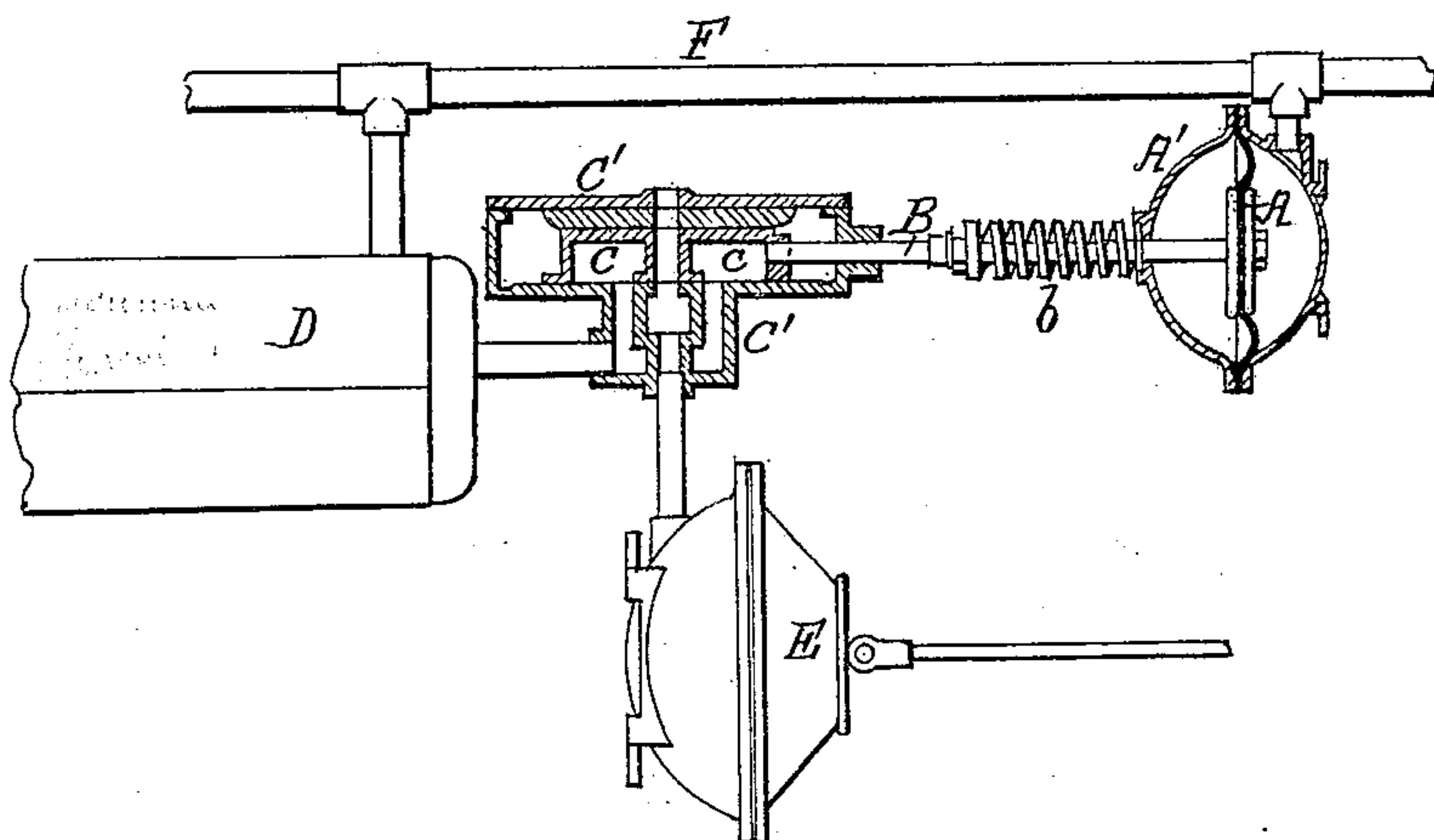


(No Model.)

F. W. EAMES.  
Vacuum Brake Apparatus.

No. 241,326.

Patented May 10, 1881.



Attest:

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Inventor:

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# UNITED STATES PATENT OFFICE.

FREDERICK W. EAMES, OF WATERTOWN, NEW YORK.

## VACUUM-BRAKE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 241,326, 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 Vacuum-Brake Apparatus, (Case D;) 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 drawing, and to letters or figures of reference marked thereon, which forms a part of this specification, said invention having been patented to me by the government of Great Britain on the 15th day of February, 1879, No. 616.

The drawing represents a partial vertical section and side elevation of a device embodying my present improvements.

The invention relates to brake apparatus for fluid-pressure brakes; and it consists in providing the brake-pipe leading to the operating cylinder or vessel with a balanced slide-valve, which, when in its normal position, establishes communication between said cylinder and the open air, said slide-valve being kept in this condition by a regulated amount of vacuum-power, and which holds off the brakes, and also to provide that when this power is exceeded or destroyed the brakes shall be applied. This construction and arrangement also results in an instantaneous application of the brakes upon the accidental severance of the train.

In the drawing, A represents a flexible diaphragm or equivalent, arranged within an airtight vessel, A', which communicates with the main brake-pipe F.

To the diaphragm A, by suitable clamp-plates, is secured a valve-rod, B, attached to the valve C, to give motion thereto. The valve C is incased in a valve-box, C', in direct communication with a vacuum-chamber, D, and with a collapsible vessel, E, which is used to apply the brakes. The valve C has three ways. Two of these ways serve to cover ports or passages leading from the vacuum-chamber D, and the third and intermediate way will keep open a passage which leads from the open air to the

collapsible vessel E, which actuates the brakes. When employing this valve and diaphragm in connection with a brake apparatus, it will be understood that a certain regulated amount of vacuum-power will be maintained in the brake-pipes, sufficient to keep the central way of the valve concentric with the opening leading to the operating cylinder or vessel E against the pressure of the spring b, surrounding the valve-rod B.

Whenever from any cause, such as the accidental severance of the train, destruction of the vacuum in the brake-pipe, or by increasing the vacuum beyond the stated regulated amount, the valve-rod B, by reason of a corresponding movement of the diaphragm A, is moved either backward or forward, according as the vacuum is increased or diminished beyond the regulated amount, the external air-passage will be closed and the vacuum in the reserve-chamber will be brought into communication with the collapsible vessel E, and thus cause the instant application of the brakes. This valve-rod or equivalent may be used to work a four-way cock, and for the like purpose.

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

1. A valve and diaphragm or piston so constructed and arranged that the application of the brakes will result whenever the pressure is increased or diminished beyond a regulated amount, substantially as set forth.

2. The combination of diaphragm or piston A, valve C, valve-box C', and operating-chamber E, substantially as set forth.

3. The combination of diaphragm or piston A, valve C, and its valve-casing C', constructed substantially as set forth.

4. The combination of diaphragm or piston A, valve C, valve-box C', chamber D, and operating-chamber E, substantially as set forth.

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

FRED. W. EAMES.

Witnesses:

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