J. V. ROBINSON.

AUTOMATIC INTERLOCKING TRAIN PIPE COUPLING.

APPLICATION FILED JULY 7, 1911. RENEWED MAY 1, 1917.

1,245,774.

Patented Nov. 6, 1917.

4 SHEETS—SHEET 1.

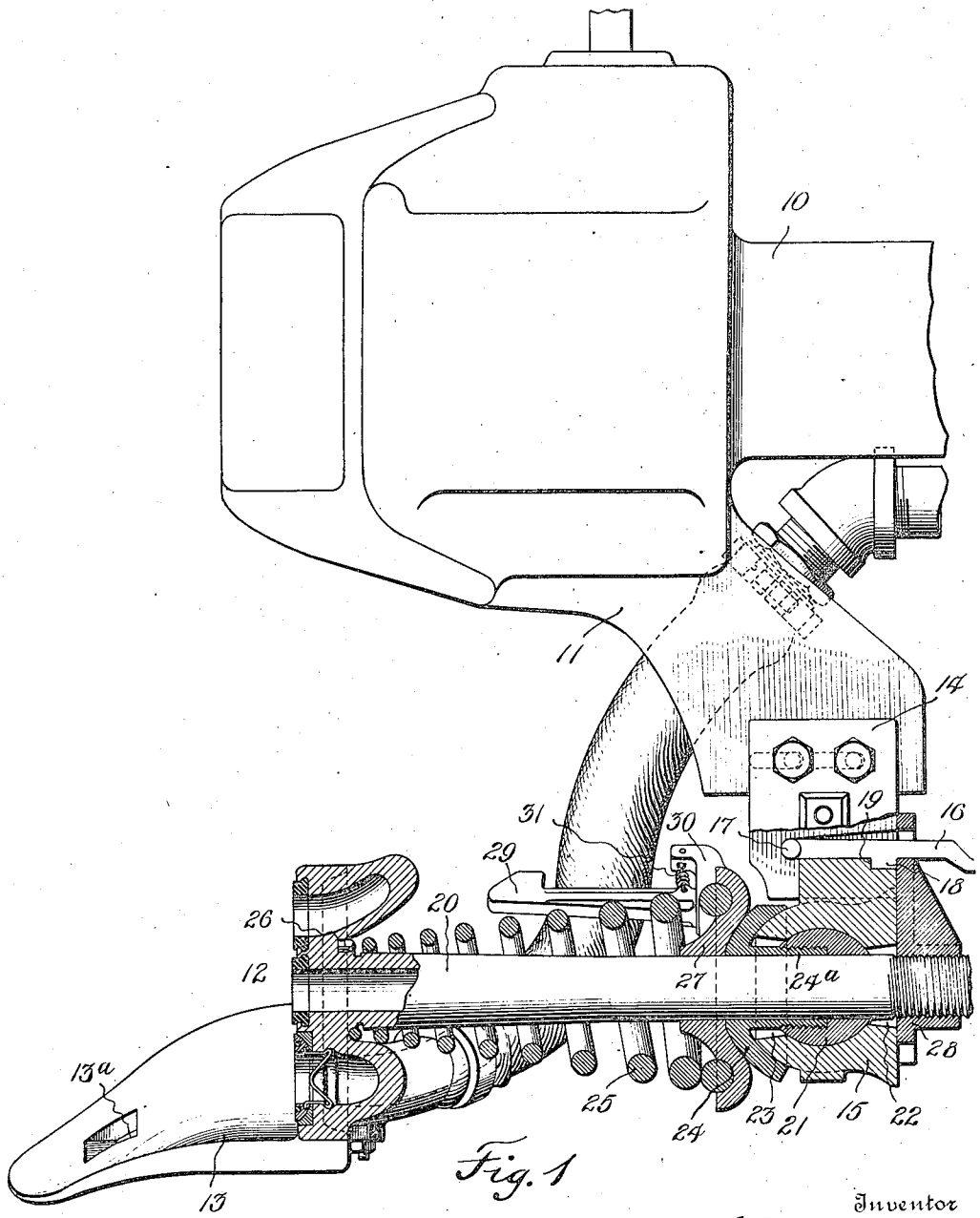

Fig. 1

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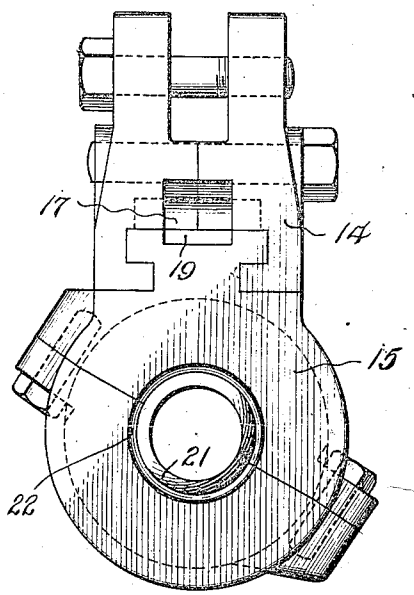

Fig. 2

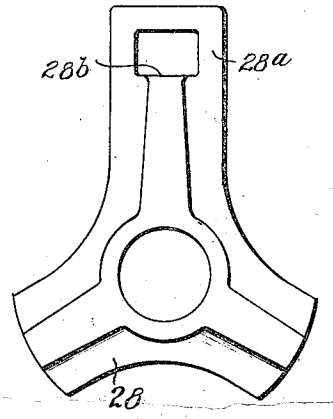

Fig. 3

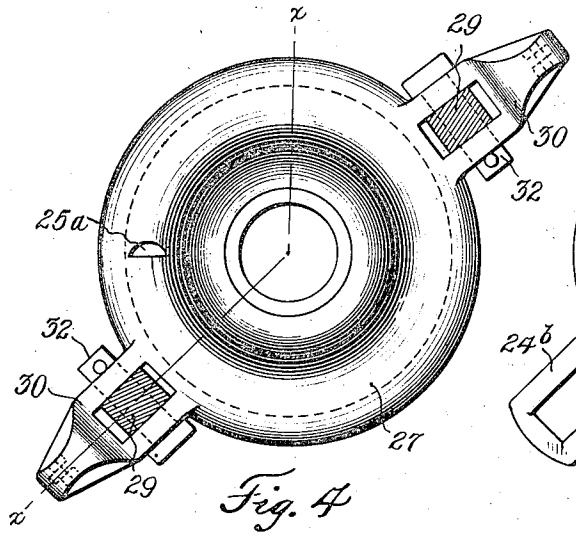

Fig. 4

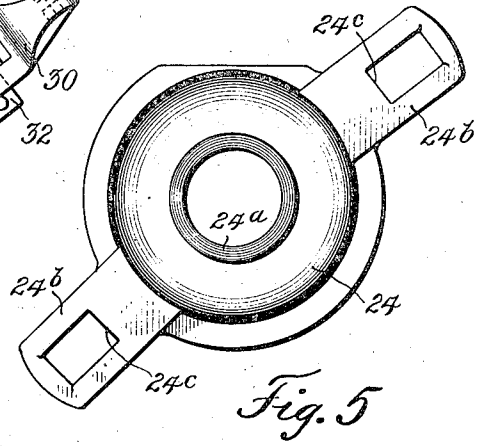

Fig. 5

Witnesses

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4 SHEETS—SHEET 3.

Fig. 6

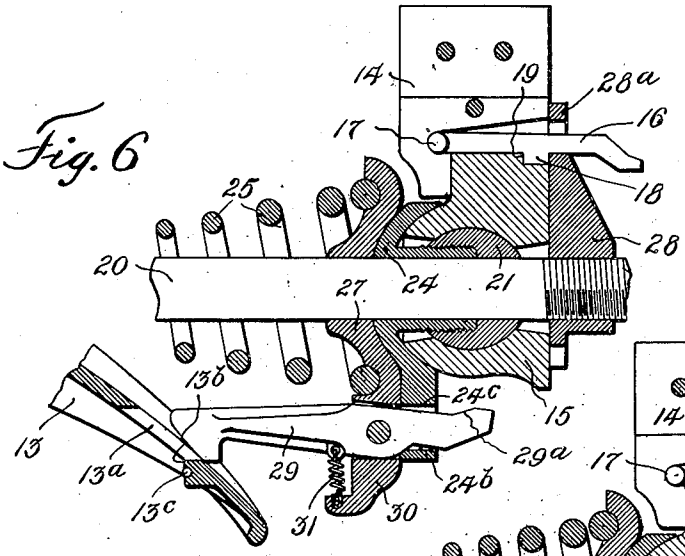


Fig. 7

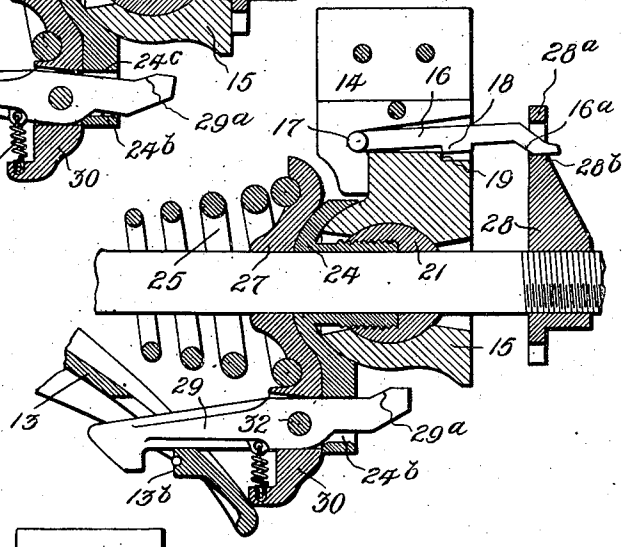
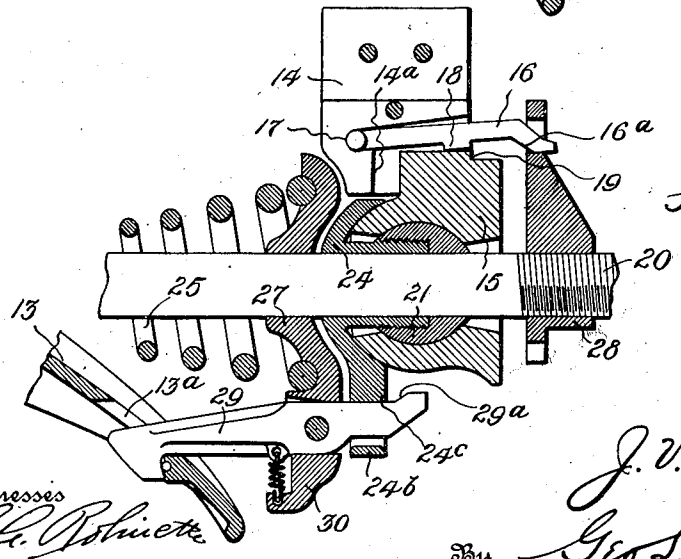


Fig. 8



Witnesses

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4 SHEETS—SHEET 4.

Fig. 9

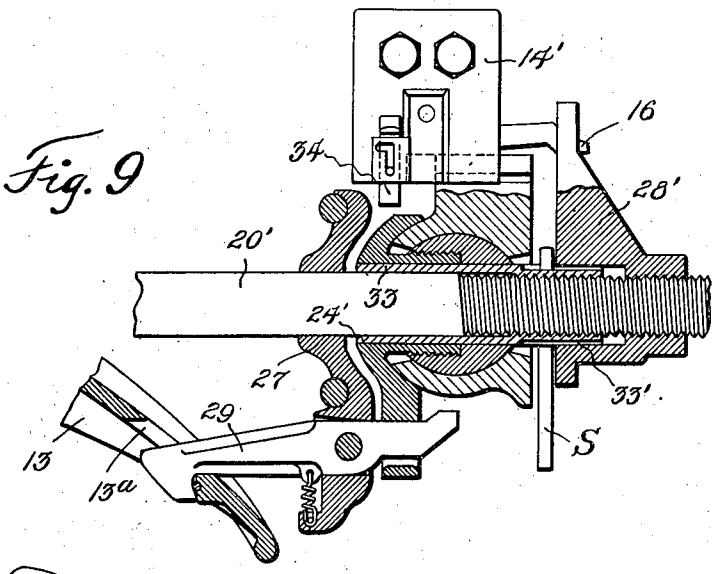

Fig. 11

Fig. 10

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UNITED STATES PATENT OFFICE.

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AUTOMATIC INTERLOCKING TRAIN-PIPE COUPLING.

1,245,774. Specification of Letters Patent. Patented Nov. 6, 1917.

Application filed July 7, 1911, Serial No. 637,323. Renewed May 1, 1917. Serial No. 165,797.

To all whom it may concern:

Be it known that I, JOSEPH V. ROBINSON, a citizen of the United States, and a resident of Branford, county of New Haven, State of Conn., have invented a new and useful Improvement in Automatic Interlocking Train-Pipe Couplings, of which the following is a specification.

This invention relates to means for automatically coupling the air and steam pipes of railway cars simultaneously with the operation of the draw bar couplers.

An object of the invention is to produce an improved train pipe coupler constructed to relieve its supporting member from the tension of the main spring when the cars are coupled, independent of the position of the draw bar in all conditions of service.

Another object is to produce an improved train pipe coupler provided with an abutment for the main spring constructed to move or shift from its normal position when the cars couple.

Another object is to provide means which will maintain coupled train pipe heads under a constant pressure during all conditions of service.

Another object is to provide means whereby the coupling heads may be separated and one or both thereof removed and replaced without disturbing the coupling at the draw bars.

The foregoing and other objects are carried out in a preferred manner by the mechanism hereinafter described and claimed and illustrated in the accompanying drawings, in which similar parts are referred to by like reference characters, and in which—

Figure 1 is a vertical longitudinal section of one form of the invention showing the parts in the normal uncoupled position; Fig. 2 is a rear elevation of the hanger; Figs. 3, 4, and 5 are like views respectively of the spider, the abutment, and the collar, described below; Figs. 6, 7, and 8 are diagrammatic representations of the relative longitudinal positions of the several parts when normally uncoupled, at maximum compression, and running, respectively, taken substantially on the line x—x of Fig. 4; Figs. 9 and 10 are views in different positions of a modified form of the device, and Fig. 11 indicates a form of spanner that may be employed therewith.

10 indicates any suitable form of draw bar. A bracket 11 is shown carried by the draw bar. A coupling head 12 having one or more conduits for air and steam is arranged to make suitable connection with a counterpart head carried by an adjacent car. Each coupling head, as usual, includes a pair of guides or gathering means 13. The hanger or support through which the coupling head is connected to the bracket comprises a relatively stationary member 14 clamped to the bracket, and also includes a movable member 15 slidable rearwardly with respect to the member 14. Means are provided to temporarily lock the movable supporting member to the member 14, which position is assumed in the normal uncoupled position and is so maintained until the cars are coupled and the tension spring 25 is placed under considerable pressure. Said locking means is indicated as a trigger 16 pivoted to one of the hanger members at 17 and having a lug 18 engageable over a shoulder 19 of the other member, whereby the two parts of the hanger, during the coupling operation, are in effect a unitary member.

The central conduit 20 of the head extends rearwardly through the support in which it has universal oscillatory movement through a ball 21, limited, however, by the flaring openings 22 and 23 against the walls of which the conduit 20 may impinge. A collar 24 is connected to the ball 21, by means of the threaded hub 24^a, and hence is movable with the movable support relatively to the stationary member 14, but having also an oscillatory movement relative to the hanger by reason of its connection with the conduit 20 which is slidably mounted therein.

A main tension spring 25 is employed, as usual, to support the coupling head in horizontal position and to secure the proper degree of tension between the mating heads when coupled. Said spring is anchored at one end to the head at 26 and at its other end, as at 25^a, to a plate or shiftable abutment 27, which surrounds the conduit 20 adjacent the collar 24. The forward movement of the coupling head under the expansive force of the spring is limited by means of a spider or plate 28 connected to the conduit and adapted to bear normally in the uncoupled position against the rear face of the support, whereby through the spring the axis of the coupling head is maintained in proper coupling position. When the spring is put under compression during the coupling operation the force of the compression is

borne by the hanger through the abutment 27, the collar 24, the member 21, and the trigger 16, the conduit 20 sliding rearwardly with respect to the hanger.

Each abutment 27 is provided with one or more dogs 29, each pivoted in an extension 30, the extensions being arranged preferably diagonally opposite each other so as to cause the dogs to engage the guides 13 of the opposing head. This engagement may be accomplished in any suitable manner, but as indicated each dog is arranged to project through a hole 13^a of the adjacent guide and snap outwardly over a shoulder 13^b by virtue of a contractile spring 31. An anti-friction roller 13^c may be used if desired on said shoulder. The dogs being pivoted at 32 to the plates 27 of both heads, and interlocking with the guides 13, the two heads, the two abutments, the interposed springs 25, and the dogs become practically a unitary rigid structure when coupled, the dogs maintaining a constant degree of pressure on the conduit joints, and being engaged with the respective guides at points comparatively far from the faces of the heads will effect a rigid connection which will not open on a curve or under any other normal operative conditions.

In order to free the support 15 and so relieve the hanger member 14 from the tension of the spring 25 and to leave the coupled heads in practically a floating condition with respect to the draw bars, any suitable means may be resorted to. As shown the spider 28 is provided with an extension 28^a through which the free end of the trigger 16 extends. Said end of the trigger is deflected, forming a cam 16^a adapted to be engaged by the shoulder 28^b on the spider when the head is engaged by a companion head and the conduit 20 and spider are forced rearwardly. The parts are so proportioned and related as to provide that in order for the cars to be coupled at the draw bars the spider must be forced rearwardly sufficiently far to lift the trigger into the position shown in Fig. 7, at which time the spring 25 will be at its maximum compression and the dogs 29 will project through the holes 13^a an abnormal distance momentarily. After the support 15 is freed the force of the spring 25 will give it and the shiftable abutment 27 an impulse rearwardly toward the position indicated in Fig. 8, the rearward movement of the abutment 27 being limited by the dogs 29 which will then engage the shoulders 13^b. In this position the support 15 and collar 24 will play loosely in the rear of the abutment 27 and will hold the trigger 16 out of engagement with the shoulder 19. The aforesaid floating movement of the coupled heads will always exceed the lost motion at the draw bars 10.

When the cars are being uncoupled, each head 12 will be held momentarily by the dogs of the opposing head while the draw bar 10 and attached member 14 are moving rearwardly with respect to the support 15. The collar 24 has extensions 24^b through which the rear ends of the dogs extend. Said rear ends are deflected forming cams 29^a which, coöperating with the shoulders 24^c, limit the space between the abutment 27 and said collar and hence prevent the support 15 from following the member 14 rearwardly until the shoulder 14^a will have been engaged by the support, at which time the trigger 16 will drop into locking position. Continued draft upon the dogs will cause the shoulders 24^c, through the cams 29^a, to rotate the dogs against the tension of the springs 31 and out of engagement with the shoulders 13^b of the guides, thus uncoupling the heads.

In the modification shown in Figs. 9 and 10 provision is made to relieve the dogs 29 from the pressure of the spring 25 so that the several sets of dogs may be released from the respective opposite guides 13. To accomplish this I mount upon the conduit 20′ a quill or sleeve 33, the same being internally threaded to said conduit and provided exteriorly with a series of grooves 33′ whereby the sleeve may be rotated by means of a spanner S and thereby caused to push the abutment 27, carrying the dogs 29, toward the opposite head. The head and conduit being stationary, such movement of the abutment will relieve the pressure between the dogs and the guides interlocking therewith so that upon movement of the support 15 in the opposite direction by any suitable means, as by hand, the dogs will be thrown to the position indicated in Fig. 10 by operation of the collar 24′ upon the rear ends of the dogs in the manner above indicated. The operation of the spider 28′ and also that of the other associated parts are the same in this form of the invention as was previously described. The stationary member 14′ of the bracket is provided with a pin 34, which in its normal position shown in Fig. 9 will prevent any excess outward movement of the abutment 27, but which may be lifted as in Fig. 10 to permit the aforesaid removal of the mechanism. In practice, should it be desired to remove either head for any purpose and replace it without disturbing the coupling of the cars at the draw bars, the trainman will first manipulate the dogs on the opposite head and then carry forward the operation just described with respect to the head to be removed.

Having thus described a preferred embodiment of the invention but intending not to be limited to the specific mechanism illustrated, what I claim is:

1. In an automatic train pipe coupler,

a head for connection with a counterpart head, means operating to place the head under pressure, and automatically shifting mechanism operating to support the coupled heads, said mechanism being free from the resistance of said means under all conditions of service when the heads are coupled.

2. In an automatic train pipe coupler, a head for connection with a counterpart head, a bracket, a spring for placing the head under pressure, and abutment mechanism therefor operating to free the bracket from the pressure of the spring during compression of the latter upon coupling engagement of the heads.

3. In an automatic train pipe coupler, the combination of a coupling head adapted to make connection with a counterpart head, a hanger comprising relatively stationary and movable members, a spring operating between the head and the movable hanger member, and means whereby said movable member is held stationary during the first portion of the coupling operation, and subsequently released to relieve the hanger from all pressure of the spring during all conditions of service.

4. In an automatic train pipe coupler, the combination of a hanger comprising relatively stationary and movable members, mechanism adapted to lock said members together, a head, means associated with the head and operating to release said mechanism when the heads are being coupled, and means to restore the movable member to its normal stationary position.

5. In an automatic train pipe coupler, a head for connection with a counterpart head, a spring for extending the head, an abutment mechanism for said spring, and means for removing a coupled head without first uncoupling the cars, comprising means for shifting said abutment mechanism longitudinally of the car.

6. In an automatic train pipe coupler, a head for connection with a counterpart head, means for placing the head under pressure, an abutment mechanism for said pressure means, and means for removing a coupled head without first uncoupling the cars, comprising means for shifting said abutment mechanism longitudinally of the car.

7. In an automatic train pipe coupler, a head for connection with a counterpart head, and means for placing the head under pressure, an abutment for said means, and mechanism for moving the abutment toward the head and longitudinally of the car to permit the ready removal of a coupled head from the car.

8. In an automatic train pipe coupler, a head for connection with a counterpart head, means for placing the head under pressure, an appliance for locking said head to the counterpart head, and means for removing a coupled head without first uncoupling the cars, including mechanism for putting said pressure means under greater tension and automatically disengaging said locking appliance from the counterpart head.

9. In an automatic train pipe coupler, a head, means for locking said head to a counterpart head, a shiftable support for said head, and means for locking said support against shifting in the uncoupled position of said head.

10. In an automatic train pipe coupler, a head, means for locking said head to a counterpart head, a shiftable support for said head, means for locking said support against shifting in the uncoupled position of said head, and means for automatically releasing said shiftable support upon shifting of said head to coupled position.

11 In an automatic train pipe coupler, a head, means for locking said head to a counterpart head, a shiftable support for said head, and a latch device for lockingly engaging said shiftable support in the uncoupled position of said head.

12. In an automatic train pipe coupler, a head, means for locking said head to a counterpart head, a shiftable support for said head, a latch device for lockingly engaging said shiftable support in the uncoupled position of said head, and means for automatically releasing said latch device upon shifting of said head to coupled position.

13. In an automatic train pipe coupler, a head, means for locking said head to a counterpart head, a shiftable support for said head operating to disengage said locking means during separation of the cars, and means for locking said support against shifting in the uncoupled position of said head.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

JOS. V. ROBINSON.

Witnesses:
GEO. L. BEELER,
H. C. ROBB.