

(No Model.)

2 Sheets—Sheet 1.

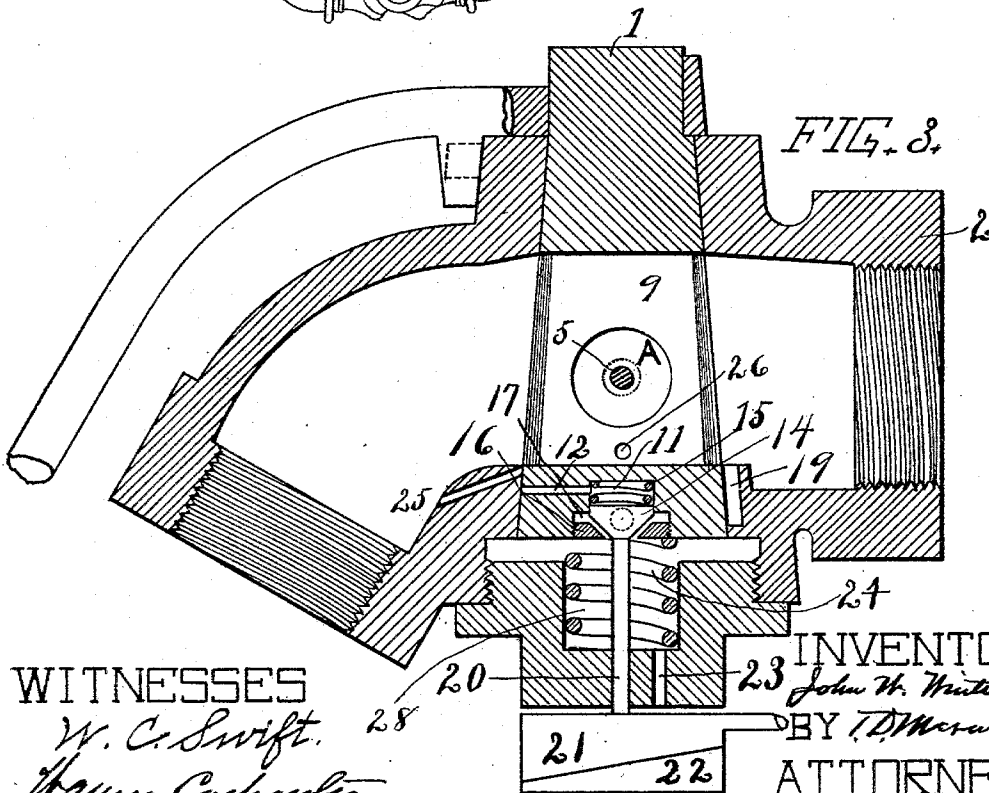
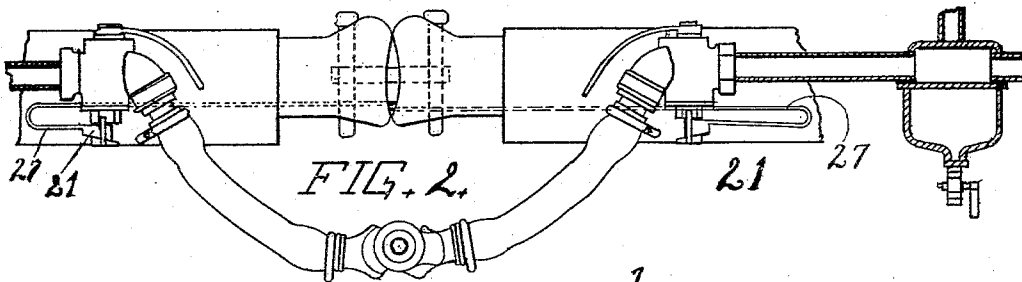
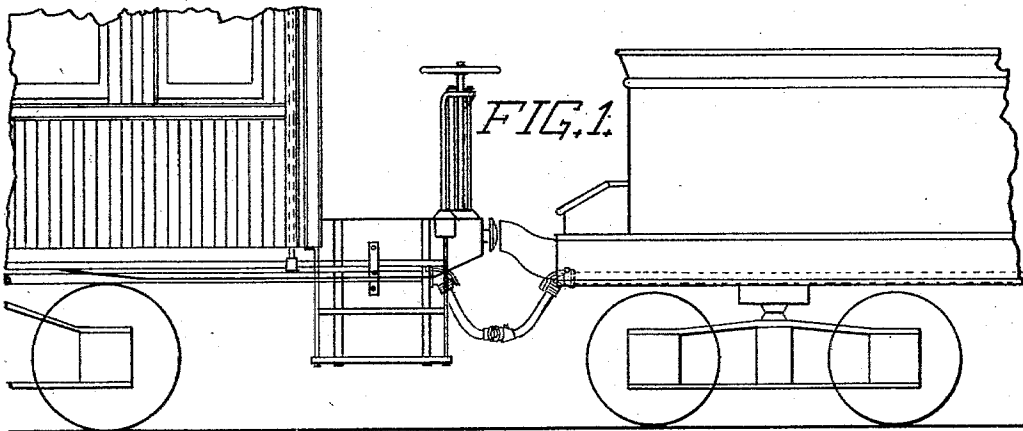
J. W. WINTERS, Dec'd.

C. B. BRUNSON, Administrator.

AUTOMATIC SAFETY ANGLE COCK.

No. 571,735.

Patented Nov. 17, 1896.



WITNESSES

W. C. Swift.
Hamer Carpenter

INVENTOR
John W. Winters
BY T. D. McFarland
ATTORNEY.

(No Model.)

2 Sheets—Sheet 2.

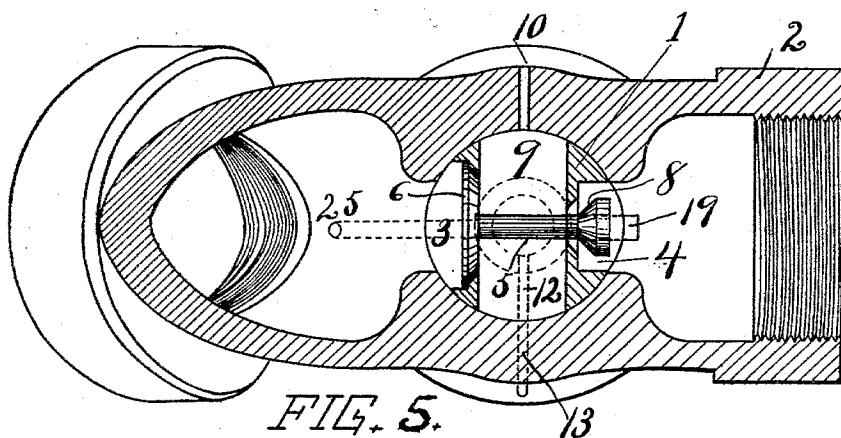
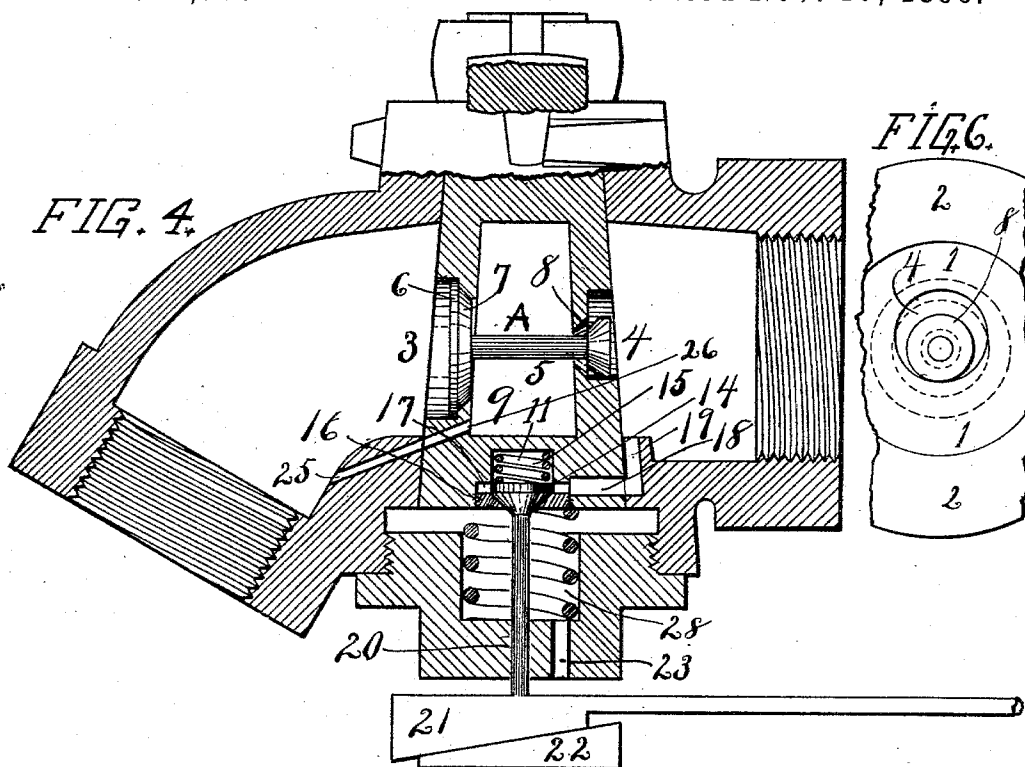
J. W. WINTERS, Dec'd.

C. B. BRUNSON, Administrator.

AUTOMATIC SAFETY ANGLE COCK.

No. 571,735.

Patented Nov. 17, 1896.



WITNESSES

W. C. Swift.
H. C. Carpenter.

INVENTOR
BY *John W. Winters*
T. D. Winters
ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN W. WINTERS, OF ST. PAUL, MINNESOTA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF FIVE-EIGHTHS TO MARY O'BRIEN, MARY L. GELINA, JOHN GELINA, ALBERT J. KOS, DEVILLE H. KENT, AND AUGUST JOHNSON, OF SAME PLACE; CHARLES B. BRUNSON ADMINISTRATOR OF SAID WINTERS, DECEASED.

AUTOMATIC SAFETY ANGLE-COCK.

SPECIFICATION forming part of Letters Patent No. 571,735, dated November 17, 1896.

Application filed November 21, 1893. Serial No. 491,542. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. WINTERS, of St. Paul, Ramsey county, Minnesota, have invented certain Improvements in Automatic Safety Angle-Cocks, of which the following is a specification.

My invention relates to improvements in plug-valves or angle-cocks which are used on the ends of train-pipes in fluid-pressure brake systems, its object being to provide means for detecting any unauthorized closing of the valves by causing the brakes to be automatically set on the sections of the train in quick succession upon the closing of the valve, whereby the train is protected from injury by reason of the inability of the engineer to control the brakes, as would happen if the train was started with any of the valves closed. Another object is, by automatically applying the brakes, to prevent the starting of the train while the hose is uncoupled between any of the cars of the train.

To this end my invention consists in providing a valve-controlled exhaust for the air in the train-pipe, in case of the turning of the cock, which valve is controlled by the pressure in the hose, and remains opened so long as the hose is coupled, thus after a short interval causing the brakes to be applied.

It further consists in an outlet for the air in the hose connected to the cock, which outlet remains open so long as the angle-cock is closed, thus exhausting the air in the hose and its connected portion of the train-pipe, thus causing in such case the brakes to be applied to the remainder of the train.

It further consists in a valve-controlled outlet for the air in the train-pipe connected to the angle-cock when the cock is closed, said valve controlling said outlet being normally closed, but being automatically opened to allow the escape of the air when the bumpers of the car and one adjacent to it come in contact, thus compelling the trainman to couple the hose and open the angle-cock before the train can proceed.

My invention further consists in the con-

struction and combination hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of part of an engine-tender and passenger-coach coupled thereto, and provided with train-pipe, angle-cocks, and hose. Fig. 2 is an enlarged detail of the car-bumpers, train-pipe, angle-cocks, and hose. Fig. 3 is a central longitudinal vertical section of an angle-cock with my improved attachment, the cock being shown open. Fig. 4 is a similar section of the cock in closed position. Fig. 5 is a longitudinal horizontal section of the angle-cock shown in closed position, and Fig. 6 is a detail end elevation of the valve in the cock-plug.

In the drawings, the plug 1, fitted in the ordinary manner in the casing 2 of the cock and supported in place by means of the spring 24 in the ordinary manner, is socketed or chambered out on opposite sides, as shown in Figs. 4 and 5, thus forming a cylindrical socket or chamber 3 on the hose side of the plug when the cock is closed and the similar but smaller chamber 4 on the train-pipe side, each of these chambers or sockets having a port opening into the passage 9 through the plug. Carried by the valve-stem 5, which passes through the ports, is a piston 6, having a valve part 7, and working in the chamber 3, and the valve 8, which lies upon the bottom of the chamber 4, the respective ports serving as seats for the valves, and the stem 5 being of such length that only one valve can be seated at the same time.

The casing 2 is provided with the lateral port 10, which places the opening 9 in the plug in communication with the outer air when the cock is closed. (See Fig. 5.) The plug is also provided with a port 26, which registers with the passage 25 in the casing 2, opening into the cock toward the hose, when the cock is in closed position. (See Fig. 4.)

When the hose are coupled, if the cock is closed, the double valve A, made up as de-

scribed, of the piston 6, having the valve part 7 and the valve 8, connected by the stem 5, is operated so as to open the valve 8 by means of the air-pressure in the hose acting upon the considerably larger surface of the piston 6, as compared with the surface of the valve 8, thus allowing the air to escape from the adjacent train-pipe through the port controlled by the valve 8 and port 10. At the same time the air is allowed to gradually exhaust from the hose and its connected part of the train-pipe through the ports 25 26, the plug-openings, and port 10, so that if the cock is closed for a limited time the air will exhaust sufficiently from the entire train-pipe to apply the brakes, yet allowing sufficient time for a trainman to uncouple the hose after turning the cock, before the air is exhausted, so as to apply the brakes. The instant the hose is thus uncoupled the pressure is removed from the piston 6, and the pressure in the train-pipe will immediately close the valve 8.

In order to prevent the possibility of a train being started while the hose between the cars remains uncoupled, I provide means for allowing the air to exhaust from the train-pipe after the cars are brought together until the hose is coupled, thus causing the brakes to be applied if the trainman neglects to perform his duty. For this purpose I provide the chamber 17, in the bottom of the plug 1, having the valve-seat 16, in which is normally seated the valve 14, which works in the smaller chamber 11 and is held down by the weak spring 15. The chamber 11 is in communication with the outer air by means of the registering passages 12 and 13 when the cock is closed. The stem 20 of the valve 14 projects downward below the angle-cock and nearly into contact with the removable wedge 21, which rides upon the fixed wedge 22, having suitable fixed support. The wedge 21 is carried by the rod 27, bent upon itself and extending through the car-bumper, so as to project slightly beyond it. (See Fig. 2.) It will thus be seen that when the cars are brought together with their bumpers in position for coupling the wedges 21 will be forced back, so as to lift their valves 14, as shown in Fig. 3. The plug 1 has a passage 18, communicating with the chamber 17 and also with the passage 19, which leads to the train-pipe. The chamber 28, in which is arranged the spring 24, also has an eduction port or passage 23. Consequently, the angle-cock being closed, when the valve 14 is lifted, as described, the air is allowed to exhaust through the passages 19 and 18, the valve-opening, and the passage 23 from the train-pipe to the open air until the cock is opened.

Operation: When the angle-cock is turned by an unauthorized person so as to close it, the air immediately begins to exhaust from the train-pipe at both sides of the cock in the manner above described, thus in time setting the brakes and giving a signal by reason of the exhaust through the port 10, so as to notify the trainmen as to which cock has been

tampered with. In the ordinary service, when it is desired to cut out cars, the trainmen, after closing the cocks, will be compelled to immediately uncouple the hose, so as to allow the valve 8 to close without setting the brakes. When cars are brought together to be coupled, the trainmen must immediately couple the hose and open the angle-cocks to prevent the brakes being set by the exhausting of the air from the train-pipe through the valves 14 in the manner described.

It will thus be seen that any tampering with the angle-cocks is immediately detected and all injury prevented by the automatic application of the brakes, and all neglect of duty on the part of the trainmen in coupling and uncoupling the hose is absolutely detected. It will also be seen that cars may be uncoupled for switching and other purposes by prompt action of the trainmen in closing the angle-cocks and uncoupling the hose, thereby retaining the necessary pressure in the train-pipe to prevent application of the brakes while the cars are being handled.

I claim—

1. A plug-valve provided with an auxiliary valve arranged in the plug and having heads of different areas, substantially as shown and described.

2. A plug-valve comprising a valve-body adapted to connect with the train-pipe and with the hose, provided with an air-outlet in one side, a plug mounted to turn in the said valve-body and having a port adapted to connect the ends of the said valve-body with each other or to register with said air-outlet, and an auxiliary valve fitted to slide transversely across the said plug-port to connect one or both ends of the valve-body with the said port at the time the plug is closed and its port registers with the said air-outlet, said auxiliary valve being provided with heads of different areas, substantially as shown and described.

3. The combination with the valve-body and its plug-valve having a transverse opening by means of which the ends of the body can be put into communication with each other, of means actuated by the pressure on one side of said plug when closed for opening communication between the other end of the valve-body and the outer air.

4. The combination with the plug-valve, of a transverse auxiliary valve slidable therein, having two heads of different areas.

5. In a fluid-pressure brake system, the combination with the angle-cock valve-body and its plug-valve having a transverse opening for establishing communication between the ends of the body and an opening communicating with the hose end of the valve-body for gradually exhausting the pressure therein to the outer air, of means actuated by the pressure in the connected hose for opening communication between the other end of the valve-body and the outer air.

6. In a fluid-pressure brake system, the

combination with the angle-cock valve-body, of the plug-valve therefor having a passage for establishing communication between the ends of the valve-body, and an opening for establishing communication between the hose end of the cock and the outer air when the plug is turned to closed position, and means actuated by the pressure in the connected hose when the plug is in closed position for establishing communication between the train-pipe end of the cock and the outer air.

7. The combination with the angle-cock of an air-brake system, having a lateral release-port communicating with the plug-opening when the cock is closed, of two stem-connected piston-valves arranged in the plug of the cock at substantially right angles with the plug-opening, the stem being of such length that only one valve can be seated at a time, the valve adapted to be turned toward the hose end of the cock being larger than the other, substantially as described.

8. The combination with the angle-cock of an air-brake system having a port communicating with the train-pipe when the cock is turned to close the pipe, of the valve for said port adapted to be opened automatically by the pressure of the air in the coupled hose, and to be closed by the pressure in the train-pipe when the pressure in the hose is relieved, substantially as described.

9. The combination with the angle-cock of an air-brake system, provided with a lateral eduction-port in communication with the train-pipe when the cock is closed, of the valve adapted to automatically open said port while pressure remains in the hose connected to the angle-cock, and to automatically close the port when such pressure is removed.

10. The combination with the angle-cock of an air-brake system, of automatic means actuated by the air-pressure in the connected hose for exhausting air from the connected train-pipe when the angle-cock is closed.

11. The combination with the angle-cock of an air-brake system, having a lateral release-port communicating with the plug-opening when the cock is closed, and its plug having

a port connecting the plug-opening with the train-pipe when the cock is closed, of the valve for said plug-port adapted to be opened by the pressure in the connected hose and to be closed by the pressure in the train-pipe when the pressure is removed from the hose, substantially as described.

12. The combination with the angle-cock of an air-brake system, having a release-port communicating with the plug-opening when the cock is closed, and its plug having a lateral port connecting the plug-opening with the adjacent train-pipe when the cock is closed, of the valve adapted to close the port in said plug, its stem and the piston carried by said stem and working in a chamber in the opposite side of said plug, substantially as described.

13. The combination with the angle-cock of an air-brake system, having a port adapted to open communication between the train-pipe and the outer air when the cock is closed, of a valve normally closing said port, and means actuated by the bumper of the opposite car for opening said valve.

14. The combination with the angle-cock of an air-brake system, of the valve operated automatically by the hose-pressure for exhausting the air from the train-pipe when the cock is closed, and the valve operated by the bumper of another car for exhausting the air from the train-pipe when the cock is closed.

15. The combination with the angle-cock of an air-brake system, of means actuated by the impact of another car for exhausting the air from the train-pipe when the cock is closed.

16. The combination with the angle-cock of an air-brake system, of automatic means for exhausting the air from the train-pipe when the cock is closed and the connected hose is coupled, and means operative by the impact of another car to likewise exhaust the train-pipe when the hose is uncoupled.

In testimony whereof I have hereunto set my hand this 17th day of November, 1893.

JOHN W. WINTERS.

Witnesses:

T. D. MERWIN,
H. S. JOHNSON.