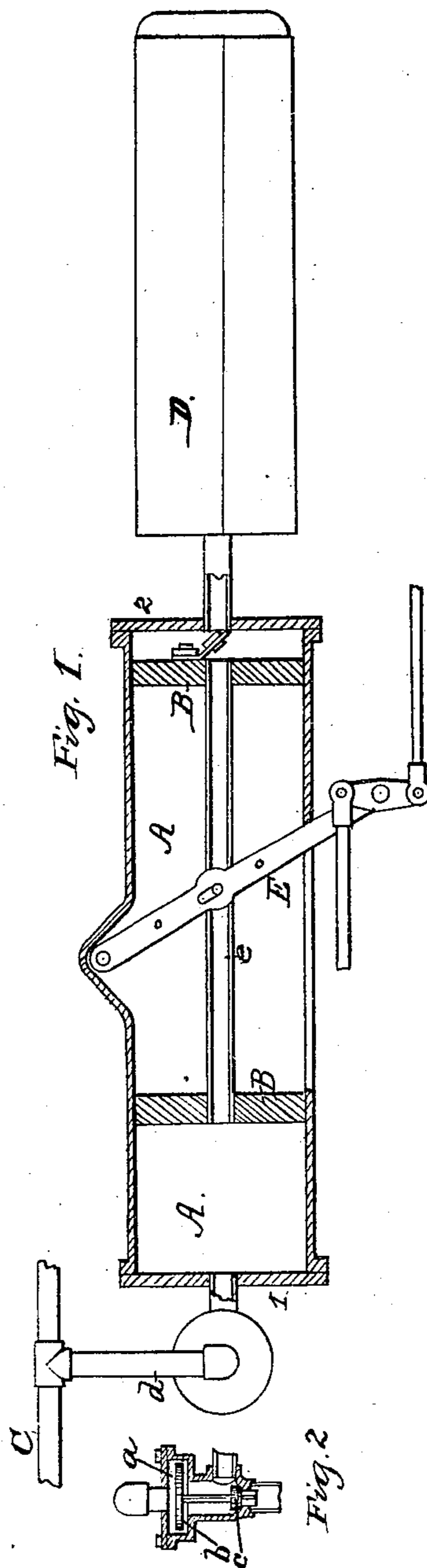


(No Model.)

F. W. EAMES.
Air Brake Apparatus.

No. 241,323.

Patented May 10, 1881.



Attest:
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UNITED STATES PATENT OFFICE.

FREDERICK W. EAMES, OF WATERTOWN, NEW YORK.

AIR-BRAKE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 241,323, dated May 10, 1881.

Application filed October 20, 1880. (No model.) Patented in England February 15, 1879.

To all whom it may concern :

Be it known that I, FREDERICK W. EAMES, a citizen of the United States, residing at Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Air-Brake Apparatus, (Case A;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification, said invention having been patented to me by the government of Great Britain on the 15th day of February, A. D. 1879, and numbered 616.

My invention relates to cylinders and their pistons employed in a brake apparatus, which operate the brake-levers that apply the brakes to the train.

My present improvement consists of a cylinder in which compressed air is kept on both sides of one or more pistons, and which piston is operated by discharging the air from one side only of the piston or pistons.

It also consists in combining with a piston of the above description a storing or auxiliary reservoir and a valve device for the discharge of air from one side of the piston or pistons directly to the outer air.

Figure 1 represents a central vertical section and partial elevation of a device to which my improvements have been applied. Fig. 2 represents a sectional view of the discharge-valve for the cylinder located in the brake-pipe.

In the accompanying drawings, in which the same letters of reference indicate the same parts, A represents a horizontal cylinder, fitted with a floating double piston, B B, having a hollow rod, *e*, closed at one end by a clack-valve. The end 1 of this cylinder is connected with the brake-pipe C by means of a branch pipe, *d*, and the end 2 with an air-reservoir, D, by which means a balance of compressed air is supplied to the opposite heads of the floating piston.

Connected with the piston-rod is a rock-lever, E, which is pivoted to a bearing in the cylinder, and is connected at its outer end to the brake-levers.

To quicken the action of the apparatus I provide the branch pipe *d*, leading to the cylinder from the brake-pipe C, with a shallow circular chamber, *a*, in which is fitted loosely a piston, *b*. Pendent from this piston is a valve, *c*, which rests on a valve-seat in the brake-pipe, below the connection with cylinder A.

The operation is as follows: When air is discharged at the end 1 of the cylinder the piston B B will be forced in that direction by the compressed air supplied from the reservoir D, and which gives motion to the rock-lever E, thereby setting the brakes in action. This discharge of air takes place whenever, from any cause, there is a reduction of pressure in the brake-pipe C. So soon, however, as the balance of pressure is restored in the cylinder A the brakes will be taken off, and will remain out of action until the balance is again destroyed.

The operation of the valvular apparatus for opening communication from the end 1 of the cylinder and the external air is as follows: The loosely-fitting piston *b* allows air to pass it slowly into the cylinder A; but any sudden discharge of air above the piston *b* carries the piston up and opens the valve *c*, attached thereto, and thus allows the air in the cylinders instantly to escape below the valve to the outer air. This escape of air from the front of the floating piston B B will permit the air at the back of the piston to apply the brakes, as before explained. For releasing the brakes compressed air is again supplied to the end 1 of the cylinder A, in doing which the valve *c* is forced onto its seat and communication with the external air cut off.

The apparatus admits also of being worked in the following manner: The air from one side of the piston may be exhausted, and a counterbalancing partial vacuum may be formed on the other side of the piston by a jet of compressed air or steam.

By fitting the valve of the piston B B so as to operate in a direction opposite to that shown in Fig. 1 of the drawings, and dispensing with the valve and piston in the branch pipe *d*, or substituting therefor a valve adapted to work in connection with a vacuum-brake system, such as has heretofore been patented to me, my present invention could be used in connection

with a system of brake apparatus in which a vacuum is maintained on both sides of the piston to keep the brakes off, and said brakes set in action by destroying the vacuum on one
5 side of the piston only.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

10 1. In an air-brake apparatus, a cylinder in which a pressure is maintained on both sides of the double piston B, provided with a valve, the piston-rod having attached thereto, between the pistons, a reciprocating lever, substantially as and for the purpose set forth.

15 2. In an air-brake apparatus, the combination, with a cylinder in which a pressure is maintained on both sides of the double piston, the latter being provided with a valve, and the piston-rod having attached thereto a reciprocating lever, of the reservoir D, substantially as set forth.

20 3. In an air-brake apparatus, the combination, with cylinder A, having double piston B, provided with a valve, of the rock-lever E,

reservoir D, loosely-fitting piston *b*, and valve *c*, substantially as set forth. 25

4. In an air-brake apparatus, the combination, with cylinder A, having double piston B, provided with a valve, of the rock-lever E, loosely-fitting piston *b*, and valve *c*, substantially as set forth. 30

5. In an air-brake apparatus, the combination of the piston *b*, valve *c*, and double piston B, for discharging air from the cylinder upon reduction of pressure in the brake-pipe, substantially as described. 35

6. In an air-brake apparatus, a cylinder in which a pressure is maintained on both sides of the double piston B, the latter being provided with a hollow piston-rod and valve and with a reciprocating lever, substantially as and for the purpose set forth. 40

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

FRED. W. EAMES.

Witnesses:

CHAS. D. BINGHAM,
E. D. EAMES.