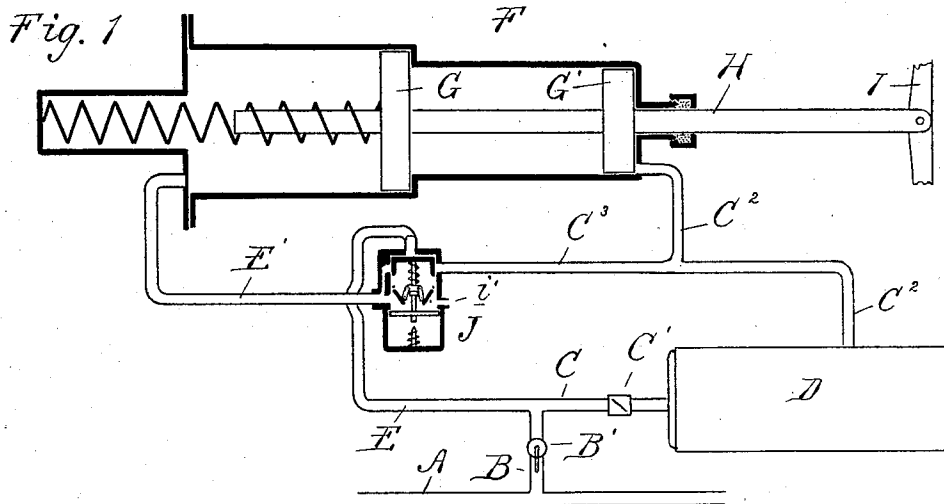
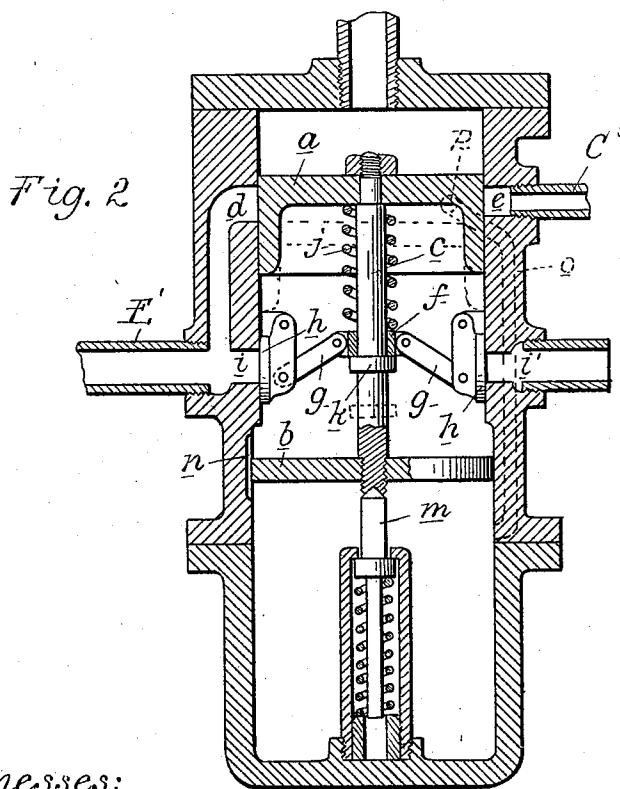


(No Model.)

W. K. OMICK.
AIR BRAKE.

No. 588,913.

Patented Aug. 24, 1897.



Witnesses:

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WILLIAM K. OMICK, OF PONTIAC, MICHIGAN, ASSIGNOR OF ONE-HALF TO
WILLIAM DUFFUS, OF SAME PLACE.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 588,913, dated August 24, 1897.

Application filed November 20, 1896. Serial No. 612,816. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM K. OMICK, a citizen of the United States, residing at Pontiac, in the county of Oakland and State of Michigan, have invented certain new and useful Improvements in Air-Brakes, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an air-brake system in which the brake equipment under the car comprises a brake-cylinder the opposite ends of which communicate, respectively, with an auxiliary reservoir and with the train-pipe, and whereby a double piston in the cylinder to which the brake-lever is connected is controlled by variations in the air-pressure in the opposite ends of the brake-cylinder.

My invention has special reference to an automatic brake-valve whereby variations of air-pressure in the train-pipe automatically effect the proper movement of the brakes, while at the same time the air-pressure in the auxiliary reservoir is equalized with that of the main reservoir, so that if by successive applications of the brakes the pressure in the main reservoir should drop below the normal before the engineer has time to restore it the normal brake action will not be disturbed.

In the accompanying drawings, which form a part of this specification, Figure 1 is a diagram plan representing my improved brake equipment, and Fig. 2 is a detached enlarged central section of the brake-valve.

A is the train-pipe.

B is a branch provided with the usual stop-valve B'.

C and E are two branches leading off from the branch B, and D is an auxiliary reservoir into which the branch C connects.

C' is a check-valve in the branch C, and F is a brake-cylinder provided with pistons G and G', of different area, moving in opposite ends of the brake-cylinder.

H is a piston-rod common to both pistons, and I is the brake-lever, to which the brakes are connected in the usual manner. (Not shown.)

J is a brake-valve comprising a cylindrical casing, in one end of which the branch pipe E communicates, and E' is a pipe leading

from the casing of the brake-valve to the larger end of the brake-cylinder.

The auxiliary reservoir is connected by a pipe C² with the smaller end of the brake-cylinder, and from this pipe C² the pipe C³ leads into the casing of the brake-valve.

The construction of the brake-valve, which is fully shown in Fig. 2, is as follows: The casing of the valve is cylindrical and contains two pistons *a b*, united by a common piston-stem *c*. The pistons *a* and *b* move in opposite ends of the cylinder, the one in which the piston *b* moves being slightly larger than the other. The piston *a* constitutes a valve which controls two ports *d* and *e* on opposite sides, the former of which leads into the pipe E' and the latter into the pipe C³. Upon the stem of the piston is sleeved the collar *f*, which is pivotally connected by toggles *g* with the hinged flap-valves *h*, arranged to control opposite ports *i i'* in the cylinder-casing, the former port leading to the pipe E' and the latter forming an exhaust into the atmosphere. The collar *f* is loosely held in position upon the stem by a coil-spring *j* pressing upon one side and by a fixed collar or projection *k* upon the other side. In the end of the valve-casing in which the larger piston operates is arranged a spring-stop *m*, against the free end of which the end of the stem *c* is adapted to strike. The cylinder also is provided with a groove *n*, leading around the piston *g*, and with a passage *o*, connecting the opposite ends of the cylinder and forming a port *p*, which is controlled by the piston *a*.

The parts being constructed and arranged as described, they are adapted to operate as follows: The air under pressure, being supplied through the train-pipe, passes through pipe B and branch C into the auxiliary reservoir, the check-valve C' serving to maintain the pressure regardless of its fall in the train-pipe. Simultaneously the air through the branch E enters into the casing of the brake-valve, but as the piston *a* is normally maintained therein in the position shown in Fig. 2 it cannot pass any farther. In this the normal position of the parts the larger end of the brake-cylinder F, being filled with compressed air and combined with a spring act-

ing against the piston G, holds the piston-rod to the right against the opposing pressure from the auxiliary reservoir against the piston-head G', and the brakes are therefore off.

5 Should, however, the pressure in the train-pipe be diminished, the piston-valve *a* becomes unbalanced and moves toward the head through which the pipe E enters. In this movement the collar *k*, pushing against

10 the loose collar *f*, carries the flap-valves to open the ports *i i'*, thereby opening a passage for the compressed air from the large end of the cylinder into the atmosphere and causing the piston-rod H to move to the left and ap-

15 ply the brakes. The opening of the flap-valves *h h* at the same time permits the compressed air in the casing of the brake-valve on the opposite sides of the piston *b* to escape into the atmosphere, and the piston *a* ceases

20 to move. Upon the pressure being restored again in the train-pipe it will act against the piston-valve *a* and drive it back, which opens the ports *d* and *e*, thereby admitting the air into the brake-cylinder, which throws off

25 the brakes and also simultaneously puts the train-pipe into connection, through the port *e* and pipe C³, with the auxiliary reservoir, which equalizes the pressure therein with that in the train-pipe. In this movement of

30 the piston-valve *a* the spring *j*, acting against the collar *f*, moves the toggles to close the flap-valves *h h*, and, further, the port *p* in being also uncovered by the piston-valve *a* causes the compressed air to pass into the op-

35 posite end of the cylinder through passage *o*, and this pressure, combined with the pressure of the stop *m*, the spring of which has been compressed, not only stops the further movement at about the position shown in

40 dotted lines, but operates to reverse the piston and move it back into the normal position shown in Fig. 2. During this movement back into the normal position it will be seen that the compressed air passes through the

45 groove *n* to the opposite side of the piston-valve *b*. The two pistons *a b* will thus practically assume a state of equilibrium, while the spring-stop M will continue to act until the piston *a* has again closed the ports *d e p*.

50 As the spring *j* has been under compression, it will still hold the flap-valves *n n* closed during the retrograde movement of the pistons. It will be seen that the piston *b* merely acts as an air-spring which controls the move-

55 ment of the piston *a* to effect the proper movement and stoppage thereof without any shock to the parts and in a manner to accommodate the movement of the valves to slight fluctuations in the air-pressure without altering their

60 prescribed movements.

What I claim as my invention is—

1. In an air-brake, the combination with the train-pipe and brake-cylinder, of an auxiliary reservoir in a branch from the train-

65 pipe, a valve in said branch between the train-pipe and auxiliary reservoir, an automatic

brake-valve located in a branch between one end of the brake-cylinder and the train-pipe, and a separate branch connecting the brake-valve with the auxiliary reservoir and a pipe

70 putting the reservoir in communication with the other end of the brake-cylinder said brake-valve operating to simultaneously establish through said branch communication

75 between the train-pipe the auxiliary reservoir and the end of the brake-cylinder to which the brake-valve is connected.

2. In an air-brake system, the combination with the train-pipe and brake-cylinder of two branches connecting the opposite ends of the

80 brake-cylinder with the train-pipe and having a common connection with said train-pipe, a check-valve and an auxiliary reservoir located in one of said branches, and an

85 automatic brake-valve located in the other one of said branches and communicating also with the auxiliary reservoir, said brake-valve operating automatically to open an exhaust-

90 port for the air from one end of the brake-cylinder upon diminution of pressure in the train-pipe and to admit air under pressure into the brake-cylinder when said pressure

95 is restored and then maintain a normal position in which said brake-cylinder is disconnected from the train-pipe.

3. In an air-brake system, the combination with the train-pipe, brake-cylinder and auxiliary reservoir, communicating with one end of the brake-cylinder, of a brake-valve, lo-

100 cated in a branch between the train-pipe and the other end of the brake-cylinder comprising a casing, freely communicating at one end with the train-pipe, and also communi-

105 cating with the other end of the brake-cylinder and auxiliary reservoir and having ports and passages adapted to simultaneously connect said end of the casing with the brake-

110 cylinder and with the auxiliary reservoir by the operation of an automatic valve and also having ports and passages controlled by a

115 separate valve adapted to connect the brake-cylinder with an exhaust into the atmosphere under the control of said automatic valve, said valve operating automatically to main-

120 tain a normal position in which all the ports and passages are closed, to move in one direction from said normal position upon diminution of pressure in the train-pipe and there-

125 by open the separate valve, and to move in the opposite direction and then back again into its normal position when the pressure is restored.

4. In an air-brake system, the combination with the train-pipe, brake-cylinder and auxiliary reservoir communicating with the train-

125 pipe and with the brake-cylinder of the brake-valve comprising a cylinder freely communicating at one end with the train-pipe and also communicating with the auxiliary reservoir

130 and with the brake-cylinder, the valve-piston in said end controlling ports for simultaneously connecting said end with the brake-cylinder and with the auxiliary reservoir, the

double flap-valve having a loose toggle connection upon the stem of the piston-valve and operated by a collar and spring upon said stem to open and close opposite ports in the
5 cylinder whereby the brake-cylinder is put into communication with an exhaust-port, the air-spring formed in the opposite end of the cylinder for controlling the movement of

the piston-valve, and the spring-stop in said end.

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

WILLIAM K. OMICK.

Witnesses:

M. B. O'DOGHERTY,
OTTO F. BARTHEL.