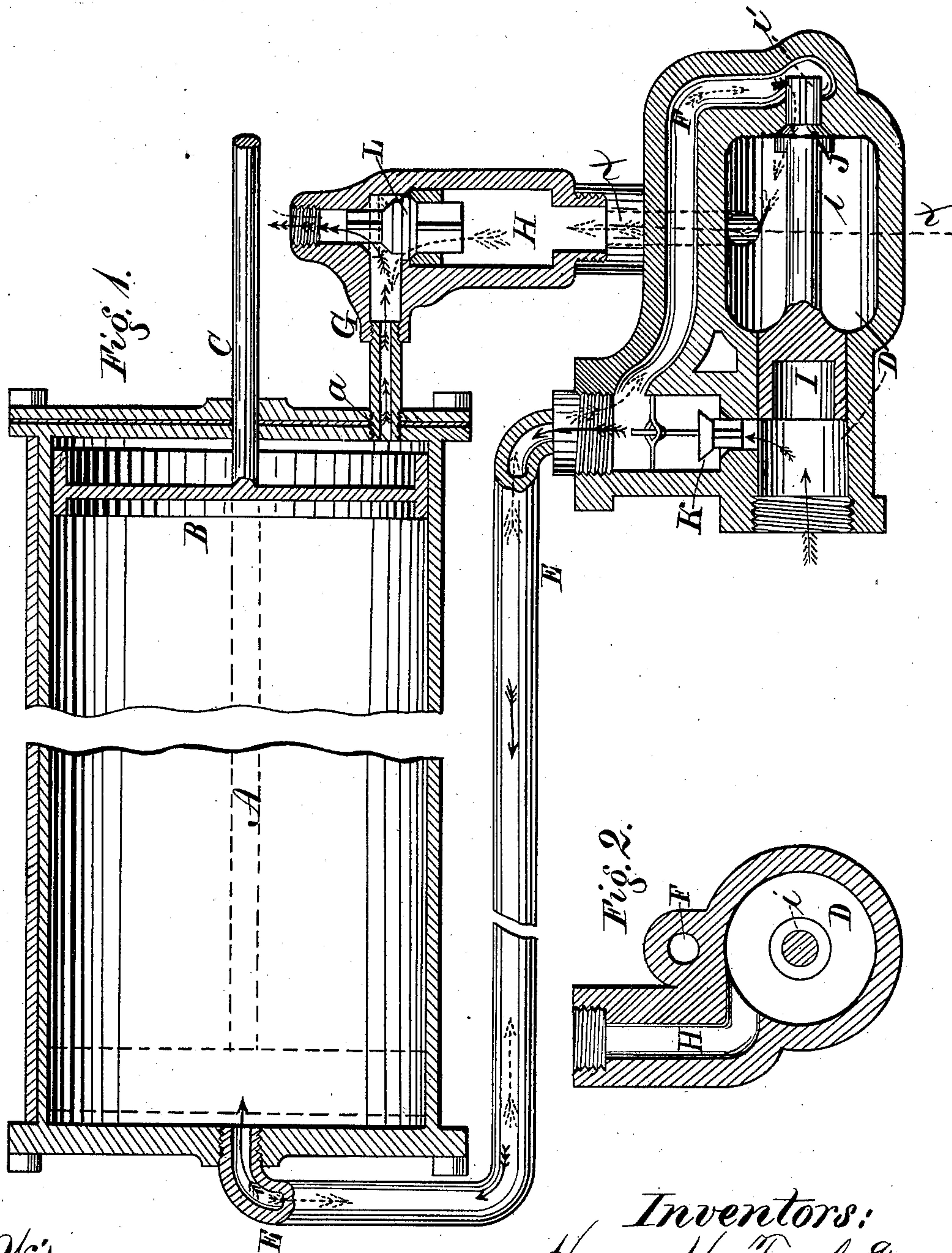


H. H. TAYLOR & A. McCAMISH.

Steam Car-Brake.

No. 167,804.

Patented Sept. 14, 1875.



Witnesses:  
P. R. Richards  
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att'y.



# UNITED STATES PATENT OFFICE.

HORACE H. TAYLOR AND ALBERT McCAMISH, OF BEARDSTOWN, ASSIGNORS  
OF ONE-THIRD THEIR RIGHT TO WILLIAM H. SMITH, OF SAME PLACE;  
SAID TAYLOR, McCAMISH, AND SMITH ASSIGNORS OF ONE-FOURTH IN-  
TEREST TO ROBERT O. LOOSLEY, OF ROCK ISLAND, ILLINOIS.

## IMPROVEMENT IN STEAM CAR-BRAKES.

Specification forming part of Letters Patent No. **167,804**, dated September 14, 1875; application filed  
August 30, 1875.

*To all whom it may concern:*

Be it known that we, HORACE H. TAYLOR and ALBERT McCAMISH, of Beardstown, county of Cass and State of Illinois, have invented certain new and useful Improvements in Steam-Actuated Car-Brakes, of which the following is a specification:

Our invention relates to that class of car-brakes in which steam is conducted back to a brake-operating cylinder beneath each car by a pipe from the engine, but more especially to that class of brakes in which air compressed by steam-power is led by one or more pipes to brake-operating cylinders below each car of the train.

In actuating-brakes of this description the pressure which sets the brakes, having performed its function, is either released by means of an escape at or near the engine or supply-tank by a counter-flow from the brake-operating cylinder which relieves the brakes, the steam or air being educted through the conducting-pipe, and not escaping until it reaches the said escape, or an escape or eduction is arranged between the conducting-pipe and the brake-operating cylinder, in such manner as to allow the air or steam to pass back from the brake-operating cylinder, and escape from the end of said cylinder at which it entered, directly through a pipe, without passing back to the escape at the engine.

The object of our invention is to allow the steam or air, after it has been used, to force the piston in the brake-operating cylinders to one of its ends, to have free communication with the other end of said brake-operating cylinder, and establish an equilibrium of pressure on the piston, in order to relieve the brakes immediately or more effectually, and to prevent dust or débris from being drawn into the brake-operating cylinder; a further object being to allow the air, after having been utilized in both ends of the brake-operating cylinder, to escape through the opening in the cylinder-head usually provided for the escape of the air before the advancing piston-head; and our invention consists in providing com-

munication between the ends of the brake-operating cylinder, for the purpose of allowing the passage of the air from one end of said cylinder to the other, to produce an equilibrium of pressure on each side of the piston when it is desired to release the brakes; and it also consists in an arrangement of valves and pipes to operate in connection with said communication, so that the brakes may be alternately set and released.

Figure 1 is a vertical sectional view of a device embodying our invention, and Fig. 2 is a detached sectional view of that part of Fig. 1 cut by the line *x x*.

A is the brake-operating cylinder; B, the piston, and C the piston-rod, constructed in the usual manner for transmitting the power of the compressed air in the cylinder A to the car-brakes. *a* is the usual opening in the cylinder A, to allow the air to escape as the piston B is driven forward to apply the brakes. D is a short pipe, to the left-hand end of which is attached one end of the branch-pipe, which leads to the main conducting-pipe from the engine. One end of the pipe D may be enlarged, as shown in the drawings. E is a pipe leading from one end of the pipe D to one end of the cylinder A, and connects their interiors. F is a pipe connecting the interior of the pipe E with the enlarged end of the pipe D. G is a pipe extending outward from the usual relief-opening *a* in the cylinder A. H is a pipe connecting the interior of the enlarged end of the pipe D with the interior of the pipe G. I is a piston-valve fitting accurately the contracted end of the pipe D, and has a stem, *i*, which carries a valve, J, seated in the end of the pipe F, and provided also with wing-guides *i'*, or any other suitable guides. K is a valve seated in the pipe E, between its entrance to the pipe D and the entrance to the pipe F. L is a double valve seated at its upper end in the pipe G, and at its lower end in the pipe H.

The operation of our invention is as follows: By means of any ordinary devices the compressed air or steam is allowed to pass from



its containing-reservoir through the main pipe and branch pipe to the end of the pipe D, entering which, as shown by the single-headed arrows, it will drive the piston I to the right, as shown by full lines, thus closing the opening to the pipe F, where the valve J seats by the operation, and opening at the same time communication to the pipe E by raising the valve K, passes through said pipe E to the cylinder A, and driving the piston B to the position shown by full lines, thus projects the rod C, which is connected with the brake-levers, and by said movement operates them. The air in front of the advancing piston B, during said forward movement thereof, passes freely out through the ordinary relief-opening *a*, the valve L being in position shown in the drawings, and allowing its passage through the pipe G, as shown by the double-headed arrows. The surface of the valve I, on which the air impinges in front, being larger than the rear surface of the valve J, will hold the valves J I in the positions described until the moment that the pressure at the engine or tank is cut off, and the back pressure or flow commences, when the valve K will drop to its seat, and the valves I J, moving to the left from the pressure of air returning through pipes E and F to the position shown by dotted lines, will close the direct opening from pipe E to the contracted end of the pipe D, and open the communication from the pipe F to the enlarged end of the pipe D, and thence to the pipe H, passing up which the air will raise the valve L, as shown by dotted lines, and allow the air to pass through the pipe G into the cylinder A, thus establishing uninterrupted communication between the interior ends of the cylinder A, as shown by the dotted-line arrows, and thus equalizing the pressure of the air on both sides of the piston B, which will then slide back to the position shown by dotted lines—its normal position—and release the brakes on

each and every car simultaneously. While the piston B is moving to the left, and the air passing through the pipe H, the valve L will be held up and allow its passage, but when the piston stops at the end of its stroke, the pressure on the upper and lower sides of the valve L will then be equal, and it will by gravity drop to the position shown by full lines, and allow the compressed air in the cylinder A to escape through the pipe G. The air which enters the cylinder A at the opening *a*, as the piston slides back to its normal position, is the air from the reservoir at the engine, clean and free from the dust and grit which is always more or less commingled with the air beneath the cars, and which is drawn into the cylinders through the openings *a* or others in the ordinary brake-operating cylinders, as the piston returns, and which soon wears the piston and cylinder, and necessitates frequent removal of the same for cleaning.

We claim as new and desire to secure by Letters Patent—

The combination, with the cylinder of a steam or air actuated car-brake, of supply-pipes at each end of said cylinder, and automatically-operating valves, constructed and arranged substantially as described, whereby decrease of pressure within the main supply-pipe operates to automatically supply air from one side of the piston to the opposite side of the same, thereby equalizing the pressure upon the piston, and allowing it to return to its normal position at a slight expense of power, substantially as and for the purpose set forth.

In testimony that we claim the foregoing as our invention we have hereunto set our hands this 23d day of June, 1875.

HORACE H. TAYLOR.

ALBERT McCAMISH.

In presence of—

THOMAS MCKEE,

P. R. RICHARDS.