this difficulty has practically been overcome by a number of constructions developed by me and disclosed in pending applications it is the object of the present invention to supplement these constructions by improvements which adapt the pipe terminals to universal angular motion with respect to the head and the head to universal angular motion with respect to its carriers in order to reduce to a minimum relative motion of the abutting pipe terminals during service.

A further object of the invention is to provide a construction and arrangement of parts which will enable each terminal or conduit to be directly connected to its train hose without employing a union or its equivalent. This construction reduces the number of joints or connections between the terminal or conduit and the fixed train pipe and consequently further assists in reducing possibility of leakage.

A further object of the invention is to provide improved means for supporting the connecter head with its terminals from the car coupler to assist in dissipating the shocks to which apparatus of this type is constantly subjected when in service, and to permit a wide range of movement.

For full comprehension, however, of my invention reference must be had to the accompanying drawings in which similar reference characters indicate the same parts, and wherein:

Figure 1 is a side elevation of a train pipe connecter constructed according to my invention and showing its application to a car coupler;

Figure 2 is a plan view thereof partly in horizontal section;

Figure 3 is a vertical sectional view taken on line 3—3 of Figure 1 and looking in the direction indicated by the arrows; and

Figure 4 is a vertical sectional view taken on line 4—4 of Figure 1 and looking in the direction of the arrows.

Although my invention as illustrated is embodied in a train pipe connecter having particular application to passenger cars in that such connecter is adapted to effect connection between three train pipe lines, it may also be embodied with equal resultant efficiency in train pipe connecters for freight cars and the like having a lesser number of pipe lines. The embodiment illustrated may also be modified without losing the essence of the invention which lies in the construction and arrangement of the parts enabling the train pipe terminals or conduits carried by the head to maintain constant axial alignment with the conduits of a counterpart head when coupled thereto and the front faces of such heads to maintain their intimate relative parallel positioning as efficiently when rounding an abrupt curve as when travelling in a straight line, thereby practically eliminating leakage at these connections.

The construction of the drawings includes a head 2, a bracket 3 secured at its upper end to the car coupler, the plane of the pulling face of the cars being illustrated diagrammatically as at 5, and a carrier 6 supporting the head and in turn being supported by the bracket. The buffer spring 7 bears between a plate 8 and the rear of the carrier the plate being detachably connected to the bracket by bolts 9.

The connecter head comprises two spaced parallel members of plate form the front member being indicated at 2^a and the rear member at 2^b. The former is provided with the usual horns 10 arranged on opposite sides thereof and staggered relatively to each other. This member is constructed and arranged to have universal movement upon the rear member for the purpose of providing the pipe terminals with universal lateral freedom of motion and thereby eliminating leakage between the coupled connecters.

The means effecting the universal connection between the members of the head is located at each side thereof and directly in rear of the horn on that side. Each connection consists of a pair of horizontally aligned laterally projecting lugs 12

formed integrally with the respective head members and having openings therethrough presenting ball-sockets 13 through which extends a bolt 14 having a head 15 and nut 16 each of ball form and seated in the sockets, the nut being secured by a lock nut 65. Bearing between the lugs and encircling the bolts are helical springs 17, one about each bolt. They are adapted to yieldingly resist relative movement of the members towards each other. The members are thus free to move laterally with respect to one another in any direction, being connected by ball and socket joints to opposite ends of the linking bolts 14.

The conduits or pipe terminals, of which in the embodiment illustrated there are three, are indicated at 20 and are of sleeve form and extend through horizontally aligned openings 21 in the head members, each being adapted to have universal angular movement therein with respect to the head members. To this end the mouth of each opening in the front member 2^a is concaved as at 22 to constitute a socket for the front end of the conduit which is of increased diameter and of substantially ball form as indicated at 23. Each terminal rigidly carries an annular gasket 24 adapted to protrude therefrom. The conduit extends a short distance rearwardly beyond the rear member 2^b and is threaded as at 25 to receive the train pipe fitting 26 and a lock nut 27, the nut and enlarged front end of the conduit limiting separation of the members of the head. The openings 21 are flared at their inner ends to provide freedom of movement of the conduits and also to accommodate springs 28 which encircle the latter and bear between the front ends thereof and the rear member. These springs yieldingly maintain the conduits in position perpendicular to the rear member with the nuts 27 bearing against the rear face thereof when in uncoupled position and also assist in maintaining the gaskets in tight contact with the gaskets of the counterpart head when coupled.

These conduits are independently rotatable within the head for the purpose of eliminating the necessity of employing unions or fittings of the Westinghouse, Gould and other similar types which function as unions in the connections to the pipe lines in rear of the head. Each conduit is adapted to be screwed into or onto one end of an elbow 26, the other end of the elbow being provided with a circumferential bead 66 and adapted to be clamped in the adjacent end of the hose as at 29, the elbow on the steam line being provided with a condensation outlet 30.

Any means may be employed for rotating the conduit without departing from the spirit of my invention. In the embodiment illustrated each conduit at its front end directly in rear of its gasket is provided with a pair of diametrically oppositely disposed lugs 31 which may be straddled by a suitable wrench adapted to be inserted through the front end of the conduit.

The carrier 6 is preferably constructed in the form of a yoke to provide sufficient clearance for the flexible train pipes and it is supported upon the lower end of the bracket in position straddling the same with its arms extending forwardly and rigidly fastened to opposite sides of the rear member 2^b of the head, the arms being offset in opposite vertical directions to locate their points of connection to the head in line with the horns 10. In the construction illustrated the yoke is shown integral with the rear member 2^b but this condition of integrality is not material.

Vertical displacement of the carrier upon the bracket is prevented by lugs 40 extending from opposite sides of the latter and projecting through slots or guideways 41 presenting open mouths 42 and constituted by terminating the rear ends of the yoke arms in hooked form. The transverse wall 43 which unites such ends is located immediately in rear of the bracket. It bears thereagainst and serves as a seat for the front end of the buffer spring 7 such seat being provided with a central rearward extension 44 to maintain the spring thereon. The bearing for the opposite end of the spring is effected by the bearing plate 8 fastened to the bracket by the bolts 9 positioned on opposite sides of the spring in the vertical axial plane thereof and having hooked ends 50 for detachable engagement with the bracket their other ends being screw-threaded to receive nuts 51 which bear against the plate 8 and enable the compression of the buffer spring to be varied. This face of this plate in engagement with the spring is provided with a threaded plug 60 formed integrally therewith the plug being of a diameter and its thread being of a pitch to fit the spring and prevent displacement of the latter relatively to the plate.

Heretofore, in supporting the connecter from a car coupler, it has been the practice to cast a lug upon the draw bar and bolt the connecter bracket to this lug with the result that the bolts were apt to work loose and the bracket being manufactured as an independent part added considerably to the total cost. To overcome these defects the bracket in the present invention is cast integrally with the draw-bar thereby eliminating any necessity for bolts and enabling it to be cast with the draw-bar with little addition to the cost of manufacturing the latter.

This bracket in the main is of T cross-section while its lower portion which is straddled by the carrier is of solid block construction as indicated at 53. The hooked

bolt ends are accommodated by openings 54 and 55 respectively located in the bracket flange 56 extending from the block to the upper end of the bracket and in a depending lug 57 on the underside of the block.

A connecter having embodied therein the essence of the present invention secures the following advantages:

(*a*) Universal angular play of the terminals is provided without necessity for any other joint than that at the rear of the terminals connecting with the train pipe.

(*b*) The springs between the two head members give a resilience to the head independently of the resilience offered by the springs about the terminals providing for head movement before the buffer spring is affected.

(*c*) The terminals are given universal play permitting movement of the front portion of the head in addition to the movement involving rocking of the yoke for which compression of the buffer spring provides.

(*d*) The springs between the parts of the head member maintain it in constant engagement with the outer flanges upon the terminals.

(*e*) Along with universal angular play for the terminals the head controls them so that they all move in the same direction and to the same extent, though each is free to act within a slight limit of play to adjust to its mating terminal.

What I claim is as follows:

1. In an automatic train pipe connecter, a connecter head having a passage through the head, a conduit located in the passage passing through the head for connection at the rear with the train pipe and having its forward end adapted to engage by a butt joint with a corresponding conduit in a counterpart head and cooperative mounting between the conduit and the head whereby the conduit is adapted to swing bodily in variant directions to accommodate the front end of the conduit to coact with the corresponding conduit of the counterpart head.

2. In an automatic train pipe connecter, a head, a conduit extending therethrough for engagement with a counterpart conduit at the front and engagement with a train pipe connection at the rear and mounted in the head to swing in different directions, in combination with a carrier for the head and a bracket and connections for supporting said carrier.

3. In an automatic train pipe connecter, a bracket, a head, connections between the head and bracket resiliently supporting the head to provide for swinging movement of the head in all directions and normal return to a predetermined initial position, in combination with a conduit extending through the head and having universal movement therein and a fitting secured to the rear of the conduit for connection with a train pipe.

4. In an automatic train pipe connecter a head comprising two relatively movable parts and a conduit mounted in said parts and capable of universal movement relatively thereto.

5. In an automatic train pipe connecter a head comprising two relatively movable parts and a conduit mounted in said parts and capable of universal movement relatively thereto, and means for yieldingly resisting relative movement between the said parts.

6. In an automatic train pipe connecter, a two-part connecter head, means effecting a universal connection between the parts whereby one may have universal movement upon the other, and a conduit mounted within the head and capable of universal movement therein.

7. In an automatic train pipe connecter, a two-part head, one part being capable of wide universal movement relatively to the other, means for yieldingly resisting relative movement between the parts, and a conduit extending through said parts and supported thereby.

8. In an automatic train pipe connecter, a two-part head, a plurality of conduits mounted in said parts and springs bearing between said parts and encircling said conduits, one part being supported by and capable of universal movement relatively to the other part.

9. In an automatic train pipe connecter, a two-part connecter head, a conduit extending through said parts and supported thereby, a spring encircling said conduit and bearing between said parts and means upon opposite ends of the conduit for limiting separation of the said parts, said conduit being capable of universal movement within the head.

10. In an automatic train pipe connecter, a two-part connecter head having a front face member adapted to engage the face of a mating head and a rear supporting member, spring connection between the two members permitting movement of one with respect to the other in all directions and a plurality of conduits mounted to have universal movement in the front member and projecting through the rear member, springs about the conduits independently pressing them forward and stops limiting the forward projection of the conduits.

11. In an automatic train pipe connecter, a two-part head, one part having a ball-socket therein and being supported by and capable of universal movement relatively to the other part and a conduit extending through said parts and supported thereby, one end of said conduit being of substantially ball-form and seated in said ball-

socket and the opposite end having freedom of movement in the other part.

12. In an automatic train pipe connecter, a two-part head, one part having a ball-socket therein and being supported by and capable of universal movement relatively to the other part, a conduit extending through said parts and supported thereby, one end of said conduit being of substantially ball-form and seated in said ball-socket and the opposite end having freedom of movement in the other part and means resiliently maintaining the conduit and parts in their normal relative positions.

13. In an automatic train pipe connecter, a two-part head, one part having a ball-socket therein and being supported by and capable of universal movement relatively to the other part, a conduit extending through said parts and supported thereby, one end of said conduit being of substantially ball-form and seated in said ball-socket and the opposite end having freedom of movement in the other part and a spring encircling said conduit and adapted to yieldingly resist movement thereof, relatively to the head.

14. In an automatic train pipe connecter, a head comprising front and rear parts interconnected and capable of universal movement relatively to each other and having axially aligned openings, the opening on the front part presenting a ball-socket, a conduit extending through the openings in the parts and supported by the latter, the front end of said conduit being of substantially ball-form and seated in said ball-socket and the rear end extending rearwardly of the rear part and screw-threaded, a nut screwed upon said end, and means resiliently maintaining the conduit and parts in their normal relative positions.

15. In an automatic train pipe connecter, a head comprising front and rear parts interconnected and capable of universal movement relatively to each other and having axially aligned openings, the opening in the front part presenting a ball-socket, a conduit extending through the openings in the parts and supported by the latter, the front end of said conduit being of substantially ball-form and seated in said ball-socket and the rear end extending rearwardly of the rear part and screw-threaded, a nut screwed on said end, and a spring encircling the conduit and bearing between the front end thereof and the said rear part.

16. In an automatic train pipe connecter, a head comprising front and rear parts, means effecting a connection between the parts permitting relative universal movement, means yieldingly resisting relative movement between the parts, the opening in the front part presenting a ball-socket, a conduit extending through the openings in the parts and supported by the latter, the front end of said conduit being of substantially ball-form and seated in said ball-socket and the rear end extending rearwardly of the rear part and screw-threaded, a nut screwed upon said end, and means resiliently maintaining the conduit and parts in their normal relative positions.

17. In an automatic train pipe connecter, a two-part head, one part being capable of universal movement relatively to the other, a conduit extending through said parts and supported thereby, and means for supporting and adjusting one part relatively to the other.

18. In an automatic train pipe connecter, a two-part head, one part being capable of universal movement relatively to the other, a conduit extending through said parts and supported thereby, means for supporting and adjusting one part relatively to the other and means for adjusting the conduit relatively to the parts.

19. In an automatic train pipe connecter, a head consisting of spaced front and rear parts, a conduit separate therefrom and extending through said parts and supported thereby and means effecting a universal connection between the parts, said means consisting of devices extending between the parts and disposed parallel to the conduit on opposite sides of the vertical axial plane thereof and ball-and-socket connections between the ends of the devices and the parts.

20. In an automatic train pipe connecter, a head consisting of front and rear parts, a conduit extending through said parts and supported thereby and means effecting a universal connection between the parts, said means consisting of laterally projecting lugs upon said parts, the lugs on one part being in horizontal alignment with those on the other part and all having ball-sockets, bolts extending through said sockets and having heads of ball-form seated in the sockets of one part and nuts of substantially ball-form seated in the sockets on the other part, and springs encircling the bolts and bearing between the lugs.

21. In an automatic train pipe connecter, a head consisting of spaced front and rear parts, a conduit extending through said parts and supported thereby, the front end of the conduit being of substantially ball-form and seated in a socket in the front part, means upon the rear end of the conduit for preventing complete displacement thereof from the parts, and spring encircling said conduit and bearing between the front end thereof and the rear part, and means effecting a universal connection between the parts, said means consisting of bolts extending between the parts and disposed parallel to the conduit on opposite sides of the vertical axial plane thereof and

ball-and-socket connections between the ends of the bolts and the parts.

22. In an automatic train pipe connecter, a head consisting of spaced front and rear parts, a conduit extending through said parts and supported thereby, the front end of the conduit being of substantially ball-form and seated in a socket in the front part and the opposite end extending rearwardly of the rear part and having a nut screwed thereon, a spring encircling said conduit and bearing between the front end thereof and the rear part, and means located on opposite sides of the vertical axial plane of the conduit and effecting a universal connection between the parts, said means consisting of laterally projecting lugs upon said parts, the lugs on one part being in horizontal alignment with those on the other part and all having ball-sockets, bolts extending through said lugs and having heads of substantially ball-form seated in the lugs of one part and having nuts of substantially ball-form screwed upon their opposite ends and seated in the lugs on the other part, and springs encircling the bolts and bearing between the lugs.

23. In an automatic train pipe connecter, a head consisting of front and rear parts, said front part having horns on opposite sides thereof and in staggered relation with each other, a conduit separate from the parts extending through said parts and a universal connection between the parts at each side thereof and in line with the horn on that side.

24. In an automatic train pipe connecter operating in conjunction with a car coupler, a bracket adapted to be secured to the car coupler, a head consisting of front and rear parts, one being capable of universal movement relatively to the other, a conduit extending through said parts, a carrier rigidly connected to said rear part and supported upon said bracket and capable of movement relatively thereto, a buffer spring having one end in bearing relation with said carrier and adapted to yieldingly resist said relative movement of the carrier, and means in bearing relation with the opposite end of the spring and connected to the bracket.

25. In an automatic train pipe connecter of the type operating in conjunction with a car coupler, a bracket adapted to be secured to the coupler at its upper end and having laterally projecting guides on opposite sides of its lower ends, a head consisting of front and rear parts, one part being capable of universal movement relatively to the other, a conduit extending through said parts and capable of universal movement therein, a carrier connected to said rear part and straddling the lower end of the bracket, said carrier having guideways receiving said guide, a buffer spring located in rear of the bracket and having its front end bearing against the carrier, means bearing against the rear end of the spring and secured to the bracket, said means consisting of a bearing plate and tie bolts connected thereto at their rear end and having their forward ends hooked for engagement with the bracket.

26. In an automatic train pipe connecter of the type operating in conjunction with a car coupler and in a plane parallel to the horizontal plane of a car coupler, a bracket adapted to be secured to the coupler at its upper end and having laterally projecting guides on opposite sides of its lower end, a head consisting of front and rear parts of substantially plate form, means located at opposite sides of the head for universally connecting the parts thereof together, a conduit extending through said parts and capable of universal movement therein with respect to the parts, a carrier consisting of a yoke straddling the lower end of the bracket in the rear thereof and having its arms rigidly connected to the rear part of the head on opposite sides thereof and adjacent the means universally connecting the parts of the head together, said carrier having guideways receiving said guides, a buffer spring located in rear of the bracket and having its front end bearing against the carrier, means bearing against the rear end of the spring and secured to the bracket, said means consisting of a bearing plate and tie bolts connected thereto at their rear ends and having their forward ends hooked for engagement with the bracket.

27. In an automatic train pipe connecter, a two-part head, resilient support for one part from the other providing for movement of one in lateral directions with respect to the other, conduits passing through both parts of the head and resiliently supported independently of the connection between the two parts of the head, a bracket and resilient connections mounting one part of the head to provide universal movement between it and the bracket.

28. In an automatic train pipe connecter, a two-part connecter head, resilient support for one part of the head in front of the other, conduits extending through the heads and having universal movement with respect to the forward part of the head, a yoke supporting the rear part of the head, a bracket and resilient connections between the bracket and yoke.

29. In an automatic train pipe connecter, a two-part head, one part being capable of universal movement relatively to the other part, and a conduit rotatably mounted within said head and having its rear end protruding therefrom for connection with a

train pipe fitting said conduit having means enabling it to be rotated for the purpose of securing it to the fitting.

30. In an automatic train pipe connecter, a two-part head, one part being capable of universal movement relatively to the other part, and a conduit rotatably mounted within said head and having its rear end protruding therefrom for connection with a train pipe fitting said conduit having means enabling it to be rotated for the purpose of securing it to the fitting, said last-mentioned means consisting of inward projections upon the inner face of the conduit adjacent its front end.

31. In an automatic train pipe connecter, a member carrying forwardly projecting horns on opposite sides thereof and a second member supporting said first member, and permitting universal movement of the first-mentioned member said second member having a plate-like portion and a rearwardly projecting portion of yoke form the plate-like portion having the first member connected to it.

32. In an automatic train pipe connecter, a supporting member having forwardly projecting horns on opposite sides thereof, a carrier, means effecting a universal connection between the member and carrier, and a conduit extending through said member and separate from the member and carrier.

In testimony whereof I have signed my name to this specification.

EDWARD A. ROBINSON.