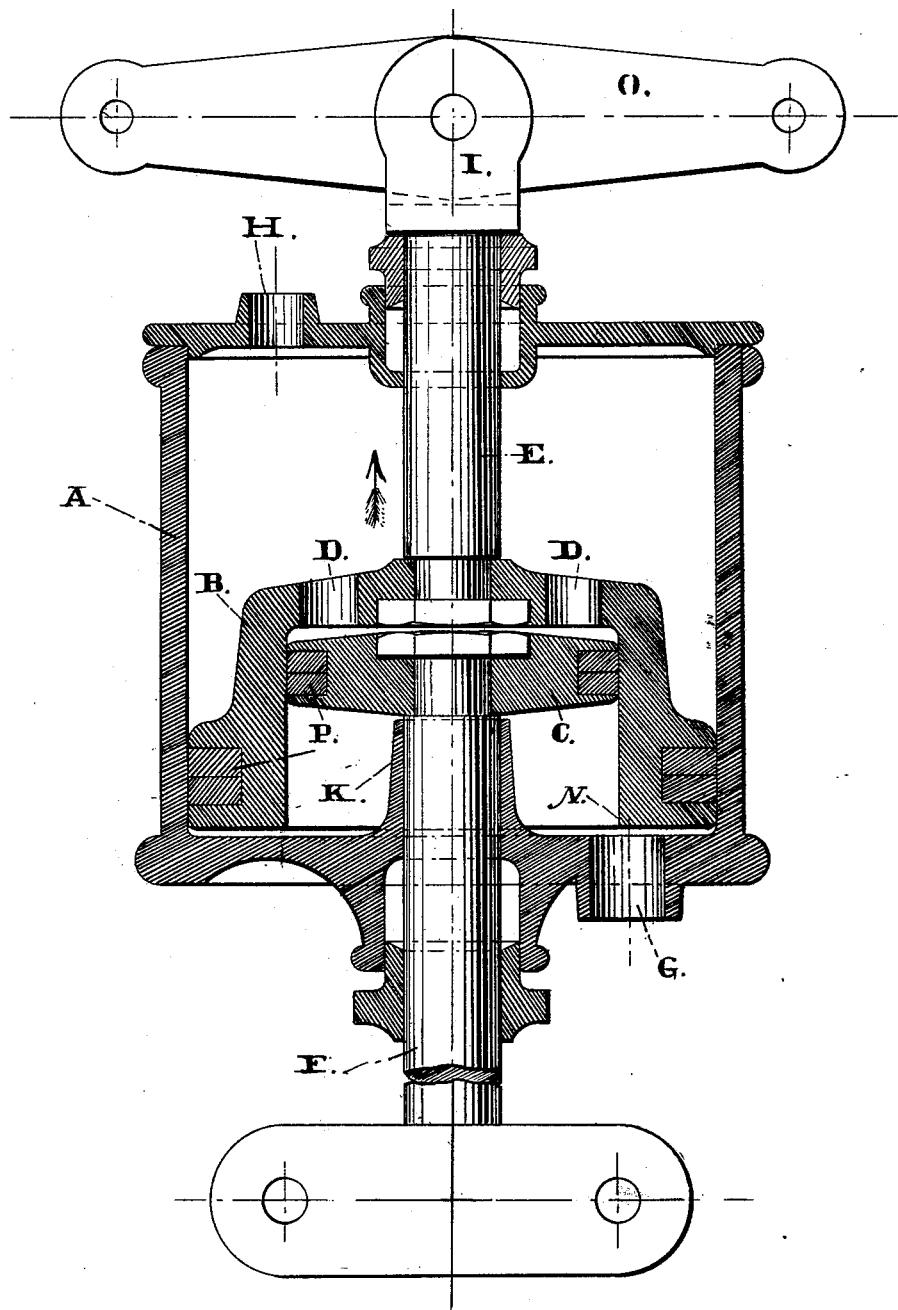


H. I. BEARUP.
Steam or Air Brake Cylinder.

No. 221,499.

Patented Nov. 11, 1879.



Witnesses;
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Inventor;
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UNITED STATES PATENT OFFICE.

HENRY I. BEARUP, OF ELKHART, INDIANA, ASSIGNOR OF ONE-THIRD OF HIS RIGHT TO CHARLES G. MELCHER, OF SAME PLACE.

IMPROVEMENT IN STEAM OR AIR BRAKE CYLINDERS.

Specification forming part of Letters Patent No. 221,499, dated November 11, 1879; application filed March 19, 1879.

To all whom it may concern:

Be it known that I, HENRY I. BEARUP, of Elkhart, in the county of Elkhart and in the State of Indiana, have invented certain new and useful Improvements in Steam or Air Brake Cylinders for Locomotive Driving and Tender Wheels; and I do hereby declare the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to steam or air brake cylinders for locomotive driving-wheel and tender brakes.

Heretofore such cylinders have been used for the applying of the braking-power upon the tender-wheels simultaneously with the applying of the power upon the driving-wheels by means of connecting their respective braking mechanism to a single piston. This method is objectionable, for the reason that in connecting the driver and tender-wheel braking mechanism to a single piston they cannot be adjusted so as to equally distribute the power upon all wheels. The second reason is in the event the driver-brake becomes inoperative it also destroys the efficiency of the tender-brake. The result of this arrangement and method is that the efficiency is greatly diminished.

The object of my invention is to arrange a steam or air brake cylinder in such a manner that the driving-wheel and tender brakes can be simultaneously applied and automatically adjusted by being operated by means of connecting the respective braking mechanism to separate independent pistons working in the same cylinder and actuated by the same pressure, thereby distributing the power equally upon all wheels, and in the event one becomes inoperative it cannot affect the efficiency of the other.

This invention consist, first, in the operating of locomotive driving-wheel and tender-wheel brakes by connecting their respective braking mechanism to separate or independent pistons working in the same cylinder and actuated by the same pressure.

It also consists in the arrangement of two pistons within one cylinder in such a manner

that they will be simultaneous acting and automatically adjusting.

It finally consists in the construction and arrangement of two pistons within one cylinder, which will be more fully hereinafter explained.

In the drawing hereto annexed, the figure represents a central vertical section of my improved steam or air brake cylinder.

A represents the ordinary steam or air brake cylinder, provided with two separate or independent pistons, B and C, of unequal diameters. The largest piston, B, is of an elongated cylindrical form, as shown, and made to fit the interior of the cylinder A. Its periphery is provided with packing or packing-rings, in the usual or suitable manner. Said piston B is cast with the central elongated cylindrical recess or chamber, N, bored out to receive the small piston C, which is of the ordinary type in all respects.

The piston B is provided with suitable openings D, which serve a threefold purpose: First, to relieve all counter-pressure between the two pistons B and C; second, in case the pressure-area of the outer piston, B, requires to be enlarged without enlarging the diameter, it can be inverted, and in such a case the openings serve as pressure-passages to admit the pressure to actuate the smaller piston C; third, when the pistons are operated in the positions shown, the openings D in piston B serve to admit the atmospheric pressure to piston C in assisting it in its downward stroke, as the downward stroke is controlled by gravity, assisted by springs or other suitable means, if desired.

The piston B is provided with suitable piston-rod E, which is connected to the usual tender-braking mechanism by means of the lever O, or its equivalent. Piston C has its piston-rod also connected to the driving-wheel-braking mechanism in the usual manner.

As the equilibrium of the two pistons B and C cannot take place simultaneously, the larger or outer piston, B, is allowed the greater upward movement. In case the outer piston, B, is used in the inverted way, the inner or smaller piston, C, should have the greater upward movement.

When the pistons are operated in the man-

ner shown, the cylinder A is provided with the boss K, or its equivalent, extending upward sufficient distance to prevent the piston C from drawing out of the piston B. When the piston B is inverted the said boss can be dispensed with.

G represents the pressure-passage common to all such cylinders, and said passage can be located at the side, if preferred. H represents a passage for the purpose of relieving all counter-pressure occurring from condensation or leakage finding its way above the pistons. Said opening can also be located at any position preferred above the pistons.

The operation is as follows: Supposing the pressure is admitted, both pistons B and C will immediately be caused to ascend in the direction of the arrow. As the pressure produces equilibrium first upon the piston that has the least travel the other continues ascending until the equilibrium is also produced, thereby resulting in the transmission of the same power upon the tender as is received upon the drivers, thus acting simultaneously and adjusting itself automatically.

I am well aware that a single piston has been used for applying locomotive-tender and driving-wheel brakes simultaneously; therefore I do not claim any such arrangement; but I am not aware of any such method and arrangement as herein described, wherein by the construction and arrangement of two separate or independent pistons I can simultaneously apply and automatically adjust the tender-brakes with that of the driving-wheel brakes. Therefore,

What I claim, and desire to secure by Letters Patent, is—

1. A double-acting steam or air brake provided with independent pistons, to which a simultaneous independent movement in one and the same direction will be imparted on the application of pressure, substantially as and for the purpose set forth.

2. The combination of the cylinder A and piston C, the cylindrical elongated piston B, with its periphery provided with packing or packing-rings P, in the usual or suitable manner, central elongated cylindrical chamber or recess, N, and the suitable openings D, and provided with a suitable piston-rod, E, and lever O, substantially as and in the manner specified.

3. In a steam or air brake, the combination of the outer and inner pistons, B C, the outer one recessed, as shown, to form a cylinder for the inner one, as and for the purposes set forth.

4. In a steam or an air brake cylinder that shall be automatically adjusting and simultaneously-acting, cylinder A, the adjusting-pistons B and C, openings D, piston-rods E and F, and the lever O, all combined and arranged in the manner and for the purpose herein described, specified, and shown, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of February, 1879.

HENRY I. BEARUP.

Witnesses:

W. J. WILSON,
JOHN W. CUMMINS.