July 30, 1935. H. F. WOERNLEY 2,009,830

AUTOMATIC TRAIN PIPE COUPLING

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Fig. 1.

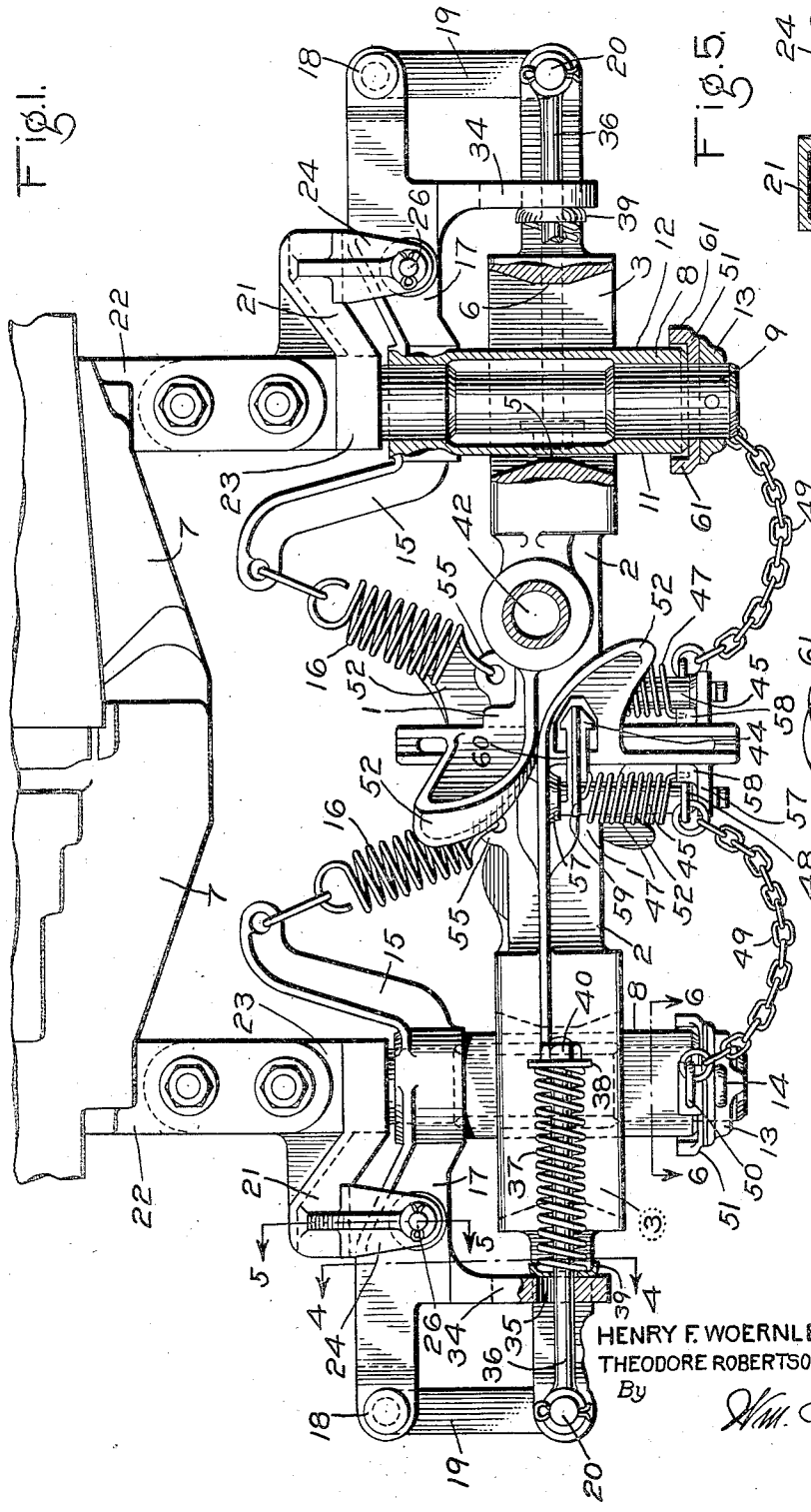


Fig. 5.

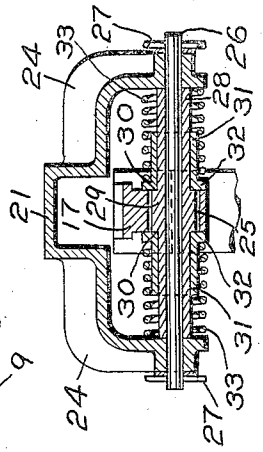
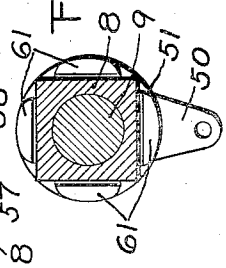


Fig. 6.



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Fig. 2.

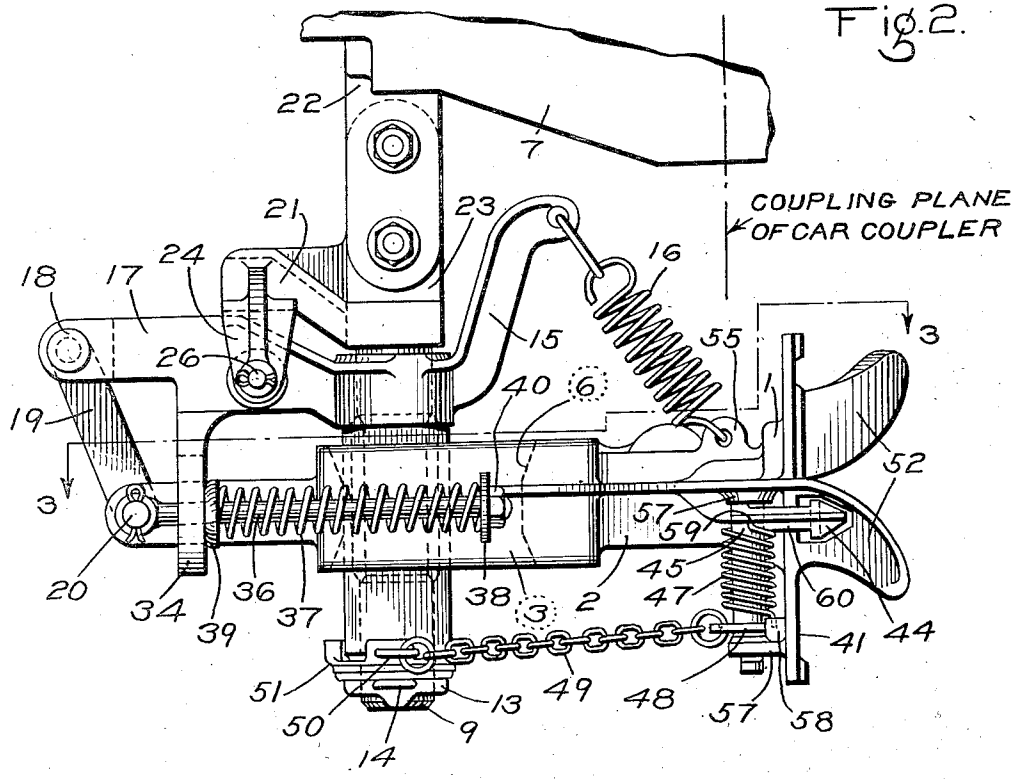


Fig. 3.

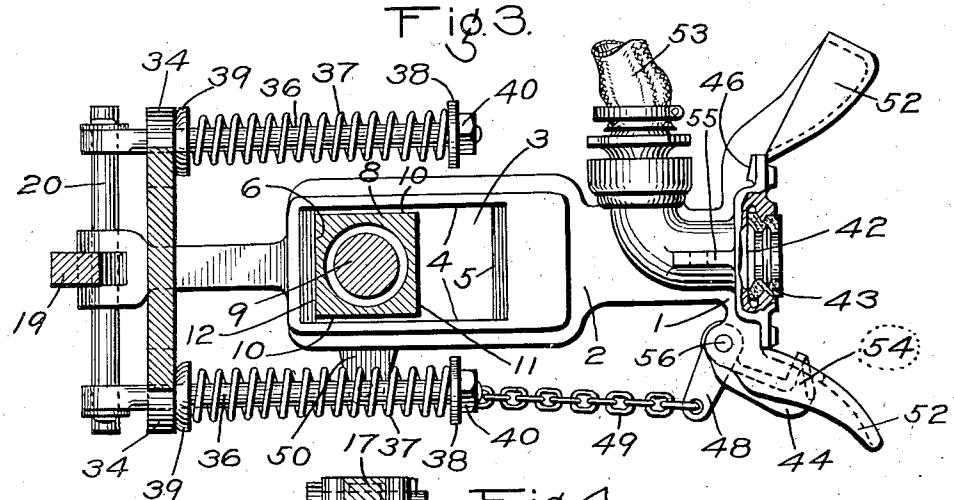
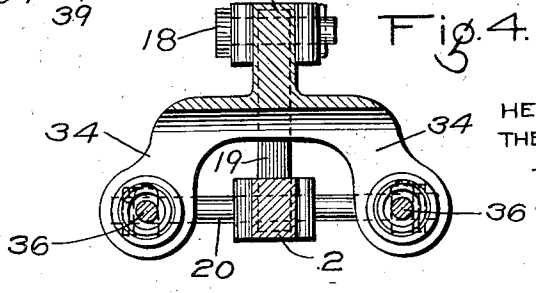


Fig. 4.



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AUTOMATIC TRAIN PIPE COUPLING

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4 Claims. (Cl. 285—58)

This invention relates to train pipe couplings and has for its principal object to provide an improved train pipe coupling of the type in which the train pipe coupling is associated with the car coupler and is adapted to automatically couple with a counterpart coupling in advance of the coupling of the car coupler with its counterpart coupler.

Other objects and advantages will appear in the following more detailed description of my invention.

In the accompanying drawings; Fig. 1 is a side elevation of a pair of train pipe couplings coupled together, embodying the invention; Fig. 2 is a side elevation of a train pipe coupling of the type shown in Fig. 1, showing the coupling in the uncoupled position; Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2; Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1; Fig. 5 is a sectional view taken on the line 5—5 of Fig. 1; and Fig. 6 is a sectional view taken on the line 6—6 of Fig. 1.

As shown in the drawings, each train pipe coupling comprises a coupling head 1 having a rearwardly extending shank 2, which is provided with a vertical longitudinal slot 3 defined by the side walls 4 and by the end walls 5 and 6, at the front and rear, respectively, of the slot.

The train pipe coupling is disposed beneath the usual car coupler 7. Depending from the car coupler is a lug 22 to which is secured a member 23 having a trunnion 9 extending vertically downward.

Rotatably mounted on said trunnion is a sleeve 8 which is preferably square in cross section and has the two side faces 10 spaced apart a distance substantially equal to the distance between the side walls 4 of the slot 3, for causing the sleeve to rotate with the train pipe coupling. The two end faces 11 and 12 at the front and rear, respectively, of the sleeve are spaced apart a distance less than the distance between the end walls 5 and 6 of the slot, so as to permit longitudinal movement of the coupling relative to the sleeve.

For supporting the sleeve 8 on the trunnion 9, a collar 13 is provided, which is secured to the trunnion by any suitable means, such as a cotter pin 14.

Carried by the sleeve 8 is a forwardly extending arm 15. To the arm 15 is connected one end of a tension spring 16, the other end of said spring being connected to a suitable lug 55 on the coupling head 1, for yieldingly suspending said head from the arm 15.

An arm 17 carried by the sleeve 8 extends rearwardly, the end of said arm being pivotally connected by means of a pin 18, to one end of a link 19, the other end of said link being pivotally connected by a pin 20 to the inner end of the shank portion 2 of the train pipe coupling, for supporting the rear end of said coupling.

Thus, the coupling is free to swing longitudinally with respect to the car coupler because the vertically disposed sleeve 8 is free to move longitudinally in the slot 3 and because the pivoted link 19 and the spring 16, for supporting the coupling, permit of such movement. The coupling is rotatable in a horizontal plane with the sleeve because the engagement of the squared sleeve in the slot 3 prevents rotation of the sleeve relative to the coupling. The coupling, being supported at the front end by the spring 16 and at the rear end by the pivoted link 19, is also adapted to move vertically.

Means are also provided for normally maintaining the coupling in longitudinal alignment with the coupler, which means comprises an arm 21 extending rearwardly from the member 23 and disposed above the arm 17. The arm 21 is provided with two oppositely disposed arms 24 which extend laterally of the arm 17, the end of one arm 24 being disposed at one side of the arm 17 and the end of the other arm 24 being disposed at the opposite side of the arm 17.

As shown in Fig. 5, the arm 17 is provided with an opening 25. Extending through said opening and carried by the arms 24 is a pin 26 which is secured to said arms by the cotter pins 27. Loosely mounted on said rod is a sleeve 28, which may be a neat fit between the ends of the arms 24 and which may have an enlarged central section 29 which is substantially equal in length to the distance between the side faces of the arm 17, the ends of said enlarged section forming the annular shoulders 30. Slidably mounted on the sleeve 28 are the sleeves 31, having the flanges 32. For urging the sleeves 31 into engagement with the respective side faces of the arm 17 and with the respective shoulders 30, springs 33 are provided, which are initially under compression between the flanges 32 and the ends of the arms 24. Thus, the springs 33, being opposed to each other, tend to normally maintain the arm 17, and therefore the sleeve 8 and the coupling head 1, in longitudinal alignment with the car coupler, so that when two couplings are brought together for coupling, they will be in a position which will permit coupling.

As shown in Fig. 2, the train pipe coupling head is normally maintained in a position forward of

the coupling plane of the car coupler, so that said head will automatically couple to the adjacent counterpart train pipe coupling when two adjacent cars are brought together for the purpose of coupling. This feature is accomplished by means which will now be described.

Projecting laterally from the arm 17 are two oppositely disposed arms 34, the end of one arm being disposed at one side of the coupling and the end of the other arm being disposed at the opposite side of the coupling. Each arm 34 has an opening 35 therethrough.

Extending loosely through the opening 35 in each arm 34 is a rod 36 which has one end pivotally mounted on the pin 20. A coil spring 37 is carried by each rod 36, being placed under initial compression between a washer 38 at the forward end of said rod and a spring seat 39, which is in slidable engagement with the arm, by means of a nut 40 screw-threaded to the forward end of said rod. The spring 37, being under initial compression, holds the coupling in a forward position defined by the engagement of the rear wall 6 of the slot 3 with the rear face 12 of the sleeve 8 when the coupling is uncoupled from a counterpart coupling, as shown in Figs. 2 and 3, in which position the coupling face 41 is forward of the coupling plane of the car coupler.

The coupling head 1 has formed therein one or more train pipe passages, each of which terminates, at one end, in the coupling face 41 and which connects, at the other end, with the train pipe hose 53. In the present instance, the coupling head is shown as having a train pipe passage 42 provided with a gasket 43 where each passage terminates, which is adapted to abut against a corresponding gasket in the train pipe passage in the counterpart coupling head when the two heads are coupled, for making a fluid-tight joint.

Each train pipe coupling head is provided with a latch 44 which is pivotally carried at one side of the longitudinal axis thereof, and with a shoulder or latching surface 46 at the opposite side of said axis, the latch of one coupling being adapted, in the act of coupling, to ride over and lock onto the latching surface of the counterpart coupling for locking said couplings in the coupled position. The latch 44 is in the form of an arm secured to a sleeve 45. The sleeve 45 is rotatably mounted on a pin 56 which is carried by two spaced lugs 57 projecting from the side of the coupling head. Surrounding the sleeve 45 is a torsional spring 47 at all times under strain, one end of which spring is secured to a lug 58 on the side of the coupling head, while the other end is secured to a lever arm 59 projecting from the body 60 of the latch 44, so that said spring at all times urges the latch 44 in such a direction as to effect automatic engagement of said latch with the latching surface 46 of the counterpart coupling in coupling.

For pulling said latch out of locking engagement with the latching surface 46 of the counterpart coupling when it is desired to effect an uncoupling, a lever 48 carried by the sleeve 45 is connected by means such as a chain 49 to an arm 50 on a member 51 which is interposed between the sleeve 8 and the collar 13. When two cars move apart after uncoupling of the car couplers has been effected, the chain is pulled taut, so as to rotate the sleeve 45 and thereby release the coupling latch 44 from engagement with the latching surface 46, which will permit automatic uncoupling of the train pipe couplings.

The member 51 is mounted on the trunnion 9 between the collar 13 and the lower end of the sleeve 8 and is provided with spaced lugs 61 adapted to engage the four faces on the sleeve 8, as shown in Fig. 6, so that the member 51, and therefore the arm 50, rotates with the sleeve 8 relative to the trunnion 9. Since the arm 50 rotates with the sleeve 8 and since the coupling head also rotates with the sleeve, there will be no rotative movement of the coupling head relative to the arm 50, which would otherwise tend to cause the stretching of the chain and the consequent release of the latch when two coupled heads rotate horizontally with respect to the trunnions, as in rounding a curve.

The coupling head is provided with two oppositely disposed forwardly projecting horns 52. These horns flare outwardly in such a manner as to guide two counterpart coupling heads into proper coupling relation in the act of coupling.

In operation, when two cars are being brought together for the purpose of coupling, the horns 52 engage and guide the two adjacent train pipe coupling heads into the proper relation, in the usual well known manner, causing the counterpart conduit gasket rings 43 in the coupling face of the coupling heads to engage. As the cars continue to move toward each other, each coupling head is moved rearwardly relative to the sleeve 8 and the trunnion 9 against the yielding resistance of the springs 37, causing the opposing gasket rings 43 to be compressed, so as to form a leak-proof seal. This rearward movement of the coupling head causes the chain 49 to become slack, with the result that the force of the torsional spring 47 snaps the tapered nose 54 of the latch 44 into locking engagement with the latching surface 46 of the counterpart coupling head.

After the train pipe couplings have been coupled, further movement of the respective cars toward each other will cause the car couplers to couple, and during this movement the train pipe couplings will continue to move rearwardly relative to the respective trunnions until, with the car couplers coupled, the coupling plane of the train pipe couplings substantially coincides with the coupling plane of the car couplers. The springs 37 of the opposing coupling heads will then act to yieldingly maintain the heads in this position.

Since the coupling is adapted to move longitudinally relative to the sleeve 8 and is also adapted to swing laterally on account of being pivotally carried by the trunnion 9, it will be evident that the coupling heads, when coupled, are free to swing laterally as a unit and to move longitudinally as a unit to allow for changes in position due to rounding curves and the like.

If it is desired to uncouple, the car couplers 7 are first uncoupled in the usual manner, after which the movement of the cars, as they separate, relative to the train pipe couplings, moves the trunnion 9, with the sleeve 8, and consequently the arm 50, to which one end of the chain 49 is fastened, rearwardly away from the train pipe coupling head 1. As the cars continue to move apart, the rearward movement of the sleeve 8 relative to the coupling head in the slot 3, and the consequent movement of the arm 50, will cause the chain to be stretched so as to release the latch 44 from the latching surface 46 on the counterpart coupling head, thereby releasing the coupling heads from locking engagement. As the cars move farther apart, the springs 37 will move the coupling head forward to the uncoupled

position, in which the rear wall 6 of the slot 3 engages the rear face 12 of the sleeve 8.

In the uncoupling operation just described, it will be evident that the latch 44 on both of the coupling heads will be operated and released at substantially the same time.

It will now be evident that there is provided an improved train pipe coupling mechanism which is automatic in coupling as well as being automatic in uncoupling.

While one illustrative embodiment of the invention has been described in detail, it is not the intention to limit its scope to that embodiment or otherwise than by the terms of the appended claims.

Having now described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. A support for a train pipe coupling from a car coupler comprising a vertically disposed trunnion carried by the car coupler, a sleeve rotatably mounted on said trunnion and carrying said train pipe coupling, said sleeve and said coupling having means providing longitudinal movement of the train pipe coupling relative to said sleeve, an arm carried by said sleeve, a rod slidably extending through an opening in said arm and operatively connected at one end to the rear end of the train pipe coupling, a spring seat carried at the opposite end of said rod, and a spring interposed between said arm and said spring seat, said spring being always under compression for yieldingly maintaining the train pipe coupling in the uncoupled position when not coupled to a counterpart train pipe coupling.

2. A support for a train pipe coupling from a car coupler comprising a vertically disposed trunnion carried by the car coupler, a sleeve rotatably mounted on said trunnion and carrying said train pipe coupling, said sleeve and said coupling having means providing longitudinal movement of the train pipe coupling relative to said sleeve, an arm carried by said sleeve and disposed at one side of the train pipe coupling, another arm carried by said sleeve and disposed at the opposite side of the train pipe coupling, and spring means carried by said arms and acting on the train pipe coupling for yieldingly maintaining the train pipe coupling in the uncoupled position when not coupled to a counterpart train pipe coupling.

3. A support for a train pipe coupling from a car coupler comprising a vertically disposed trunnion carried by the car coupler, a sleeve rotatably mounted on said trunnion and carrying said train pipe coupling, said sleeve and said coupling having means providing longitudinal movement of the train pipe coupling relative to said sleeve, an arm carried by said sleeve and disposed at one side of the train pipe coupling, another arm carried by said sleeve and disposed at the opposite side of the train pipe coupling, a rod slidably extending through an opening in one of said arms, another rod extending through an opening in the other of said arms, said rods being operatively connected at one end to the rear end of the train pipe coupling, a spring seat carried at the opposite end of each said rod, and a spring interposed between each said arm and each said spring seat, said spring being always under compression for yieldingly maintaining the train pipe coupling in the uncoupled position when not coupled to a counterpart train pipe coupling.

4. A support for a train pipe coupling from a car coupler comprising a vertically disposed trunnion carried by the car coupler, a sleeve rotatably mounted on said trunnion and extending through a slotted opening in the train pipe coupling, supporting means carried by said sleeve for supporting the forward end of the train pipe coupling, supporting means for supporting the rear end of the train pipe coupling comprising a member pivotally connected to said sleeve and to the rear end of said coupling, a pin for pivotally connecting said member to the train pipe coupling, said supporting means being adapted to provide for longitudinal movement of the train pipe coupling relative to said sleeve, an arm carried by said sleeve and disposed at one side of the train pipe coupling, another arm carried by said sleeve and disposed at the opposite side of the train pipe coupling, a rod slidably extending through an opening in one of said arms and operatively connected at one end to said pin, another rod slidably extending through an opening in the other of said arms and operatively connected at one end to said pin, a spring seat carried at the other end of said rods, and a spring interposed between each arm and each said spring seat, said spring being always under compression for yieldingly maintaining the train pipe coupling in the uncoupled position when not coupled to a counterpart train pipe coupling.

THEODORE ROBERTSON WOERNLEY,
Executor of the Last Will and Testament of Henry F. Woernley, Deceased.