E. B. WITTE.

AIR, STEAM, AND SIGNAL COUPLING.

APPLICATION FILED JULY 10, 1907. RENEWED NOV. 11, 1908.

906,981.

Patented Dec. 15, 1908

2 SHEETS—SHEET 1.

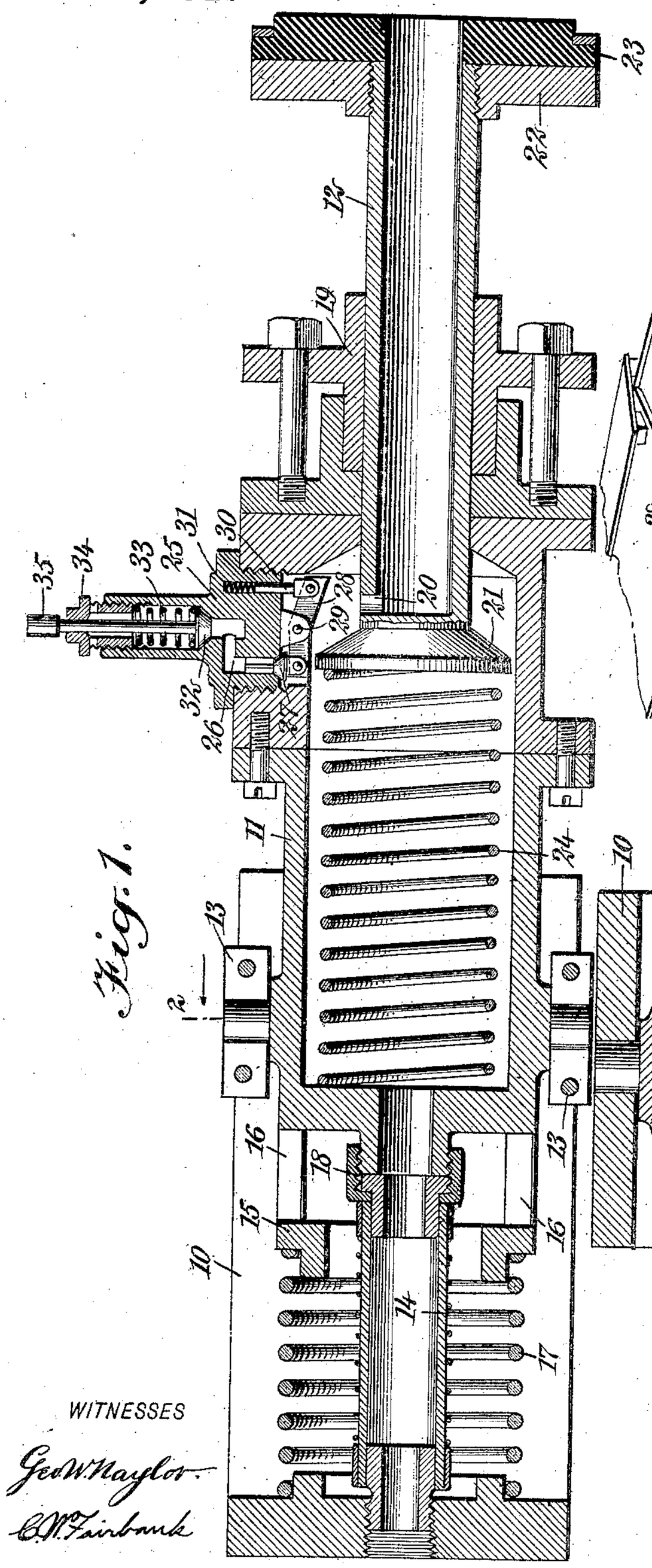

Fig. 1.

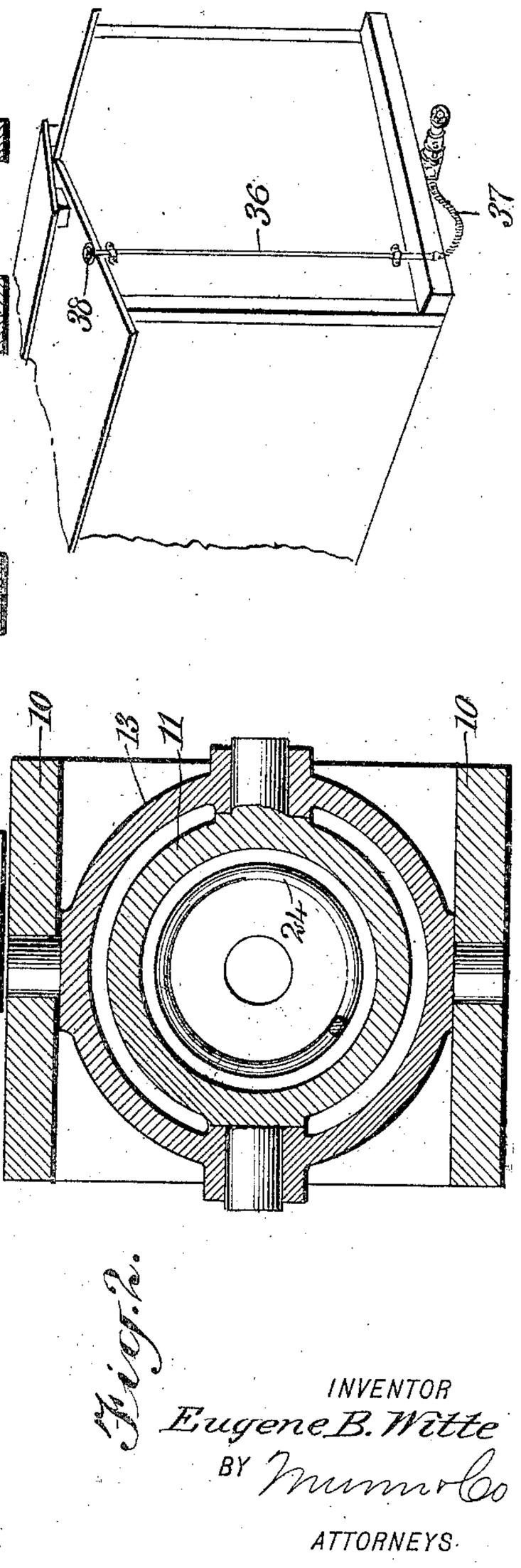

Fig. 2.

WITNESSES

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Fig. 5.

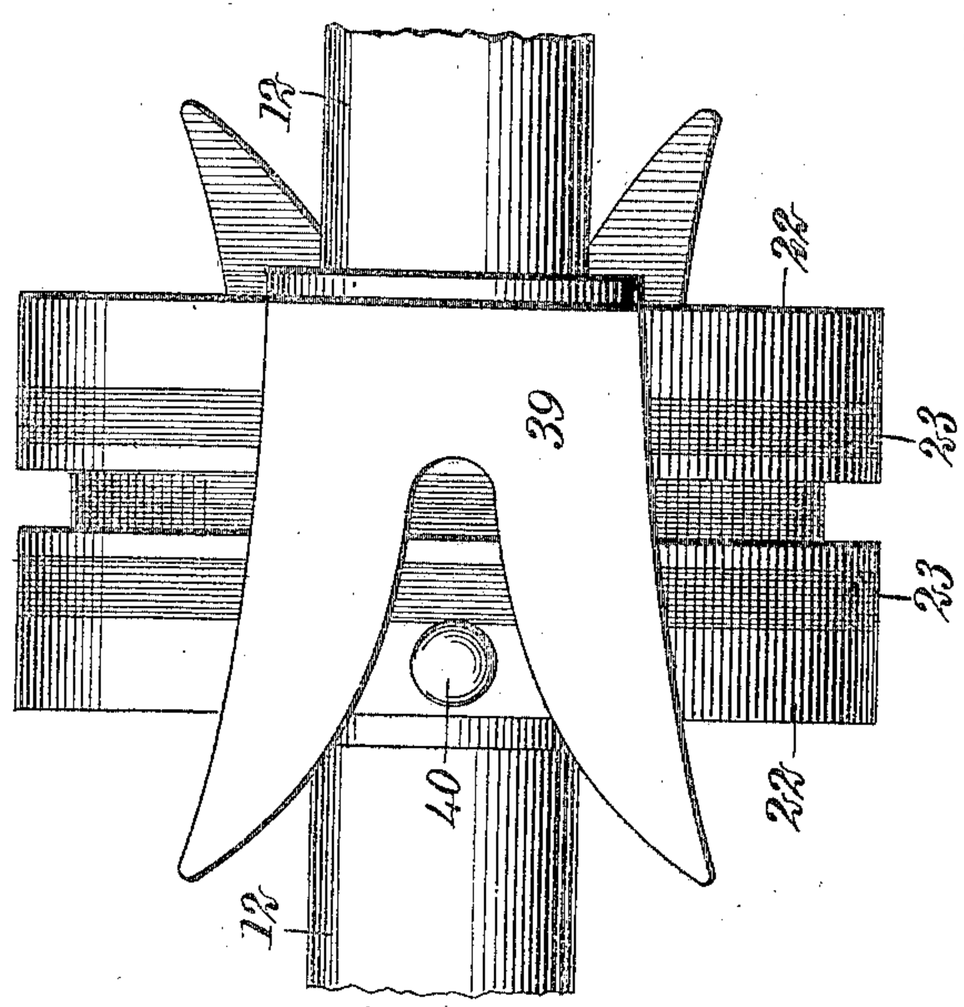
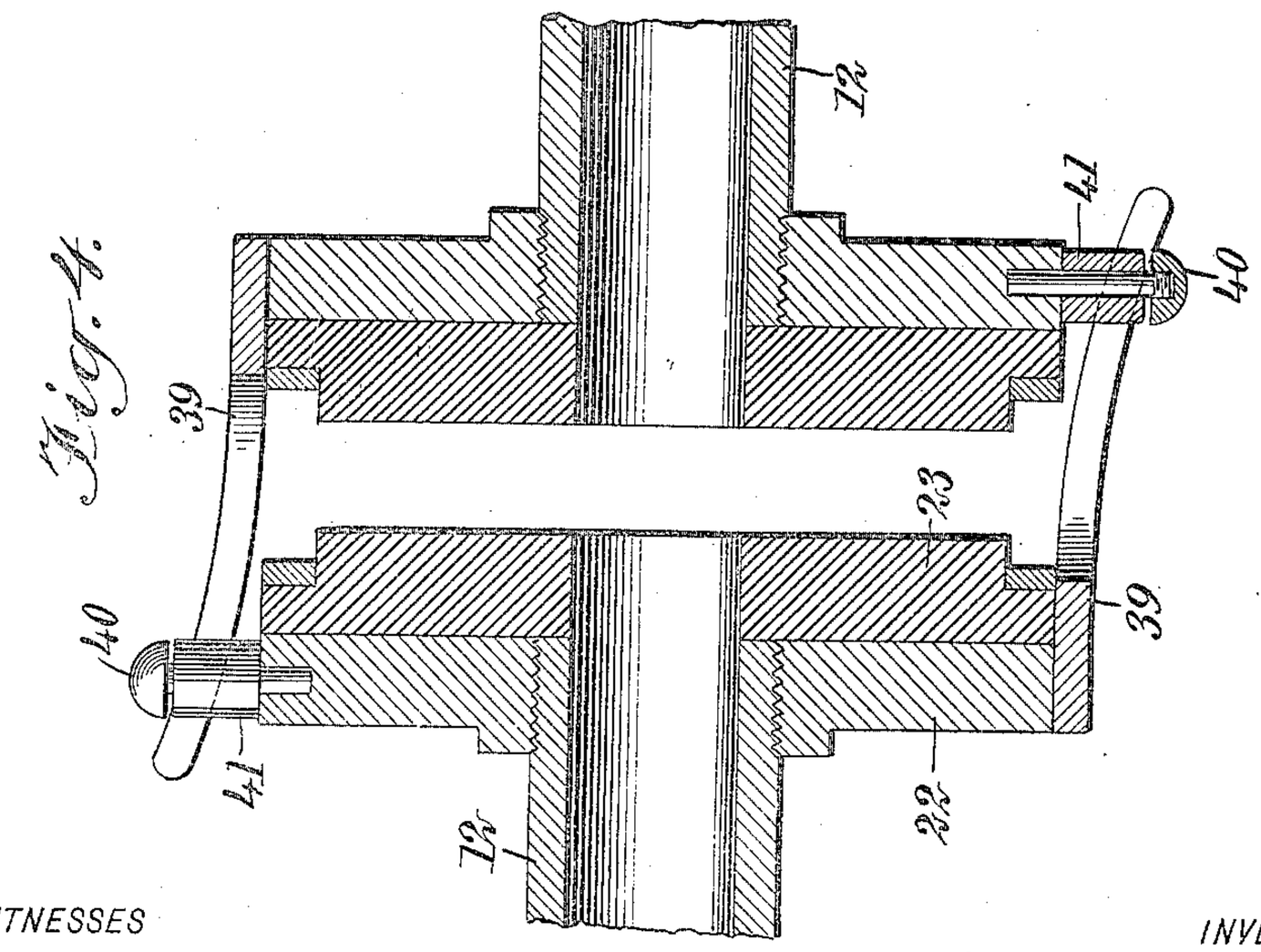


Fig. 4.



WITNESSES

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AIR, STEAM, AND SIGNAL COUPLING.

No. 906,981. Specification of Letters Patent. Patented Dec. 15, 1908.

Application filed July 10, 1907, Serial No. 383,126. Renewed November 11, 1908. Serial No. 462,157.

To all whom it may concern:

Be it known that I, EUGENE B. WITTE, a citizen of the United States, and a resident of Trenton, in the county of Mercer and State of New Jersey, have invented a new and Improved Air, Steam, and Signal Coupler, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in couplers for use in connection with air brake systems, train signals and steam heating systems, and involves means whereby when a car is detached from the train, the valves of the car will close to retain sufficient air in the cylinder and pipe line of the car to hold the brakes in release position and permit the car to move by its own momentum to the desired point. Mechanism is provided whereby all excess of air over that positively required to hold the brakes is permitted to escape, and mechanism is also provided whereby the remainder of the air may be permitted to escape to set the brakes, said mechanism being operable from the upper or any other desirable portion of the car and adapted to be manipulated by the brakeman or other employee.

The device also embodies certain improvements in the means for bringing couplers on adjacent cars into alinement, means for supporting the coupler, means for normally holding it horizontally, and means for closing the valve of the train line when the cars are uncoupled.

The invention consists in certain features of construction and combinations of parts, all of which will be fully set forth hereinafter and particularly pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which—

Figure 1 is a longitudinal section through a coupler constructed in accordance with my invention; Fig. 2 is a transverse section in a plane indicated by the line 2 of Fig. 1; Fig. 3 is a perspective view of a car showing means for operating the air escape valve from the roof of the car; Fig. 4 is a longitudinal section showing means for bringing the couplers of adjacent cars into alinement and holding them there; and Fig. 5 is a top plan view of the parts shown in Fig. 4.

My improved coupler involves certain improvements over that disclosed and claimed in Patent No. 824,034, granted to myself and O. E. Leib on June 19, 1906, and may be used in connection with steam and air signal systems referred to in said patent.

In the present construction I employ a main yoke 10 carried by the car adjacent each end thereof and having a cylinder 11 connected thereto by a universal joint. The cylinder is provided with a tube 12 telescoping therewith, and the two tubes of adjacent cars are adapted to be rigidly connected together and held in alinement, the universal joints of the two cylinders permitting of a free movement. The universal joint illustrated involves a collar 13 pivotally mounted between the opposite arms of the yoke and surrounding the cylinder 11, said cylinder being pivotally connected to the collar. All of the pivots lie in the same plane, but two of them extend in a direction at right angles to the other two. The train line of the pipe is connected to the yoke 10 intermediate the yoke arms, and from the point of attachment to the rear end of the cylinder there is provided a flexible conduit 14 for delivering the air from the train line to the cylinder 11. The flexibility of the pipe permits of a free movement of the cylinder 11, although means are provided for normally holding the cylinder in alinement with the conduit. The rear end of the cylinder is provided with a collar 15 spaced therefrom by arms 16, and intermediate the collar and the rear of the yoke, I provide a strong coil spring 17. This spring tends to force the cylinder toward the ends of the yoke arms, and tends to resist the turning of the cylinder in either a vertical or a horizontal direction. The flexible conduit 14 is connected to the rear of the cylinder by a suitable coupling 18, which coupling is preferably disposed between the collar and the end of the cylinder, whereby access may be readily had between the arms 16. It is evident that other means may be employed for holding the cylinder in its desired position, as, for instance, a plurality of springs may be used engaging with the end of the cylinder from different sides, whereby the cylinder is resiliently held in its central position. Through the opposite or outer end of the cylinder extends the tube 12, as in the construction illustrated in the patent above referred to, and a suitable packing ring 19 serves to form a tight joint between the end of the cylinder and the said tube. Adjacent the inner end of the tube, there is provided a

port 20, whereby air may freely pass from the interior of the tube to the cylinder, and the inner end of the tube is provided with a valve plate 21 seating upon the inner end of the cylinder. The outer end of the tube is provided with a disk 22 having a facing 23 of soft rubber or the like, and the parts are so proportioned that the facing 23 on the tube of one car engages with the corresponding facing on the tube of the adjacent car, to form a tight seal and to force the valve plates 21 away from their seats and uncover the ports 20. For normally holding the facings firmly together and for automatically closing the valve when the cars are uncoupled, I provide a coil spring 24 within the cylinder and in engagement with the valve plate 21. In the construction previously employed, the spring for accomplishing this purpose was mounted upon the outer surface of the tube, but by placing it upon the inside of the cylinder the device is rendered far more compact, and the spring is protected and prevented from injury and concealed from view.

In breaking up and reforming trains, it is often desirable that the brakes of each individual car be prevented from being applied as the cars are uncoupled from the remainder of the train, and as the car moves by its own momentum onto the desired switch, it is desired that means be provided for quickly applying the brakes and stopping the car. For accomplishing this purpose, I provide the casing 25 having a conduit 26 therethrough, said conduit being controlled by two separate and independent valves. One of these valves, 27, is mounted on the inner end of the conduit and serves to positively prevent the escape of any air from the cylinder while the cars are coupled together. The valve at its inner end is pivotally connected to a lever 28, which lever is fulcrumed to a suitable lug 29 on the inner end of the casing 25. The opposite end of the lever is pivotally connected to a plunger 30 fitting within a recess in said casing and normally forced downward by a suitable spring 31. The lever 28 is of such a form and is so disposed that the portion thereof intermediate the fulcrum and the pivotal connection to the valve 27 lies substantially in alinement with the wall of the cylinder and out of engagement with the valve plate 21, but the remainder of the lever, namely, the portion intermediate the fulcrum and the pivotal connection to the plunger 30 extends into the cylinder and is adapted to be operated by the engagement of the valve plate 21 therewith.

Adjacent the outer end of the conduit 26, there is mounted a second valve 32 which opens outwardly and is normally held in its seat by a coil spring 33. The spring engages at its outer end with a cap 34 screw-threaded to the casing, whereby the tension of the spring may be varied, and having passages through it at the outer end, whereby the air passing the valve may readily escape. Rigid with the valve 32 is a suitable valve stem 35 extending out through the cap 34, and means are connected to this valve stem, whereby a brakeman upon the roof of the car may open the valve 32 at any time desired. Any suitable mechanism may be provided for accomplishing this result, but, as illustrated, I have provided a rod 36 having flexible connection 37 to the valve stem and having an operating handle 38 at its upper end and adjacent the roof of the car. The tension of the spring 33 is such that the valve 32 is positively held closed to retain sufficient air in the cylinder and pipe line to prevent the brakes from automatically applying, but any excess of air over this minimum amount is permitted to escape by the automatic opening of the valve against the pressure of said spring 33.

In the operation of this feature of my improved device, the parts normally remain in the position indicated in Fig. 1 while the cars are coupled together, but as soon as the car carrying the device illustrated is uncoupled from the train, the spring 24 forces the valve plate 21 to its seat and closes the port 20 to retain the air. The valve plate 21 in its movement engages with the end of the lever 28 and rocks the lever to positively open the valve 27 and permit the pressure within the cylinder to be communicated to the under side of the valve 32. Any excess of air within the system over that required for holding the brakes out of engagement with the wheels is permitted to escape past the valve, but the valve insures the retention of sufficient air to prevent the brakes from setting. The car is then moved either by its own momentum, or by any other suitable force, until it reaches the desired position, and then the brakeman riding on the car operates the handle 38 to pull out the valve stem 35 and open the valve 32. This permits the air pressure within the cylinder 11 and train pipe to decrease to a sufficient extent to allow the brakes to set and stop the car.

To insure the bringing of the couplers into perfect alinement irrespective of slight variations in the height of the cars, I preferably provide the means illustrated in Figs. 4 and 5. On each of the terminal plates 22, at one edge thereof and extending outwardly at substantially right angles therefrom, I provide a plate 39 having a substantially V-shaped recess, whereby two separate prongs are formed and the plate converted into a fork. The plate is preferably curved outwardly as illustrated, whereby as the buffers 23 of the two adjacent couplers are brought together, the plates or forks will guide the tubes 12 into perfect alinement. Directly opposite to each of the plates, I preferably provide a pin 40 having a roller 41 rotatably mounted

thereon. This pin is adapted to coact with the fork of the opposite coupler and enter between the prongs to guide the tube in a plane at right angles to the plane in which the curvature of the plate performs the guiding action. Each of the tubes 12 of the adjacent couplers are rotatable and in bringing the cars together the tubes are supported so that the roller of each coupler enters between the prongs of the plate on the opposite coupler.

The mechanism described is adaptable for use upon either freight cars or passenger cars, but when used upon the latter, the air signal system and the steam heating system may be employed in connection therewith, as illustrated in the patent above referred to.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. An air brake coupler, including a cylinder, a valve in connection therewith for controlling the flow of air to and from the cylinder and adapted to be closed by the detaching of the car carrying said coupler, a valve in communication with said cylinder and opening automatically to permit the escape of the excess of air over and above that required to maintain the brakes in released position, and manually-controlled means for opening said valves to set the brakes.

2. In an air brake system, a coupler, a valve mounted therein and adapted to close and retain air within the train pipe of the car carrying said coupler upon the detaching of the car from the train, a second valve adapted to open automatically and permit the escape of the excess of air in the train pipe of said car over and above that required to maintain the brakes in released position, and manually-controlled means for opening said valves to set the brakes.

3. In an air brake system, a coupler having a valve for controlling the flow of air through said coupler, means for closing said valve upon the detaching of the coupler, a conduit carried by said coupler, a valve for controlling the flow of air through said conduit, and means for positively opening and closing said valve by the closing and opening of the first mentioned valve.

4. In an air brake system, a coupler having a valve for controlling the flow of air through said coupler, means for closing said valve upon the detaching of the coupler, a conduit in communication with said coupler, an inwardly-opening valve for controlling the escape of air through said conduit, and means for positively opening said valve by the detaching of the coupler.

5. In an air brake system, a coupler having a valve for controlling the flow of air through said coupler, means for closing said valve upon the detaching of the coupler, a conduit carried by said coupler, a valve for controlling the escape of air through said conduit, and a lever arm operatively connected to said valve and having a portion thereof lying in the path of movement of the first mentioned valve, whereby the closing of said first mentioned valve opens the other valve.

6. In an air brake system, a coupler having a valve for controlling the flow of air through said coupler, means for closing said valve upon the detaching of the coupler, a conduit carried by said coupler, an inwardly-opening valve for normally preventing the escape of air through said conduit, and a lever arm operatively connected thereto and having a portion thereof lying in the path of movement of the first mentioned valve, whereby the valve is positively opened by the closing of said first mentioned valve.

7. In an air brake system, a coupler having a valve for controlling the flow of air through said coupler, means for closing said valve upon the detaching of the coupler, a conduit carried by said coupler, and an outwardly-opening spring-pressed valve for permitting the escape of the excess of air over and above that required for maintaining the brakes in released position.

8. In an air brake system, a coupler having a valve for controlling the flow of air through said coupler, means for closing said valve upon the detaching of the coupler, a conduit in communication with said coupler, an outwardly-opening spring-pressed valve, and manually-controlled means for opening said valve to set the brakes.

9. In an air brake system, a coupler having a valve for controlling the flow of air through said coupler, means for closing said valve upon the detaching of the coupler, a conduit carried by said coupler, an inwardly-opening valve in said conduit, means for opening said valve upon the closing of the first-mentioned valve, and a second valve in said conduit beyond the first mentioned valve and adapted to be manually opened to set the brakes.

10. In an air brake system, a coupler having a valve for controlling the flow of air through said coupler, means for closing said valve upon the detaching of the coupler, a conduit carried by said coupler, two valves in said conduit, means for opening one of said valves to permit the air to pass to the second valve upon the closing of the first mentioned valve, and means for manually opening said second valve of the conduit to permit the escape of air to set the brakes.

11. An air brake coupler, comprising a cylinder, a valve for controlling the passage of air therethrough, means for closing said valve, and a second valve adapted to be positively opened by the closing of said first mentioned valve for permitting the escape of

air from the cylinder over and above that required to maintain the brakes in released position.

12. In an air brake system, a cylinder, a movable valve therein, a casing connected to said cylinder, a valve in the casing for allowing the escape of air from the cylinder, and a spring for forcing said valve to its seat, said spring being of such strength as to prevent the escape of air to a pressure below that required to maintain the brakes in released position.

13. In an air brake coupler, a yoke, a collar pivotally mounted therein, a cylinder extending through said collar and pivotally supported therein, whereby a universal joint is formed between said yoke and said cylinder, and a flexible tube connected to the end of said cylinder for establishing communication between the cylinder and the train pipe.

14. In a train pipe coupler, a cylinder, a support, a universal joint connecting said cylinder and support, a flexible tube, a coupling connecting the tube to the end of the cylinder, and a coil spring in engagement with the support and with said cylinder independent of the coupling and encircling the tube but out of engagement therewith for protecting the tube and maintaining the cylinder in the normal position.

15. In an air brake coupler, a suitable support, a cylinder pivotally mounted therein, a collar carried by said cylinder, and spaced from the end thereof, a flexible tube extending through said collar and a coupling for connecting said tube to said cylinder and located intermediate the end of the cylinder and the collar.

16. In combination, a coupler including a longitudinally-movable tube, a plate at one end thereof, a buffer upon the face of said plate, an outwardly-curved forked plate carried by said first mentioned plate and extending at substantially right angles to the plane of the buffer, and a roller oppositely disposed to said forked plate and adapted to enter between the forks of the coupler on an adjacent car.

17. In an air brake coupler, a suitable support, a cylinder pivotally mounted therein, a collar carried by said cylinder and spaced from the end thereof, a flexible tube extending through said collar, a coupling for connecting said tube to said cylinder and located intermediate the end of the cylinder and the collar, and a coil spring in engagement with said collar and encircling said tube for maintaining the cylinder in a normal position.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EUGENE B. WITTE.

Witnesses:
JOSEPH L. BODINE,
SCOTT SCAMMELL.