

No. 772,919.

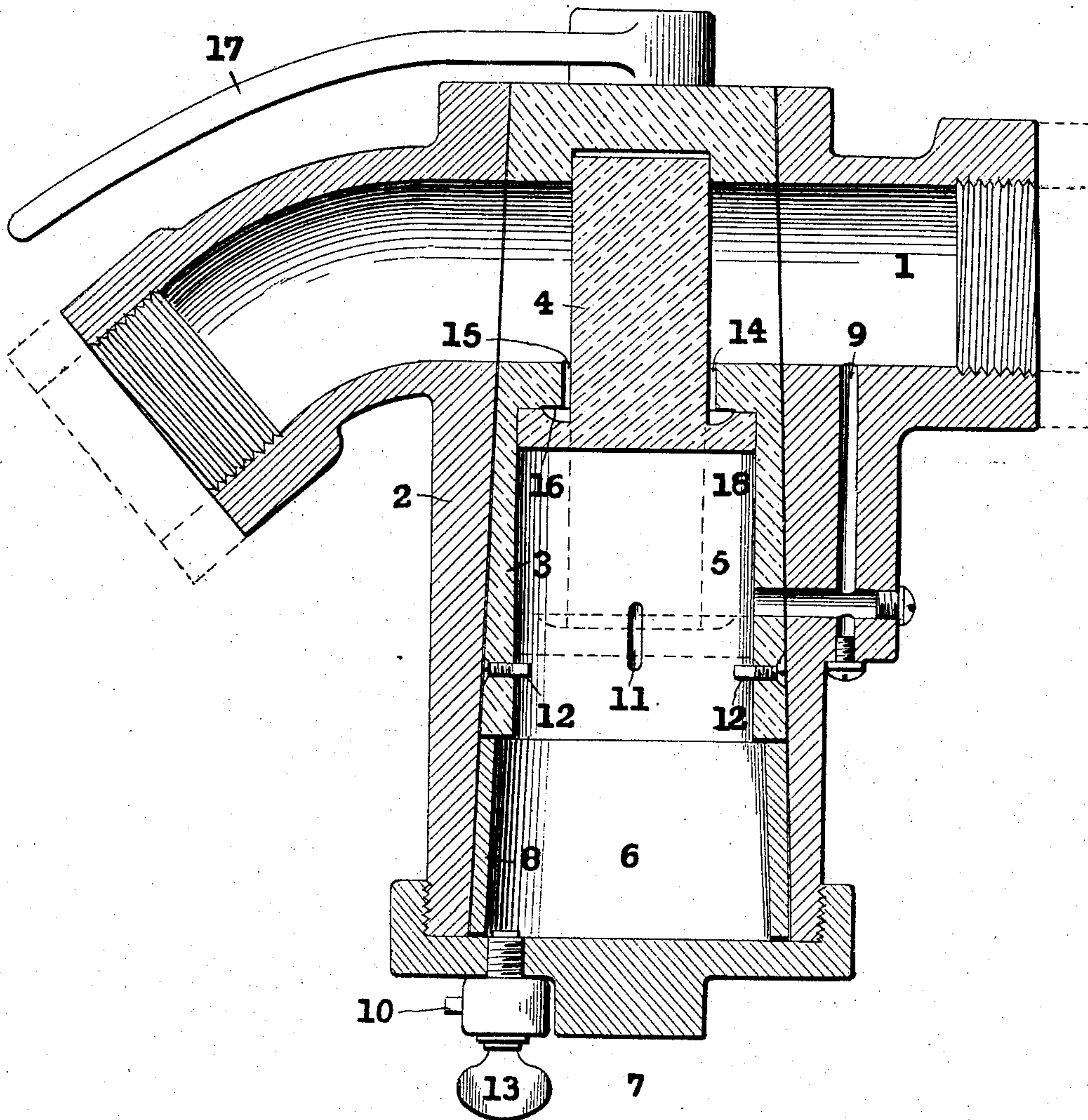
PATENTED OCT. 25, 1904.

O. P. BOWMAN.

AUTOMATIC SAFETY VALVE AND ANGLE COCK.

APPLICATION FILED JUNE 14, 1902.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY-VALVE AND ANGLE-COCK.

SPECIFICATION forming part of Letters Patent No. 772,919, dated October 25, 1904.

Application filed June 14, 1902. Serial No. 111,648. (No model.)

To all whom it may concern:

Be it known that I, OLIVER P. BOWMAN, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have
5 invented new and useful Improvements in Automatic Safety-Valves and Angle-Cocks, of which the following is a specification.

My invention relates to an automatic safety-valve in connection with an angle-cock, the
10 object being the provision of means in connection with fluid-pressure brakes whereby when a train in motion accidentally or otherwise parts the brakes will be applied gradually.

15 As is well known to those operating railway-trains, the couplings of adjacent cars sometimes become detached or a draw-bar pulls out, and incident thereto the hose-couplings of the brake system are disconnected or
20 the hose ruptured, whereupon the air escaping from the train-pipe suddenly the brakes are applied almost instantaneously, and this results in hurling the passengers from their seats and endangering life and limb, and on
25 freight-trains movable articles are displaced, the load shifted, and the individual cars are subjected to severe shocks with accompanying damage to the car-bodies and draft-rigging. The purpose of my invention is to obviate all
30 such casualties and damage by causing the rear section of the train to be brought to a stop slowly and at the same time permit the front section to advance far enough so that a collision will not take place between the two
35 sections.

My invention consists in a combined safety-valve and angle-cock and also in certain novel-
ties of construction and combinations of parts hereinafter set forth and claimed.

40 The accompanying drawing illustrates an example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principle.

45 The illustration shows an air-brake angle-cock with a valve combined therewith, the view being a longitudinal section of the complete device.

Referring to the drawing, the numeral 1 designates a passage through the cock, the
50 train-pipe being connected to the right-hand end and the coupling-hose to the left-hand end of the same; 2, the casing or wall; 3, a conically-shaped plug having a passage at the top in line with the passage 1 when the handle is
55 in the position shown and cored out at the lower end; 4, a piston and stem; 5, a chamber above the piston when the latter is in the position shown in dotted lines; 6, a chamber below the piston; 7, a threaded cap applied to
60 the end of the casing; 8, a thimble under the plug to hold it in place; 9, a passage for air to the chambers; 10, a passage from chamber 6 to the atmosphere; 11, a groove in the wall to allow air to pass from chamber 5 to cham-
65 ber 6 and equalize the pressure; 12, pins in the wall to form a seat for the valve; 13, a cock for bleeding the chambers 6 and 5 when the piston 4 is in its raised position; 14, a groove to allow air to pass to the top of the
70 piston; 15, a groove by which air can pass from the top of the piston to the atmosphere; 16, an open space on top of the piston; 17, a handle to operate the cock, and 18 represents the ground surfaces of the piston and its bear-
75 ing-seat, forming an air-tight joint.

The *modus operandi* is as follows: Supposing a train is equipped with any type of automatic fluid-pressure brake having my angle-cock and automatic safety-valves at each end
80 of the cars and the piston occupying the position shown by the dotted lines, when the engineer releases the brakes by admitting compressed air to the train-pipe it will flow by way of the passages 14, 15, and 9 to the
85 chamber 5 above the piston and thence by groove 11 to chamber 6, equal pressure being in both chambers.

Under normal conditions of service and when the train is in motion the piston will oc-
90 cupy the position shown in dotted lines. In service and emergency applications of the brakes it has been found by actual trial the piston will remain in its lowermost position or move a slight distance upwardly, but not
95 far enough to pass the top of the groove 11.

However, when the train breaks apart and the hose becomes disconnected the action is quite different. The sudden discharge of air from the train-pipe at the front end of the rear section relieves the pressure in chamber 5, and the overbalancing pressure in chamber 6 forces the piston upwardly the entire length of its travel and the stem closes the passage 1. Compressed air from the train-pipe passes to chambers 5 and 6 and holds the piston in the position shown by full lines. With the parts thus disposed the air from the train-pipe slowly discharges through grooves 14 15 to the atmosphere. It is obvious that the brakes will be applied throughout the rear section of the train gradually and without shock. When all the air in the train-pipe has exhausted to the atmosphere, the piston 4 will drop by gravity.

The safety-valve at the rear end of the front section of the train acts in a similar manner to that already described; but as the train-pipe of the front section is in communication with the main reservoir upon the locomotive the discharge of air through the grooves 14 15 will be replaced and the pressure be retained, and the brakes will not be applied until the engineer reduces the pressure in the pipe in the well-known way.

In coupling the two sections of the train when brought together the cock 13 is open, allowing the air to escape to the atmosphere from chambers 5 and 6, whereupon the piston and stem drop and open the passage 9 to chamber 5.

From the foregoing description it is clear that I have provided an automatic safety-valve in connection with an angle-cock which fulfills all the conditions set forth as the purpose and object of my invention.

While I have illustrated only one example of the physical embodiment of my said invention, I do not thereby intend to restrict the scope thereof to said example, inasmuch as the principle may be embodied in other ways and under different forms of construction.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a fluid-pressure brake and an angle-cock, of means embracing a piston and stem in connection with the plug of said angle-cock, said piston and stem being operated by fluid-pressure, which, when the couplings are separated, will be moved from normal position to a position which will close the main passage from the train-pipe through the angle-cock to the atmosphere and cause the air in the train-pipe to be gradually discharged.

2. The combination with an angle-cock having a passage 1, of a piston and stem, a chamber, a passage from passage 1 to the chamber, a groove 11, and grooves 14, 15.

3. An angle-cock having a passage 1; a cored

plug; a piston and stem; a chamber divided into an upper portion 5 and a lower portion 6 when the piston is not in operative position; and suitable passages in the cock, whereby when the air is suddenly released from the train-pipe the stem of the piston will be caused to close the passage 1 and the air in the train-pipe be gradually discharged to the atmosphere.

4. The combination with an angle-cock and the plug thereof having a chamber for compressed air, of a movable element adapted to be moved by compressed air from its normal position, where it does not obstruct the passage through the plug, to a position where it closes the said passage, and means for allowing a gradual discharge of air from the train-pipe.

5. The combination with an air-brake angle-cock, of means located outside the passage through the cock and operated by compressed air, which when the hose is separated will partially close the passage through the plug and allow air from the train-pipe to gradually escape; said means being in communication with the train-pipe and supplied with compressed air therefrom.

6. In an air-brake safety device, an angle-cock, a hollow valve-plug in said cock, a normally open valve in the plug, adapted to be thrown into closed position by the escape of air from the hollow of the plug, and means for securing a retarded flow of air around the valve when in closed position.

7. In an air-brake safety device, an air-conduit, a hollow cock having a port therethrough, adapted manually to open and to close said conduit, a valve in the cavity of said cock, adapted and arranged to automatically close said port independently of the movement of the cock, and means for securing a retarded flow of air around said valve when in closed position.

8. An angle-cock of an air-pressure line having a heart or "plug-valve" connected with and manipulated by the handle of the angle-cock, said plug-valve having a large air passage-way through it, and also a port or small by-passage-way to communicate with, and to permit air to pass into, a cylinder or auxiliary chamber, and a third opening for a plug or gate to pass into the plug-valve, to close the large air passage-way therein when the air-pressure is suddenly reduced.

9. An angle-cock of an air-brake system having a heart or plug-valve connected with the handle of the angle-cock, more than one passage-way in said plug-valve for the passage of air under pressure, an air-chamber with a piston therein, and a plug connected to said piston and adapted to be urged by air under pressure to close the large air passage-way through the angle-cock.

10. In a fluid system an angle-cock having a turnable elongated plug, a chamber in said

elongated plug so communicating with the passage-way through the angle-cock as to permit the fluid-pressure in the angle-cock to be exerted upon both sides of a piston located in said chamber to cause a stem attachment of the piston to open and close the passage-way in the angle-cock.

11. The combination, with an angle-cock, having a chamber, of a hollow valve-plug in said angle-cock and extended within said chamber, communication between said angle-cock and chamber and between said chamber and the extended portion of said valve-plug, and a movable element in said valve-plug adapted to move into the passage-way of said angle-cock and close the same when pressure is applied on one side of said element.

12. In an angle-cock of an air-brake system having a chamber, a hollow valve-plug, said valve-plug extending and forming a cylinder within said chamber, a piston and connected valve-stem in said cylinder adapted to be moved to close the passage-way in said angle-

cock, means for admitting air under pressure below said piston, and means for releasing the air below said piston when the valve-plug is turned.

13. In an air-brake system, an angle-cock with a stationary cylinder or chamber attachment, a hollow plug carrying a cylinder or chamber turnable by the handle of the angle-cock, a piston with a stem attachment in the turnable chamber within a stationary chamber, said hollow plug with its chamber and piston with stem attachment therein being so adjusted and in communication with the air-line through the angle-cock that a brakeman can control the brakes upon the cars by the manipulation of the handle of the angle-cock.

In testimony whereof I affix my signature in presence of two witnesses.

OLIVER P. BOWMAN.

Witnesses:

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CORNELL SCHREIBER.