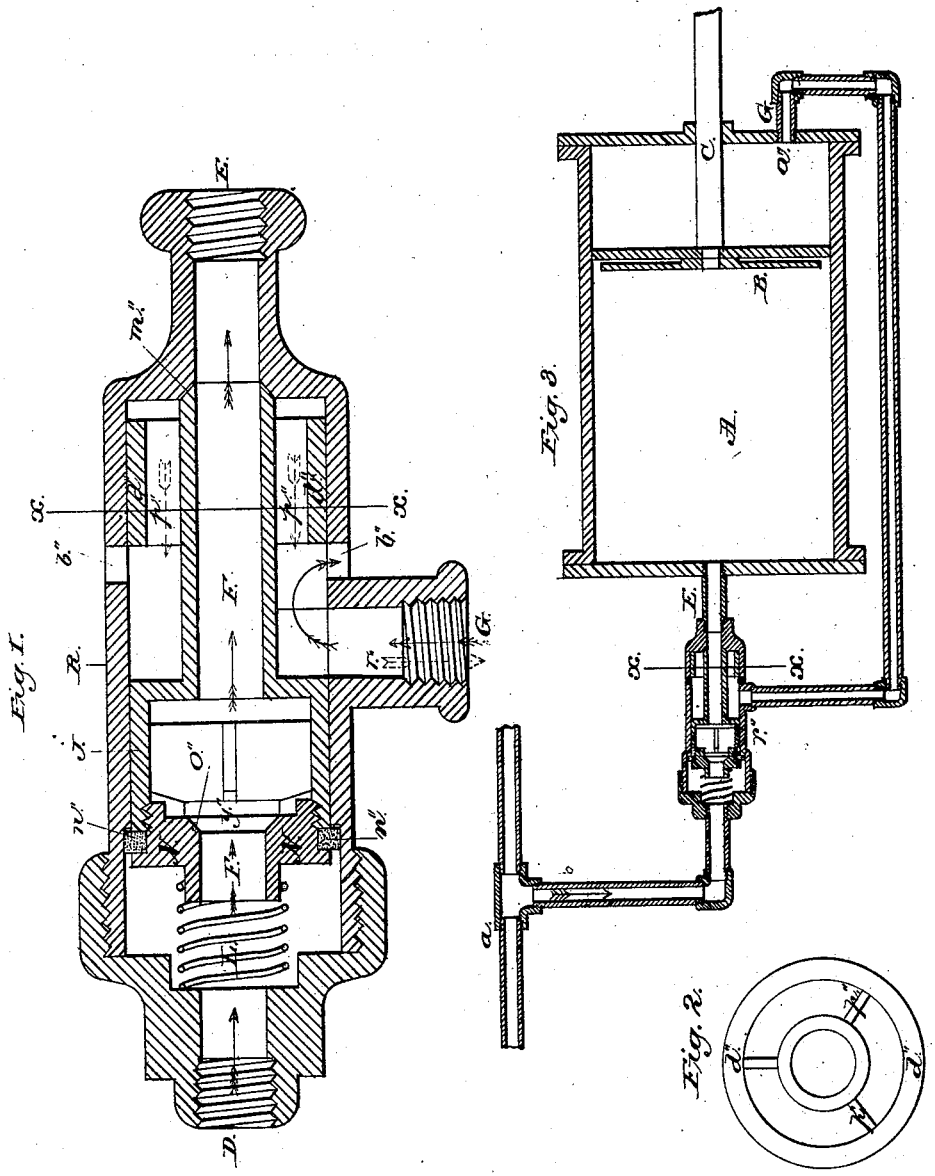
H. H. TAYLOR & A. McCAMISH.

STEAM AND AIR-BRAKE.

No. 189,147. Patented April 3, 1877.



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UNITED STATES PATENT OFFICE.

HORACE H. TAYLOR, OF WARSAW, AND ALBERT McCAMISH, OF EAST ST. LOUIS, ILLINOIS, ASSIGNORS TO JOHN F. DEGNON, OF ST. LOUIS, MISSOURI, AND C. D. LEET, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN STEAM AND AIR BRAKES.

Specification forming part of Letters Patent No. **189,147**, dated April 3, 1877; application filed August 11, 1876.

To all whom it may concern:

Be it known that we, HORACE H. TAYLOR, of Warsaw, county of Hancock, and State of Illinois, and ALBERT MCCAMISH, of East St. Louis, county of St. Clair, 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, and escapes 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 cylinder to one of its ends, to have free communication with the other end of said brake-operating cylinder, passing back to the escape at the engine, 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.

Figure 1 is a vertical sectional view of a device embodying our invention. Fig. 2 is a transverse view of Fig. 1 at *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 of the cylinder A, to allow the air to escape as the piston B is driven forward to apply the brakes. D is an opening, to left-hand end of which is attached one end of the branch pipe, which leads to conducting-pipe from the engine. E is a pipe leading from one end of the valve-case to front end of cylinder A, and connects their interiors. G is a pipe, extending outward from the usual relief-opening *a''* in the cylinder A, and connecting with our improvement at *r''*. J is a hollow piston-valve, fitting accurately the valve-seat *m''*. F is an opening in hollow piston-valve, for the transmission of air from branch pipe D to conducting-pipe E, and so on into cylinder A. *y''* is wing-valve in hollow piston-valve, with valve-seat at *o''* in plug *n*. L is a spiral spring, holding hollow piston-valve J in position, as shown in drawing. *n''* is a leather packing-ring, to exclude the air from passing between the hollow piston-valve and case R, and held in position by plug *n*. *d''* is a slide-valve, held in position by wings *p''*, as shown in detached sectional view No. 2. *b''* are exhaust-ports in case R, whereby the air escapes from back end of cylinder A through the pipe G, when the air is applied at D.

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 *a a* and branch pipe, to the opening D, entering which, as shown by the single-headed arrows, it will pass through the hollow piston-valve J to the right, as shown by full lines, and, entering the opening to the pipe E to the cylinder A, and driving the piston B to the position shown by full lines, thus projects the piston-rod C, which is connected with the brake-levers, and by said movement operates them. The air in front of advancing piston B, during said forward movement thereof, passes freely out through the pipe G, and escapes at exhaust-ports *b''*, as shown by double-headed arrows, the hollow piston-valve J remaining in position, as shown in drawing, until the moment the pressure at the engine is cut off and the back pressure or flow commences; then the air-pressure in the cylinder

A returns through pipe E and into hollow piston-valve J, closing valve y'', and pressing hollow piston-valve J back to the left, the slide-valve d closing the exhaust-ports f'', allowing the air to pass around the end of valve m'' and between wings p'', as shown by dotted arrows, and passes through pipe G into back end of cylinder A, thus establishing uninterrupted communication between the interior ends of cylinder A, as shown by the dotted-line arrows, and thus equalizing the pressure of the air on both sides of the piston.

We do not claim, broadly, a hollow piston-valve with a supplemental valve working therein.

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

The combination of the valve case or shell R, with its eduction-ports b'' b''; the hollow piston-valve J, constructed with valve-shaped end, made to fit its seat m'', and moved thereto by the current of compressed air, and which carries in its interior a wing-valve, seating itself by moving in the opposite direction, said piston-valve J being also constructed with the slide-valve or ring-bearing d'' d'', with air-passages through it between the arms p'' p'', Fig. 1; the wing-valve y'', and the pipe-connections from G, Fig. 1, to the brake-cylinder, whereby the air-pressure in the brake-cylinder is equalized each side of piston B, substantially as and for the purpose set forth.

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Witnesses:
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