

F. C. DOANE & F. E. CEEDER.  
 AUTOMATIC PIPE COUPLING.  
 APPLICATION FILED APR. 24, 1909.

940,678.

Patented Nov. 23, 1909.  
 3 SHEETS—SHEET 1.

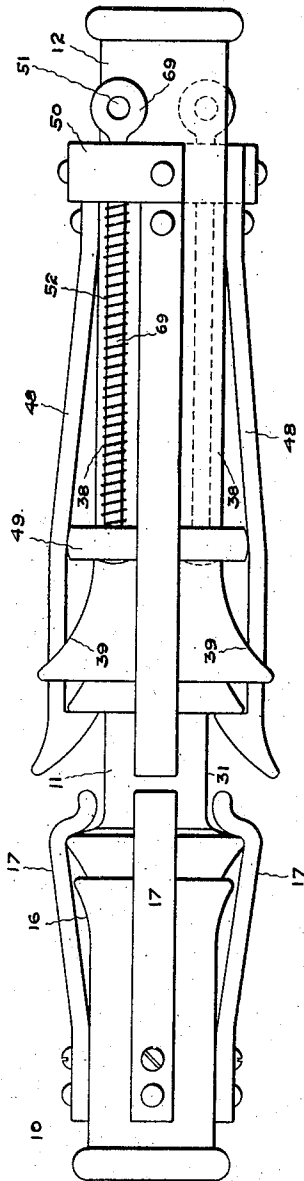


FIG. 1.

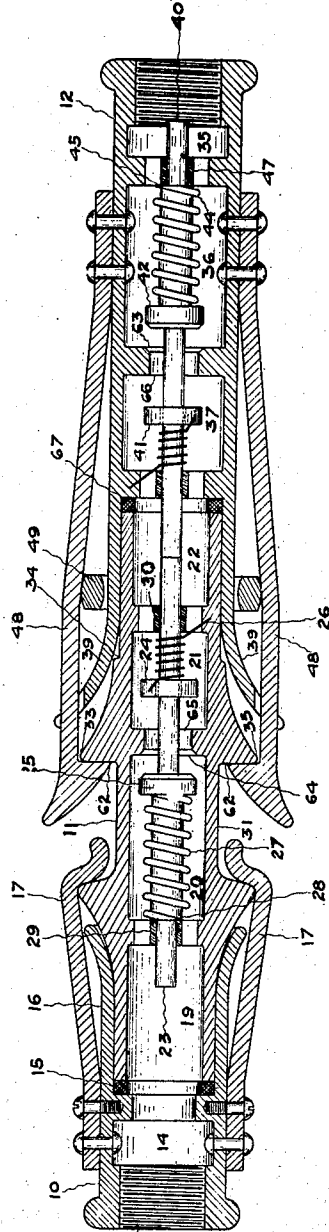


FIG. 2.

WITNESSES

Mary Sholderer  
 W. R. Sampson

Frank C. Doane  
 Fred C. Ceeder

INVENTORS

BY

L. L. Westfall

ATTORNEY

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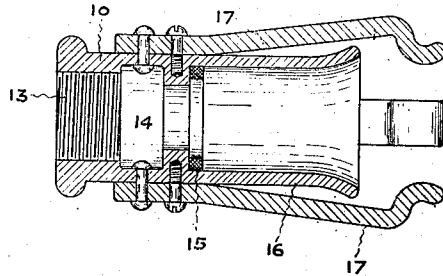


FIG. 3.

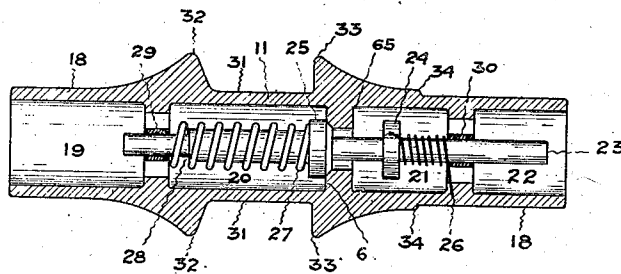


FIG. 4.

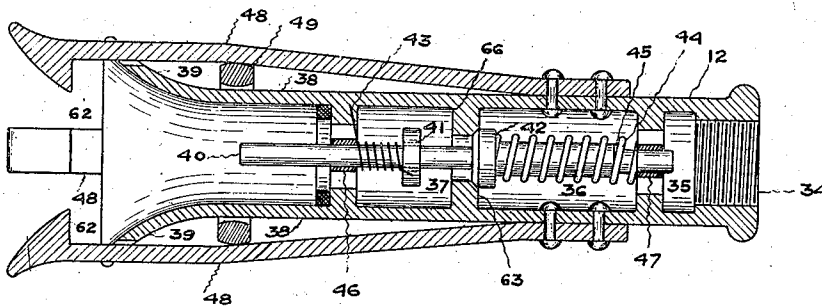


FIG. 5.

WITNESSES  
 Mary Shollerer

W. R. Sampson

Frank C. Doane  
 Fred E. Ceeder INVENTORS

BY

L. L. Westfall ATTORNEY

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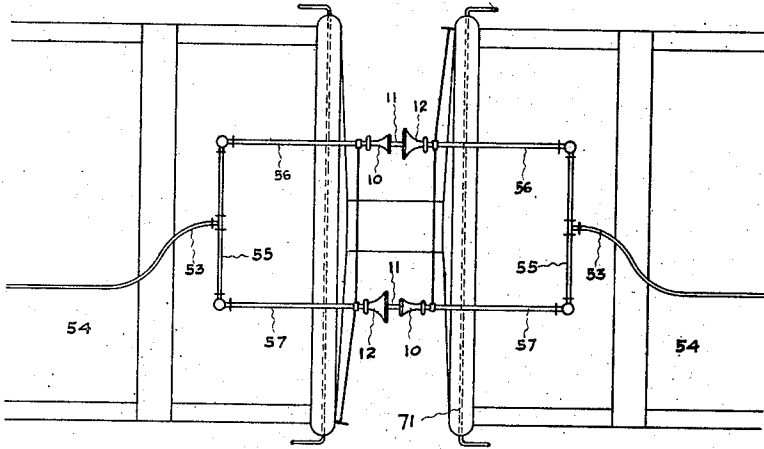


FIG. 6.

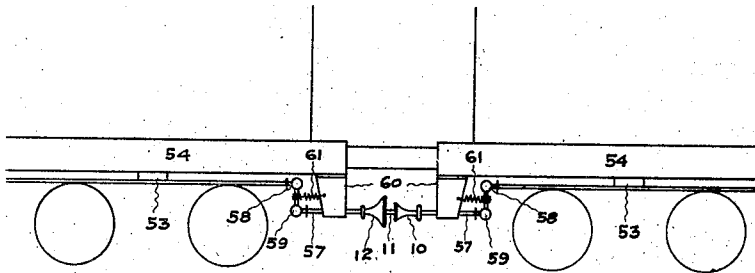


FIG. 7.

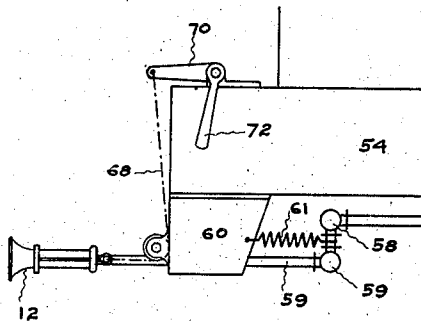


FIG. 8. Frank C. Doane, INVENTORS  
 Fred E. Ceeder  
 BY  
 L. L. Westfall ATTORNEY

WITNESSES  
 Mary Sholderer  
 W. R. Sampson

# UNITED STATES PATENT OFFICE.

FRANK C. DOANE AND FRED E. CEEDER, OF SPOKANE, WASHINGTON, ASSIGNORS OF  
ONE-THIRD TO WILLIAM A. MacKENZIE, OF SPOKANE, WASHINGTON.

## AUTOMATIC PIPE-COUPLING.

940,678.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed April 24, 1909. Serial No. 491,965.

*To all whom it may concern:*

Be it known that we, FRANK C. DOANE and FRED E. CEEDER, citizens of the United States, residing at Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Automatic Pipe-Couplings, of which the following is a specification.

This invention relates to certain new and useful improvements in automatic pipe couplings, and is particularly designed for coupling the air pipes arranged to carry compressed air from one car to another in a railway train for the purpose of operating brakes and the like.

Particular objects of the invention are to provide a coupling that will enable the operator to uncouple the pipe by the operation of the same lever with which he draws the pin in uncoupling the cars and to avoid the necessity of at any time stepping in between the cars to either couple or uncouple pipes; to provide a coupling that will automatically separate in case the train should break in two and also automatically set the brakes in such a case upon the rest of the train.

Other and further special objects will be disclosed in the specification hereinafter and by the drawings accompanying the same, in which—

Figure 1, is a side elevation of an assembly of the parts going to make up the coupling in the position they would be when serving to couple together the pipes on two cars, Fig. 2, is a longitudinal sectional view of the same as pertains to the casing and outer parts and a side elevation of the inner parts thereof, Fig. 3, is a longitudinal sectional view of one end of the coupling as pertains to the casing and outer parts and the side elevation as pertains to the inner portion thereof, Fig. 4, is a like view of the central part thereof, Fig. 5, is a like view of the other end thereof, Fig. 6, is a plan view of the application of the device when in use and serving as a coupling for the pipes upon two cars, Fig. 7, is a side elevation of the same, and Fig. 8, is a side elevation of one end of the coupling attached to the pipe on one car and in a position to be connected up with the other end thereof when the two cars are brought together.

The coupling is divided into three pri-

mary parts 10, 11 and 12. The part 10 is adapted to be connected with the pipe on one of the cars by means of the threaded aperture 13 adapted to engage a threaded end on the pipe of the car. The part 10 is also provided with an air chamber 14, a gasket 15, a bell-shape casing 16 and has bolted or riveted thereto steel clutches 17.

Part 11 is provided with a casing 18, air chambers 19, 20, 21 and 22, a valve stem 23 carrying the valves 24 and 25, the former 24 being loose upon the stem 23 and connected with the coil spring 26 which encircles the valve stem 23, while the valve 25 is rigid upon the stem 23 and rests against the coil spring 27, also encircling the valve stem 23. The valve stem 23 is provided with a shoulder 28 and is held in a horizontal position by the circular guides 29 and 30. The casing 18 is increased to greater diameter as you approach intermediately of the same at both ends, leaving a channel 31 at the center thereof with a rounding wall at one side thereof as at 32 and a perpendicular wall at the other side thereof as at 33. A shoulder 34 is also provided on the surface of the casing 18, the purpose of which will be hereinafter explained.

The part 12 is adapted to be connected to the pipe of a car by means of the threaded aperture 34, adapted to engage a thread upon the end of the pipe. Part 12 is provided with air chambers 35, 36 and 37 and with a casing 38, terminating as at 39 in a bell-shape. Part 12 is also provided with a valve stem 40 carrying valves 41 and 42, the former of which is loose upon the stem 40 and attached to the coil spring 43 encircling the valve stem 40, while the latter is rigid upon the valve stem 40 and rests against the coil spring 44. The valve stem is provided with a shoulder 45 and is held in a horizontal position by means of the circular guides 46 and 47. The casing 38 has riveted thereto steel springs 48 which inclose a ring 49 encircling the casing 38. Outside of the casing 38 and longitudinally arranged therewith, secured to the ring 49 at one end and passing through the bearing 50 and terminating with a circular end provided in an aperture 51 therein is a rod 69 which is encircled by a coil spring 52 between the ring 49 and the bearing 50.

We have shown the train pipe 53 bent to

the center of the car 54 and connected at the center of a pipe 55 arranged transversely of the car 54 with pipes 56 and 57 connected at the ends thereof and reaching out beyond the end of the car 54. To one of these pipes we have attached the part 10 and to the other the part 12, while on the opposite car we have reserved the positions of the parts 10 and 12, so that there can be no possible mistake in not having both the parts 10 and 12 where each coupling is to be made. We prefer to have the part 11 connected up with the part 10 when the cars are uncoupled for the reason that we have provided part 12 with a bell shaped opening 39 making it easier and more certain for the connecting parts to seek their right position when brought together by the approach of the cars to each other. The transverse pipe 55 and the extension pipes 56 and 57 should be connected by ball joints 58 and 59 to provide for proper play when trains are going around a curve and on other occasions. We have shown spring carrier plates 60 attached to the bottom of the cars 54 adapted to hold the pipes in proper position and coil springs 61 connected to the same and also to the angle ball joints 59.

In the practical use of the coupling, the parts 10 and 11 would be connected to the pipe extension 57 at the end of one car and part 12 would be connected to the pipe extension 57 at the end of the opposite car. When the cars are brought together the end of part 11 will be guided into the bell shaped opening 39 of the casing 38, the steel clutching parts 48 will spread until the clutching points 62 reach the perpendicular sides of the channel 31 in part 11 when the same will spring inward and clutch the part 11 at that point and which is the position of the parts when a complete coupling has been effected. The ends of the valve stems 23 and 40 will have come together prior to the points 62 reaching the clutching point and will have been forced back, thereby opening the valves in the connecting parts and connecting up the air from the car previously connected with the train to the one being connected with the train. For instance the valve 42 being seated at 63 is opened and the valve 25 being seated at 64 is opened, giving a free passage from the pipe on the car connected with the train through the chambers 35, 36, 37, 22, 21, 20, 19 and 14 thereby reaching the pipe of the car being connected up. Calling attention to valves 24 and 41 in this connection, valve 24 is capable of being seated at 65 and valve 41 is capable of being seated at 66 and as has heretofore been stated, these two valves are loose upon the stems. We have termed these "graduating valves" and they are for the purpose of preventing a complete opening from one connecting part to another in-

stantaneously when the cars are connected up and are calculated to provide a means for allowing the air to pass gradually until the pressure of air in the pipes of the connecting car is equal to the pressure in the pipes of the train. The practical working of these valves would be that the force of the air coming into chamber 36 and rushing toward chamber 37 would unseat the valve 41 from its position at 66, the air then passing through chambers 37 and 22 and into 21 would seat the valve 24 at 65 thereby closing the passage excepting such opening as would be left between the valve 24 and the stem 23 by reason of the valve 24 being loose upon the stem 23, thus causing a slow seepage of the air between the valve 24 and the stem 23 until the force of the air in the pipe of the connecting car is equal to the force in the pipes of the train when the coil spring 26 will unseat the valve 24 from its position 65 allowing a free passage then of the air through all of the chambers and connecting parts. In order to avoid a possibility of either one of the valves 42 or 25 not opening when the parts are connected, we have provided shoulders 45 and 28 upon the valve stems 40 and 23 respectively adapted to engage the circular guides 47 and 29 after the springs 44 and 27 upon the valve stems 40 and 23 respectively have contracted a certain amount. This provision is made in order that the contact of the valve stems 40 and 23 will force the other spring to contract sufficiently to unseat the opposite valve. The shoulder 34 upon the casing 18 is adapted to come in contact with the inner surface of the bell shaped opening 39 in the connecting up of the coupling at a point where there is a proper pressure upon the gasket 67 and to relieve it from any extraordinary pressure. In case of an accident where a train is broken in two, the coupling will automatically separate where the parts 10 and 11 are joined by the steel clutches 17 slipping over the rounding wall 32 of the channel 31 leaving the valves all open in the remainder of the coupling thereby permitting the brakes to be set upon the cars remaining connected with the engine and assisting in the stopping of the train. We have shown a means of uncoupling the apparatus by attaching a cable 68 to the orifice 51 of the rod 69 connected with the ring 49 the cable also being connected to a lever 70 secured to the rod 71 and adapted to be rotated by a hand lever 72 at one side of the car 54. The turning of this lever will draw the ring 49 inward, throw the steel clutches 48 outward and release the part 11 from the part 12, and contract the coil spring 52. After the parts are disconnected, the coil spring 52 will then have the force to return the ring 49 to its position shown in Figs. 1 and 2.

Having thus described our invention, what we claim as new and useful and desire to secure by Letters Patent, is:

1. In a pipe coupling, composed of three sections, one each adapted to be secured to the ends of the pipes to be coupled together and a central section adapted to unite the other two, the said central section being circular in form and gradually increased in diameter from both ends as it approaches the center, with, however, a channel at the center portion of approximately the same diameter as the outer ends of the section, with a rounded wall at one side and perpendicular wall at the other the ends of the said central section adapted to enter bell-shaped openings in the ends of the other two sections and be retained therein by spring clutches secured to the end sections, with shoulders adapted to engage the rounded and perpendicular walls of the channel at the center of the central section, substantially as described.

2. In a pipe coupling, composed of three sections, one section provided with a chamber and a bell-shaped opening, one provided with a chamber at each end and two centrally located chambers, a valve stem extending longitudinally through the chambers carrying one valve loose upon the same and one rigidly secured thereto, the valve loose upon the stem located in one of the centrally disposed chambers, secured to a coil spring encircling the valve stem and capable of being seated at one end of the chamber and partially blocking the entrance thereto, the valve rigidly secured to the stem located in the other centrally disposed chamber against the end of a coil spring encircling the valve stem and capable of being seated at one end of the chamber and blocking the entrance thereto, and one provided with a chamber at one end and a bell-shaped opening at the other, two chambers centrally located therein, a valve stem extending longitudinally through the chambers carrying one valve loose thereon occupying one of the centrally disposed chambers secured to the end of a coil spring encircling the stem and capable of being seated at one end of the chamber and partially blocking the entrance thereto, the valve rigidly secured to the stem located in

the other centrally disposed chamber against the end of a coil spring encircling the valve stem and capable of being seated at one end of the chamber and blocking the entrance thereto, substantially as described.

3. In a pipe coupling, composed of three sections, one section provided with a chamber and a bell-shaped opening, one provided with a chamber at each end and two centrally located chambers, a valve stem extending longitudinally through the chambers carrying one valve loose upon the same and one rigidly secured thereto, the valve loose upon the stem located in one of the centrally disposed chambers, secured to a coil spring encircling the valve stem and capable of being seated at one end of the chamber and partially blocking the entrance thereto, the valve rigidly secured to the stem located in the other centrally disposed chamber against the end of a coil spring encircling the valve stem and capable of being seated at one end of the chamber and blocking the entrance thereto, and one provided with a chamber at one end and a bell-shaped opening at the other, two chambers centrally located therein, a valve stem extending longitudinally through the chambers carrying one valve loose thereon occupying one of the centrally disposed chambers secured to the end of a coil spring encircling the stem and capable of being seated at one end of the chamber and partially blocking the entrance thereto, the valve rigidly secured to the stem located in the other centrally disposed chamber against the end of a coil spring encircling the valve stem and capable of being seated at one end of the chamber and blocking the entrance thereto, each of the valve stems held to a horizontal position by guides encircling the same between the chambers, and each valve stem provided with a shoulder near one end thereof capable of being seated against one of the circular guides, substantially as described.

In testimony whereof we affix our signatures, in presence of two witnesses.

FRANK C. DOANE.  
FRED E. CEDDER.

Witnesses:

W. R. SAMPSON,  
MARY SHOLDERER.