C. H. PERKINS.

Valve for Air-Brakes.

No. 163,242. Patented May 11, 1875.

Fig. 1.

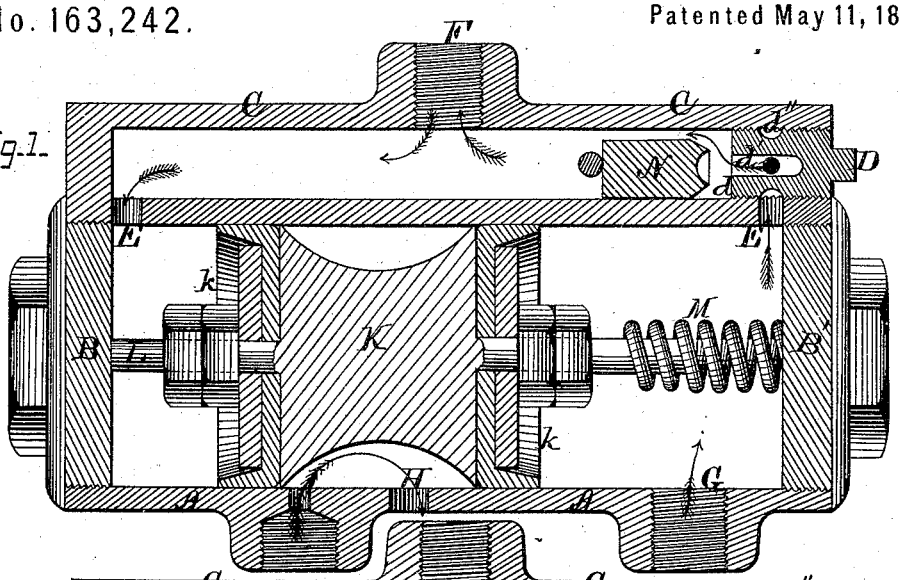


Fig. 2.

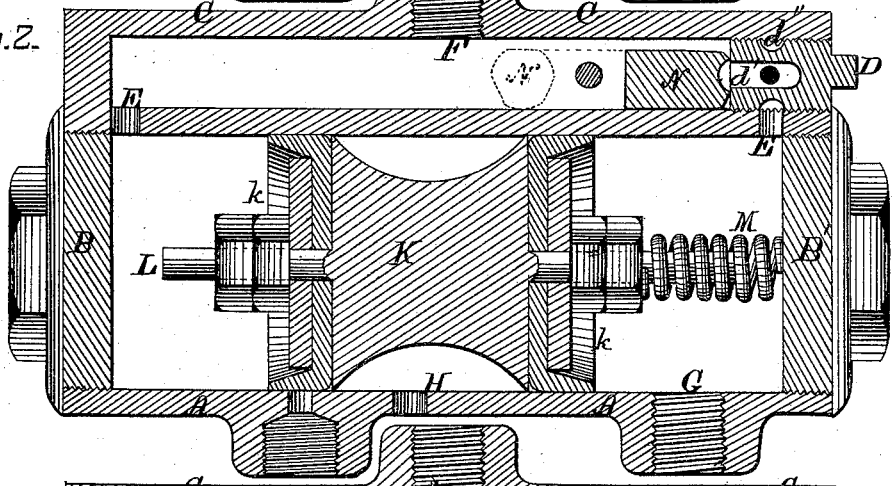
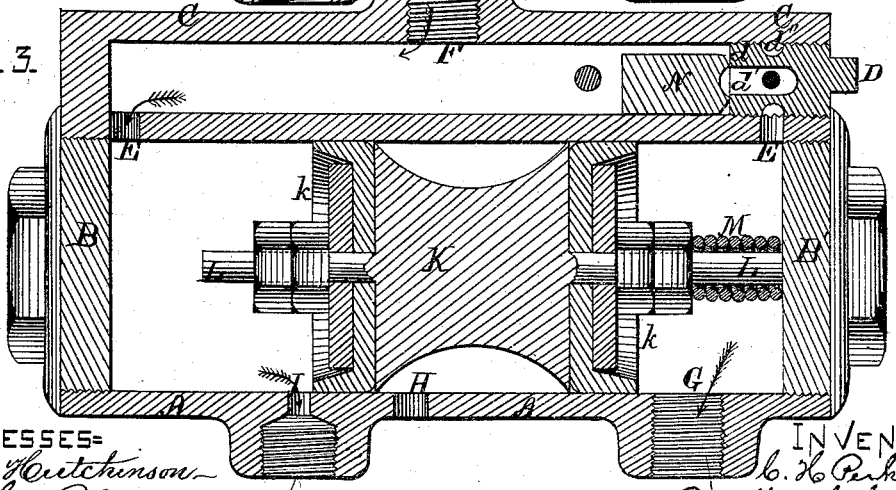


Fig. 3.



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IMPROVEMENT IN VALVES FOR AIR-BRAKES.

Specification forming part of Letters Patent No. **163,242**, dated May 11, 1875; application filed March 13, 1875.

To all whom it may concern:

Be it known that I, C. H. PERKINS, of Bloomington, in the county of McLean and in the State of Illinois, have invented certain new and useful Improvements in Valves for Air-Brakes; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a central longitudinal section of my improved apparatus, showing the relative position of parts before air-pressure is applied. Fig. 2 is a like view of the same after pressure is applied, and while the operative parts are in a state of equilibrium, and Fig. 3 shows the position of said operative parts after such equilibrium has been destroyed and air is passing to the brake-cylinder.

Letters of like name and kind refer to like parts in each of the figures.

The design of my invention is to render more simple and efficient the means employed for controlling the admission of air to the cylinder of pneumatic car-brakes; to which end it consists, principally, in the combination of the piston-valve with the cylindrical valve-box, having its inlet, outlet, and exhaust ports relatively arranged in the manner and for the purpose substantially as is hereinafter specified.

It consists, further, in combining, with one end of said main valve, a spiral spring, for pressing it toward one end of the valve-box, when not otherwise adjusted, by air-pressure, substantially as and for the purpose hereinafter set forth.

In the annexed drawings, A represents the box or casing of my valve, constructed in the form of a hollow cylinder, and having its ends closed by means of removable heads B and B′. Upon the upper side of the cylinder A is formed a second supplemental cylinder, C, which corresponds in length to the same, and has about one-fourth its diameter. One end of said upper cylinder C is permanently closed, while its opposite end is closed by means of a removable screw-plug, D. Small ports E and E′ are provided between the ends of the cylinders A and C, an opening, F, is formed at the upper side and longitudinal center of the latter, while three openings, G, H, and I, respectively, are provided within the lower side of said main cylinder A, as shown, the first of said openings G being located near one end, the second opening H at a point just beyond the longitudinal center of said cylinder, while the third opening I is located at a point about one-third the length of said cylinder from its opposite end. Within the cylinder A is placed a piston-valve, K, which has the form shown; is packed with leather *k* at each end; and is provided with a central rod, L, which extends outward from either end, and, by contact with the heads B and B′, limits the travel of said valve. A spiral spring, M, placed around one end of said rod L, bears against the head B and the end of said valve, and presses the latter to the center, longitudinally of said cylinder, as seen in Fig. 2. Upon the inner end of the plug D, which extends inward beyond the port E, is formed a seat, *d*, which, at its center, is provided with an opening, *d′*, that extends longitudinally into said plug, and then radially outward into a concentric cavity, *d″*, that is formed by grooving said plug. The space *d″* is directly over the port E, so that air passing from the cylinder A through said port can, by means of said space and the opening *d′*, enter the valve-box C. A valve, N, is fitted within the box C, and allowed such longitudinal motion therein as to enable the opening *d′* to be uncovered, as seen in Fig. 1; or, by the seating of said valve, to be closed, as shown by Figs. 2 and 3.

The device is now complete, and being placed beneath a car with the opening G in communication with the air-supply pipe, the opening F in communication with the air-tank, and the opening I in communication with the brake-cylinder, operates as follows: The normal position of parts is, as shown in Fig. 1, the main valve K being thrown beyond the center of its casing A, so as to connect the ports I and H and permit air to escape from the brake-cylinder, which position remains unchanged as air from the pump is admitted through the opening G into said casing, and from the same passes through the port E and passage *d′* into the valve-box C, from the lat-

ter through the opening F into the tanks, and through the port E′ into the opposite end of the main valve-box, the pressure of air upon opposite ends of said valve K being just equal. When it is desired to apply the brake, the pressure within the supply-pipe and front end of the valve-box A is decreased, when the pressure within the opposite end of the latter will move the valve K to the position shown in Fig. 3, so as to uncover the outlet-port I and permit air to pass into the brake-cylinder. When the quantity of air passing into the brake-cylinder has been sufficient to cause the pressure within the rear end of the valve-box A and the tank to nearly equal the pressure within the opposite end of said valve-box, the spring M will force the valve K to the central position shown in Fig. 2, and cover the outlet-port I, so as to prevent the escape of air from the brake-cylinder, and cause the pressure of the brake upon the wheels to be maintained. While the brake is on, and the main valve occupies the position shown in Fig. 2, the pressure within the tank may be gradually increased. If it is desired to apply more power to the brake, the pressure within the supply-pipe is again decreased, when the main valve will be again forced to the position shown in Fig. 3, and air admitted to the brake-cylinder until the pressure upon opposite ends of said valve is equalized as before. To let off the brakes, air-pressure is again applied to the supply-pipe, and through the same to the front end of the main valve-box A, and, when such pressure equals that within the opposite end of the latter, the spring M will force the main valve K in an opposite direction, the port I will be cut off from communication with the air-tank and placed in communication with the exhaust-port H, when the air within the brake-cylinder will escape.

The device described is simple in construction, certain and efficient in operation, and enables the desired work to be performed by use of a smaller number of parts than are usually employed.

Having thus fully set forth the nature and merits of my invention, what I claim as new is—

1. In combination with the valve-box A, provided with the inlet-port G, outlet-port I, and exhaust-port H, and connected through suitable mechanism with an air-pressure tank, the valve K, arranged to move longitudinally within said valve-box, having greater width of bearing than, and capable of covering and uncovering, said outlet-port I, and of connecting the same with said exhaust-port H, substantially as and for the purpose specified.

2. In combination with the valve-box A and valve K, the spring M, placed between one end of said valve-box and said valve, and having such length as to cause said valve to cover the outlet-port whenever the air-pressure upon its ends is equal, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 8th day of March, 1875.

CHARLES H. PERKINS.

Witnessēs:
I. E. EASTMAN,
FRANK. WHITE.