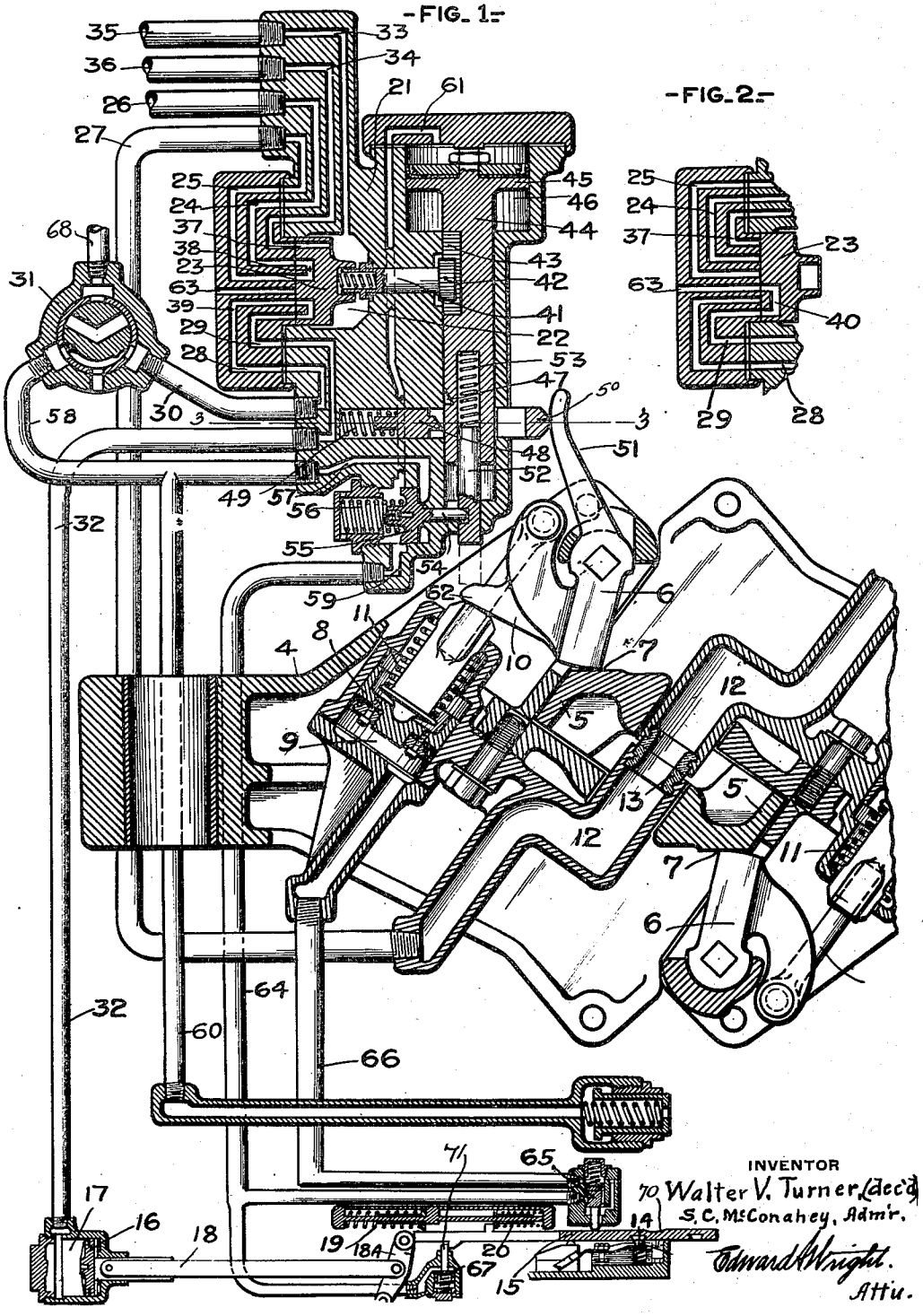
April 1, 1924. 1,488,569

W. V. TURNER

COMBINED CAR, TRAIN PIPE, AND ELECTRIC COUPLER

Filed May 22, 1919 2 Sheets-Sheet 1

-FIG. 1-



-FIG. 2-

INVENTOR

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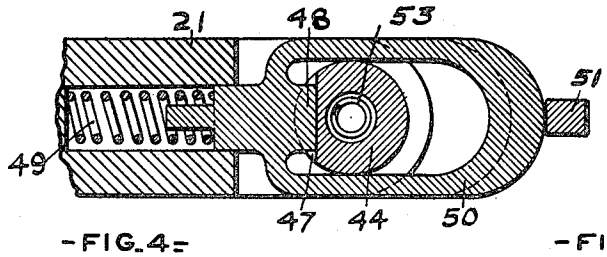
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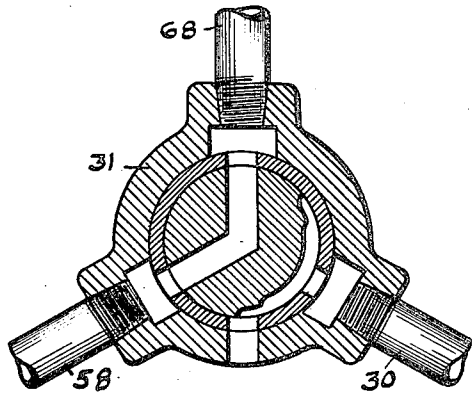
COMBINED CAR, TRAIN PIPE, AND ELECTRIC COUPLER

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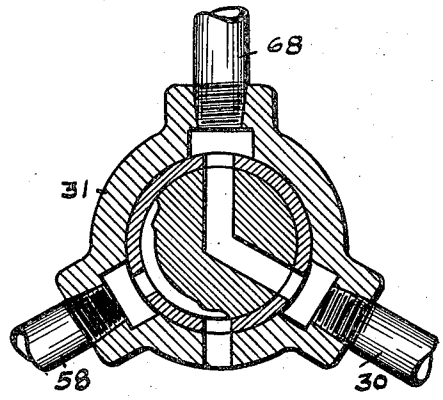
-FIG. 3.-



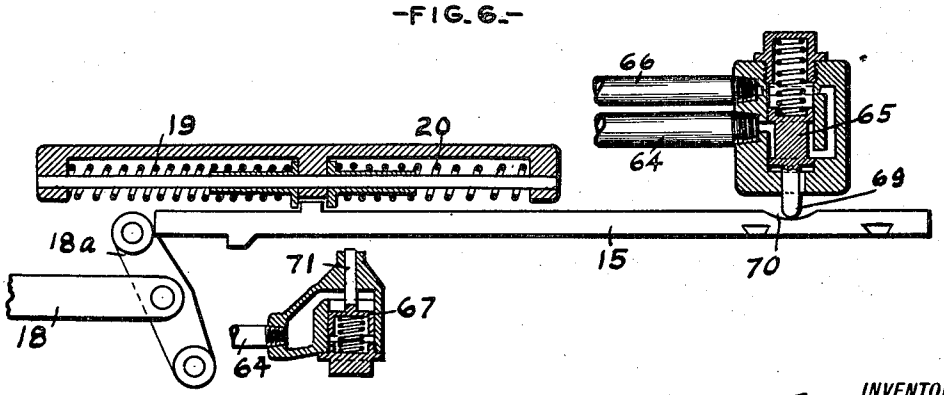
-FIG. 4.-



-FIG. 5.-



-FIG. 6.-



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Patented Apr. 1, 1924. 1,488,569

UNITED STATES PATENT OFFICE.

WALTER V. TURNER, DECEASED, LATE OF WILKINSBURG, PENNSYLVANIA; BY SAMUEL C. McCONAHEY, ADMINISTRATOR, OF EDGEWOOD, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE AIR BRAKE COMPANY, OF WILMERDING, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

COMBINED CAR, TRAIN PIPE, AND ELECTRIC COUPLER.

Application filed May 22, 1919. Serial No. 299,016.

To all whom it may concern:

Be it known that WALTER V. TURNER, deceased, late a citizen of the United States, and resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, has invented a certain new and useful Improvement in Combined Car, Train Pipe, and Electric Couplers, of which improvement the following is a specification.

This invention relates to car couplings, and more particularly to that type of coupling in which the counterpart coupler heads are adapted to be rigidly locked together, and also provided with means for connecting the train pipe passages and the electric wire connections between the cars.

Automatic couplers of this type have heretofore been employed having pivoted latch levers for locking the counterpart coupler heads together, pistons actuated by fluid pressure for releasing the locks, automatic valve devices for controlling communication through the connected train pipe passages, and a movable slide or contact carrier adapted to be projected by fluid pressure, to establish electric communication between the corresponding circuits on the connected cars. In some of these prior constructions, there is a possibility that the coupler heads may not be fully coupled before the train pipe passage is partly opened, or before the electric contact slide is moved outward, in which case there may be a leakage or venting of air from the train brake pipe which will produce an undesired application of the brakes, and the electric contact carrier may become damaged by a further lateral movement of the adjoining coupler head. It might also happen that coupler heads become unlocked for uncoupling, before the train pipe passage is fully closed and the electric contact carrier withdrawn, which might produce the same undesirable conditions with the consequent damage and delay.

The object of this invention is to overcome these objections, and it comprises an improved valve device for controlling the train pipe passage and movement of the contact carrier, the same being so connected with, and actuated by, the movable latch or locking lever of the coupler, as to prevent the opening of the train pipe passage and the projection of the contact carrier until the coupler lock has moved to its fully locked position, and which will also prevent the release of the coupler lock until the train pipe passage is closed and the contact carrier withdrawn.

In the accompanying drawing: Figure 1 is a diagrammatic sectional view, showing one form of coupling embodying this improvement; Fig. 2, a sectional view showing the closed position of the valve; Fig. 3, a transverse section, taken on the line 3—3 of Fig. 1; Figs. 4 and 5, sectional views, showing the manually operated valve in different positions; and, Fig. 6, a diagrammatic sectional view, showing the electric coupler with the slide withdrawn to the position for uncoupling.

The coupler head may be of the usual rigid lock type having a casting, 4, provided with a hook-shaped projection or nose, 5, adapted to interlock by a forward and lateral movement with the corresponding projection of a counterpart coupler head, a movable latch or pivoted locking lever, 6, adapted to engage a clamping surface, 7, on the nose of the counterpart coupler, a piston, 8, mounted in cylinder, 9, and connected by a rod, 10, with the locking lever, and a spring, 11, for normally moving the latch to its locked position. The coupler head is also provided with one or more train pipe passages, 12, adapted to be connected at the face of the coupler by means of a gasket, 13, with the corresponding gasket opening in the counterpart coupler head. The electric portion which is usually attached beneath the coupler head is indicated as comprising the usual contact carrier or slide, 15, having suitable contacts for co-operating with the respective contacts, 14, of the car line circuits, piston, 16, mounted in cylinder, 17, and connected by rod, 18, and lever, 18ª, with the contact slide, 15, and springs, 19 and 20, acting on said slide and tending to move the same to its intermediate neutral position.

One form of valve device embodying the invention is indicated as comprising a casing, 21, having valve chamber, 22, valve, 23, ports, 24 and 25, communicating, respectively with the train brake pipe, 26, of the car, and a pipe or passage, 27, leading to

the brake pipe passage, 12, of the coupler head, and ports, 28 and 29, for communication from pipe, 30, and manual valve, 31, to the pipe, 32, and operating cylinder 17, of the slide. Ports, 33 and 34, may also be employed for making connections between sections, 35 and 36, of the main reservoir pipe, it being understood that pipe, 36, communicates with a passage similar to train pipe passage, 12, in the coupler head. The valve, 23, which has suitable ports, 37, 38, 39, and 40 for co-operating with the ports in the casing may be operated in various ways, but is shown as a rotary valve having stem, 41, carrying a pinion, 42, meshing with a rack, 43, on the stem, 44, of a piston, 45, mounted in a cylindrical chamber 46, to which compressed air may be supplied for turning the valve in one direction. The stem, 44, is provided with a notch, 47, for a detent, 48, actuated by a spring, 49, and having an extension 50, adapted to be engaged by an arm, 51, on the pivoted locking lever, 6, of the coupler. The stem, 44, also has an extensible section, 52, with a spring, 53, between said sections, and a notch for engaging the locking stem, 54, connected to a piston, 55, and bearing against the spring, 56. A port, 57, leads from pipe, 58, and the manual valve to the top of the piston, 55, while another port, 61, leads to the chamber of piston, 45, and pipe, 58, communicates by pipe or passage, 60, with the corresponding parts in the counterpart coupler.

The operation of the device is as follows: When the two couplers are coupled together, as indicated in Fig. 1, the valve, 23, is in its open position in which communication is established from pipe, 26, to pipe, 27, and passage, 12, through the coupler for the continuous flow of air through the brake pipe of the train. The main reservoir pipe connection is also open and connection is made from the pipe, 30, to the pipe, 32. The locking stem, 54, engages the notch in the stem, 52, and the piston 45 is held at the inner end of its stroke. When it is desired to uncouple and separate the cars the manual valve, 31, upon one of the cars, is turned to its uncoupling position, shown in Fig. 4, in which compressed air from the supply pipe 68 flows through pipe, 58, and port, 57, to the top of piston, 55, moving the same inward against the spring, 56, and withdrawing the locking stem, 54, from its notch in the stem, 52. The compressed air then flows through port, 61, to the face of piston, 45, thus moving the same outward to rotate the stem, 41, and turn the valve, 23, to its closed position indicated in Fig. 2, in which communication through the train brake pipe and the main reservoir pipe is completely closed, and communication from pipe, 32, and the operating cylinder, 17, is open through ports, 29 and 40, to the exhaust port, 63. Air also flows through pipe, 60, to the corresponding parts on the counterpart coupler where the valve, 23, is moved to its closed position in a similar manner. At this time the manual valve, 31, on the other car, is in its normal position, as indicated in Fig. 1, with pipe, 58, connected to the exhaust through a restricted port. This permits a slight discharge of compressed air to the atmosphere, but not sufficient to prevent the accumulation of pressure on piston, 55, and the operation of the valve, 23, as above described. When the small piston, 55, moves outward against its spring, 56, air flows through port, 59, and pipe, 64, to small valve, 65, and to the stem 71 releasing piston, 67, thereby withdrawing the stem and releasing the slide, 15. As the operating cylinder, 17, of each coupler is then open to the atmosphere, the contact slide, 15, whichever one has been extended, is then withdrawn, and both slides are returned to their neutral positions by means of springs 19 and 20. When the neutral position is reached, the stem, 69, enters the recess, 70, as shown in Fig. 6, and the small valve, 65, opens communication from pipe, 64, to pipe, 66, and the lock releasing cylinder, 9, whereby the piston, 8, releases the locking lever, 6, upon each coupler and the cars are then free to separate. After the couplers are pulled apart, the manual valve is turned back to the middle or neutral position, and the air is exhausted from the cylinders, 9 and 17, in the usual way.

When the two couplers are brought together for coupling, the nose, 5, of one coupler slides along the face of the other coupler, and first depresses the latch, 6, which movement raises the arms, 51, from projection, 50, and allows the detent, 48, to engage the notch, 47, and hold the stem, 44, as indicated in Fig. 3. During the further movement of the latch or locking lever, 6, upon its pivot, the cam portion, 62, pushes in the stem, 52, against the spring, 47, until the locking pin, 54, engages its notch in the stem, 52, and holds the spring, 53, compressed. Then as the nose, 5, of the coupler reaches its seat, the locking lever, 6, moves forward upon the clamping surface, thus locking the couplers together, and at the same time the arm, 51, strikes the projection, 50, and releases the detent, 48, whereupon the spring, 53, immediately expands and moves the stem, 44, and piston, 45, back to the inner end of piston chamber, 46. This movement operates to turn the rotary valve, 23, to its open position, as shown in Fig. 1, in which communication is established through the train pipe connections. Communication is also established from the manual valve and pipe, 30, to pipe, 32, and the operating cylinder, 17, so that as the

manual valve is then turned to the slide projecting position, shown in Fig. 5, air flows from pipe, 68, through pipe, 30, ports, 28, 29, and pipe, 32, to cylinder, 17, where it acts upon the piston, 16, to project the contact slide, 15, outward into the adjoining coupler and establish the electrical connections in the usual way.

It will now be apparent that by means of this improvement, the train pipe passages will not be opened until after the coupler heads are securely locked together in coupling, and that the contact slide cannot be extended until after the train pipe valve device has moved to its open position. Also that, when uncoupling, the train pipe valve must first be closed, and the contact slide withdrawn before the releasing pistons are operated to unlock the latches of the couplers.

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

1. In a car coupler, the combination with a coupler head having a movable lock, and a train pipe passage adapted to be connected with the corresponding passage of the adjoining coupler, of a valve for controlling said train pipe passage, and means operated by the final movement of the lock to its locked position in the act of coupling, for automatically opening said valve.

2. In a car coupler, the combination with a coupler head having a movable lock, and a train pipe passage adapted to be connected to the corresponding passage of the counterpart coupler, of a valve for controlling said train pipe passage, a spring and a mechanical connection for opening said valve, and means operated by the preliminary movement of said lock in coupling to compress said spring, and by the final movement to the locked position to release said spring.

3. In a car coupler, the combination with a coupler head having a movable lock, and a train pipe passage adapted to be connected to the corresponding passage of the counterpart coupler, of a valve for controlling said train pipe passage, a stem having a connection for actuating the valve, a spring bearing against said stem, means operated by the preliminary movement of the lock in coupling to compress said spring, a detent for holding the stem as the spring is compressed, and means actuated by the final movement of the lock to release the detent.

4. In a car coupler, the combination with a coupler head having a movable lock, and a train pipe passage adapted to be connected to the corresponding passage of the counterpart coupler, of a valve for controlling said train pipe passage, a sectional stem with a spring between said sections, the one section being connected to operate the valve and the other section adapted to be engaged by the coupler lock to compress the spring in coupling, a detent for holding the one section of the stem during the preliminary movement of the lock, a locking pin for holding the other section of the stem when compressed, and an arm actuated by the final movement of the lock to release said detent.

5. In a car coupler, the combination with a coupler head having a movable lock, and a train pipe passage adapted to be connected to the corresponding passage of the counterpart coupler, of a valve for controlling said train pipe passage, a spring for moving the valve to one position, a piston for moving the valve to its opposite position, and means operated by the movement of the lock in coupling for first setting and then releasing said spring.

6. In a car coupler, the combination with a coupler head having a movable lock, and a train pipe passage adapted to be connected to the corresponding passage of the counterpart coupler, of a valve for controlling said train pipe passage, a piston for closing said valve, a spring for opening same, means operated by the movement of the lock for compressing said spring, a locking stem for holding the spring, a piston for releasing said locking stem, and means for supplying fluid to both of said pistons.

7. In a car coupler, the combination with a coupler head having a movable lock, and a train pipe passage adapted to be connected to the corresponding passage of the counterpart coupler, of a valve for controlling said train pipe passage, a piston for closing said valve, a spring for opening same, means operated by the movement of the lock for compressing said spring, a locking stem for holding the spring, a piston for releasing said locking stem, and a port controlled by the movement of the locking stem piston for supplying fluid to the valve operating piston.

8. In a car coupler, the combination with a coupler head having a movable lock, and a train pipe passage adapted to be connected to the corresponding passage of the counterpart coupler, of a valve for controlling said train pipe passage, a piston for closing said valve, a spring for opening same, means operated by the movement of the lock for compressing said spring, a locking stem for holding the spring, a piston for releasing said locking stem, a piston for releasing the coupler lock, and means for supplying fluid first to the stem locking piston and then to the other two pistons.

9. In a coupler, the combination with a coupler head having a movable lock for holding the counterpart coupler heads together, and a train pipe passage adapted to be connected to the corresponding passage

of the counterpart coupler, of an electric portion adapted to be projected, for establishing electrical connections, a cylinder and piston for actuating said electric portion, a valve having ports for controlling said train pipe passage and a passage leading to the cylinder of the electric portion, and means controlled by the movement of the coupler lock for operating said valve.

10. In a coupler, the combination with a coupler head having a movable lock for holding the counterpart coupler heads together, and a train pipe passage adapted to be connected to the corresponding passage of the counterpart coupler, of an electric portion adapted to be projected, for establishing electrical connections, a cylinder and piston for actuating said electric portion, a valve having means for opening the train pipe passage and a supply passage to the electric portion cylinder in one position, and for closing the train pipe passage and opening an exhaust from said electric portion cylinder in another position, means controlled by the movement of the coupler lock for moving the valve to one position, and a fluid pressure device for moving the valve to the other position.

In testimony whereof I have hereunto set my hand.

SAMUEL C. McCONAHEY,
Administrator of the estate of Walter V. Turner, deceased.