March 10, 1936. G. MILLER 2,033,348

AUTOMATIC AIR COUPLER

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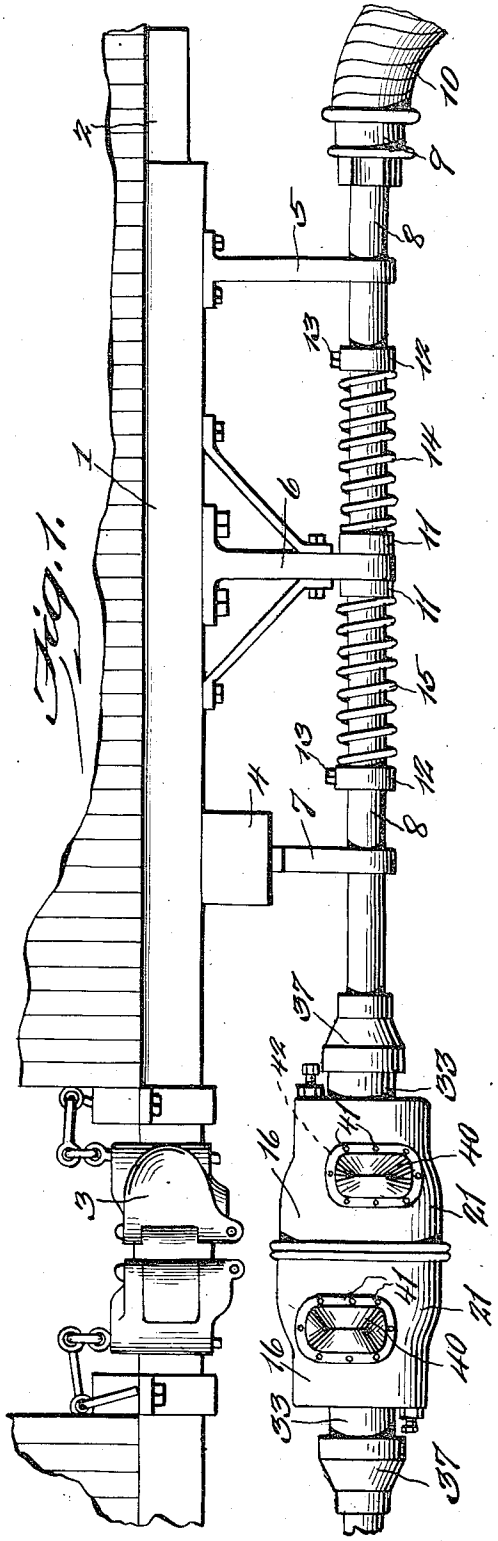


Fig. 1.

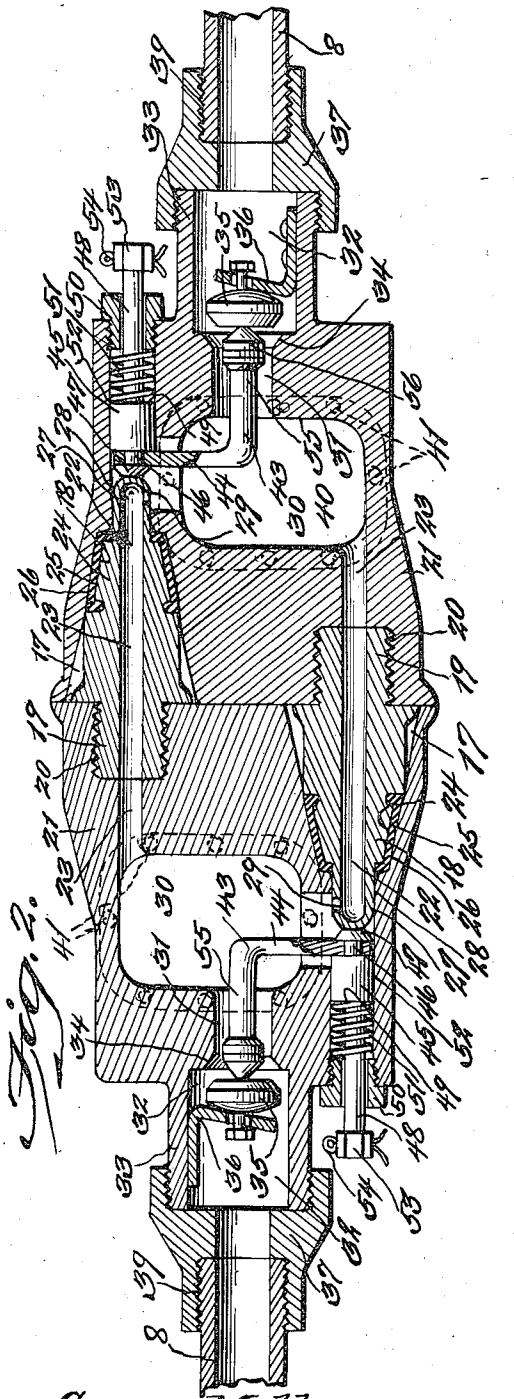


Fig. 2.

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Fig. 3.

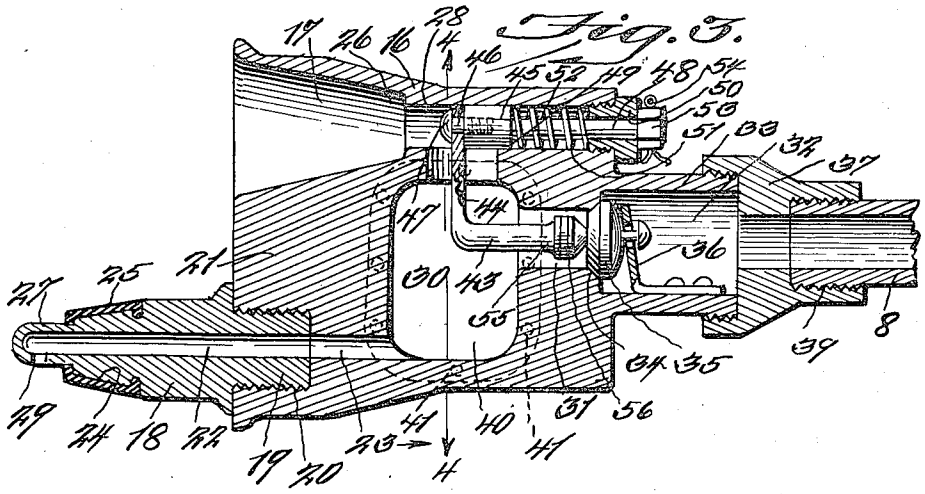
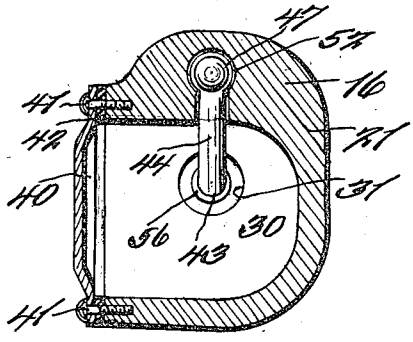


Fig. 4.



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UNITED STATES PATENT OFFICE

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AUTOMATIC AIR COUPLER

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Application January 8, 1934, Serial No. 705,772

1 Claim. (Cl. 284—5)

This invention relates to an improved automatic air coupler for trains, and a purpose of the invention is to provide, in a device of this kind, wherein should the Janney car coupler pull out the air line automatically uncouples and the air is automatically shut off, thus saving the train from being wrecked.

It is another purpose to provide a device, which eliminates the necessity of uncoupling and coupling the air hose and opening and closing angle cocks, by reason of the fact that when the two units of the automatic air coupler unite the air is automatically cut in from one car of the train to another.

Another purpose is to provide an automatic air coupler associated in close position to the standard Janney car coupler, so that when the elements of the car coupler automatically connect, male elements of the respective uniting units of the air coupler automatically enter female elements of the respective units, and through the medium of the male elements contacting with and actuating plungers, suitable check valves of the air coupling units are automatically opened, thereby cutting in the air of the air line.

Still another purpose is to provide an automatic air coupler, the construction and arrangement of the elements of which save considerable time and labor in coupling up a train consisting of a number of cars, also avoiding trainmen and the like stepping in between the cars for connecting the joints between the air line or hose of the cars, and thereby saving many lives and limbs, besides saving considerable expense for the railroads by reducing wrecks to a substantial minimum.

Still another purpose is to provide an automatic air coupler, which practically entirely eliminates wrecks caused by the cars of the train being parted or separated while the train is in motion, due to the fact that when the air coupler automatically uncouples the air of the air line is automatically shut off and the brakes released.

A still further purpose is to provide an automatic air coupler, wherein in case either or both of the units of the coupler become damaged, they can be easily and very quickly replaced.

A still further purpose is to provide a coupler of this kind, wherein in the event the cars of a train bump together, the automatic air coupler is of such character as to withstand resistance, and the heavier the train pulls, the tighter the air coupler holds, and in the event the train is taking a down grade the train is airproof, and furthermore it is not possible to tamper with the air line while the train is in motion.

It is to be understood that the particulars herein given are in no way limitative, and that while still keeping within the scope of the invention, any desired modification of details and proportions may be made in the construction of the appliance according to circumstances.

The invention comprises further features and combination of parts to be hereinafter set forth, shown in the drawings and claimed.

Figure 1 is a view in side elevation showing two units of the improved automatic air coupler connected.

Figure 2 is a sectional view of the improved automatic air coupler, showing the two units of the coupler connected and the check valves actuated.

Figure 3 is a sectional view of one of the automatic air coupling units illustrating the check valve in a closed position and the actuating plunger in its normal position.

Figure 4 is a transverse sectional view on line 4—4 of Figure 3.

Referring to the drawings 1 identifies a conventional type of draw bar carrying the shank 2 of a conventional car coupler 3, and suspended from the bar 1 and a beam 4 thereon are guiding supports or hangers, 5, 6, and 7 for the suspension of the air line 8, which is coupled at 9 to the usual air hose 10.

Surrounding the air line 8 and interposed between collars 11 (one on each side of the hanger or support 6) and the collars 12 (which are secured at 13 to the air line) are coil springs 14 and 15. The spring 15 has a little greater resistance to compression than the spring 14, thereby retaining the air coupling unit 16 slightly beyond the end face of the conventional car coupler 3, so that when two cars of a train come together both units 16 will automatically unite as they recede, the springs 14 and 15 acting to equalize according to the vibration of the cars of the train and when taking the curves.

Each air coupler unit comprises a casing having a flat outer face with a female element or socket 17 extending inwardly therefrom and a male element or nozzle 18 extending outwardly therefrom, said male element or nozzle having a reduced shank 19 which is threaded at 20 into the casing 21 of the air coupler. The male element or nozzle has a passage 22 which com-

municates with a passage 23 in the casing 21. The male element or nozzle also has a tapered portion 24, which receives or carries a similarly tapered rubber gasket 25, which enters the tapered portion 26 of the female element of an adjacent air coupler unit. The male element or nozzle beyond the tapered gasket carrying portion has an extension 27 which is cylindrical to enter a cylindrical portion 28 of the female element of an adjacent air coupler unit. The extreme end of the extension 27 is closed, but in the cylindrical wall thereof an opening 29 is provided.

This opening 29 of the extension 27 of the male element or nozzle communicates with a chamber 30 of the casing 21 of an adjacent air coupler unit. This chamber 30 as will be noted not only communicates with the passage 23, but also with a passage 31 in the casing 21 which in turn communicates with a passage 32 formed in the reduced part 33 of the casing 21. However, intervening the passages 31 and 32 a shoulder constituting a check valve seat 34 is provided, there being a check valve 35 for cooperation with said seat for shutting off communication between the two passages 31 and 32, and an angle leaf spring 36 cooperates with the check valve 35 in addition to the pressure of air in the train line to retain the check valve normally closed and thereby prevent escape of air pressure from the train line.

A suitable reducer or coupling 37 is threaded to the reduced part 33 of the casing 21, there being an air line pipe or conduit 8 threaded at 39 into the reducer, in which case the chamber 32 and the passage of the air line communicate.

The chamber 30 is formed transversely of the casing 21, and is closed by means of a suitable plate 40 bolted or otherwise secured at 41 over the opening leading to the chamber 30. By removal of this plate (there being a rubber gasket 42 between it and the side face of the air coupling unit), it is possible to gain access to the chamber 30 for the insertion or assembly of a plunger 43 which is adapted to be actuated by the extension 27, for opening the check valve 35, thereby cutting in the air from the air line of one car to the air line of an adjacent car of a train.

This plunger or actuator 43 for the check valve is angular, and its lateral portion 44 is mounted on and carried by a sliding pin 45, the extremity of a reduced extension 46 of the pin is headed or swaged over as shown at 47 to retain the portion 44 on the pin. Surrounding the shank 48 of the pin and between a shoulder 49 thereof and a plug 50 threaded into the casing 21 is a coil spring 51, the shank of the pin being guided in the plug 50, while the body of the pin is guided in a bore 52. The rear end of the pin beyond the plug has a nut 53 threaded thereon using a cotter pin 54 as a safety precaution for the nut, to limit the forward movement of the pin and the plunger. A portion 55 of the plunger 43 has a tapered head 56, the apex of which is in close proximity to the check valve 35.

Obviously when two cars of a train come together, the male elements or nozzles entering the female elements of adjacent air coupler units, the two units receding relative to the cars against the actions of the equalizing springs on the air line, the extensions 27 enter the cylindrical passages 28 and engage with the heads or swaged over portions 47 of the yieldably guided pins 45, thereby actuating the plungers, in which event the apexes of the heads of the plungers bear upon the respective check valves, and thereby cut in the air from the air line of one car with the air line of an adjacent car.

The invention having been set forth, what is claimed is:

An automatic air coupler for trains, comprising slidably mounted spring pressed substantially similar cooperating units, each including a casing provided with a central chamber and having a flat outer face with a socket extending inwardly therefrom, a male element having a passage therethrough communicating with the chamber and detachably secured in the casing to extend outwardly from the flat face to be received in the socket of a companion unit, a hollow reduced portion extending rearwardly from the casing for communication with the air line, said casing having a passage therein between the chamber and the hollow portion, an angle leaf spring secured in the hollow portion, a check valve loosely carried by the spring to control the latter passage and being normally held closed by the spring, an angle plunger depending into the chamber and extending in the latter passage, a head on the plunger engageable with the valve to open the same, spring pressed means carrying the plunger and normally holding the head away from the valve, said spring pressed means being arranged in the path of a male element of a companion unit received in the socket for moving the head against the valve to open the latter when the units are in face to face relation, access means to the chamber and a detachable closure therefor.

GEORGE MILLER.