(No Model.)

G. A. AYER.

BLOWER VALVE FOR LOCOMOTIVES.

No. 456,240. Patented July 21, 1891.

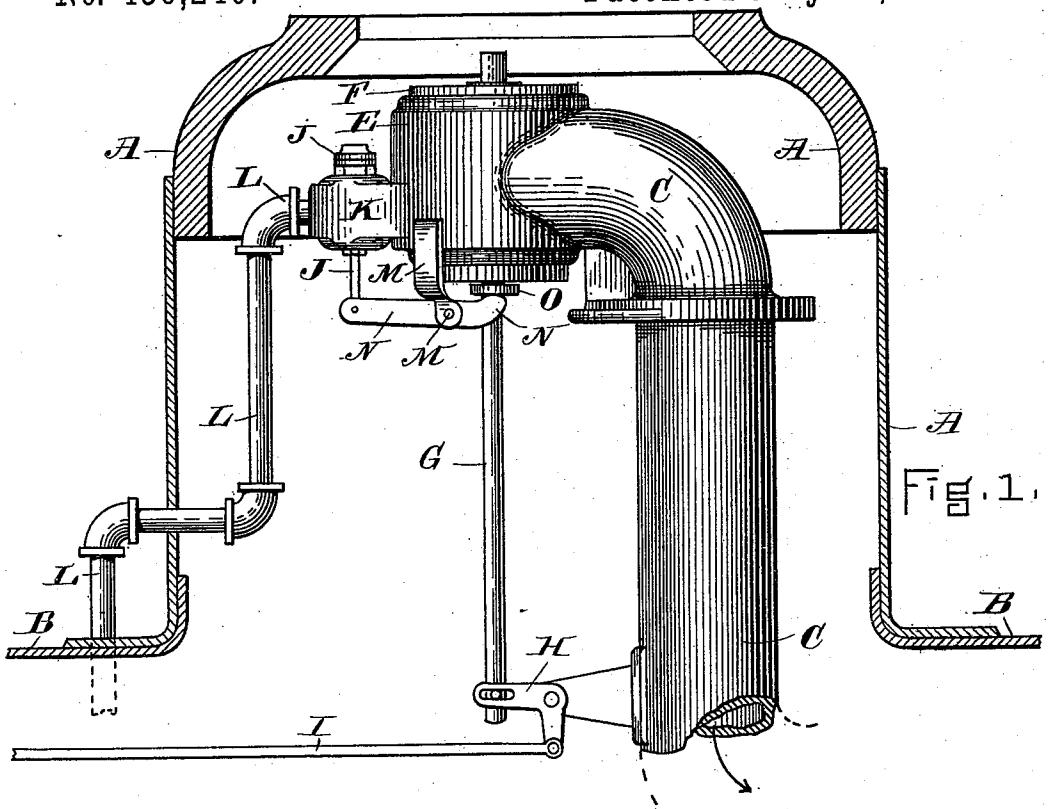


Fig. 1.

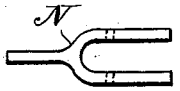


Fig. 3.

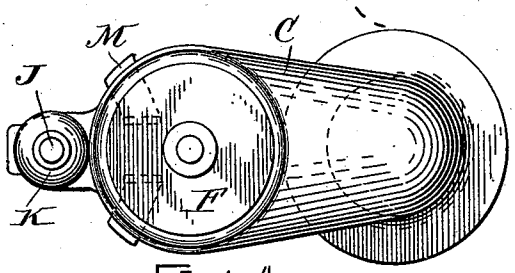
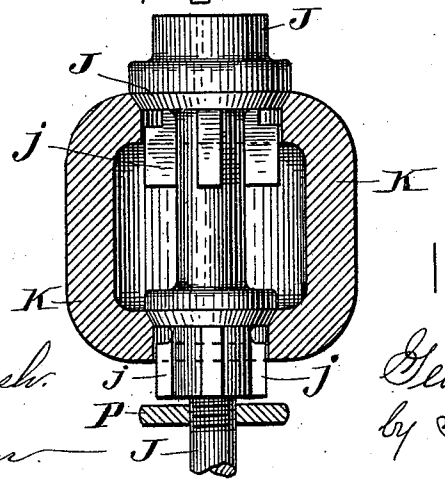


Fig. 2.

Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE A. AYER, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE COMPLETE COMBUSTION COMPANY, OF PORTLAND, MAINE.

BLOWER-VALVE FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 456,240, dated July 21, 1891.

Application filed October 24, 1890. Serial No. 369,218. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. AYER, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Blower-Valves for Locomotive-Engines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention is designed to furnish for locomotive-engines a blower-valve supplementary to the throttle-valve and reversely operated by the same means, so that when the throttle-valve is closed the supplementary or blower valve will by the same movement be opened to give vent for the steam through a pipe leading to the stack to maintain the draft and prevent the flames from bursting into the cab.

My invention is especially valuable in connection with engines having their fire-boxes constructed on the downward-draft principle, as illustrated in my application for patent on "locomotive fire-box" filed simultaneously herewith. With my present improvements the throttle-valve cannot be closed without thereby opening the blower-valve and continuing the artificial draft with such strength as to prevent reversing of the downward course of the caloric current. On the other hand, the opening of the throttle-valve will close the blower-valve so as not to draw off steam unnecessarily when the engine is running, and the draft maintained by means of the exhaust-steam.

My invention consists in a blower-valve and a throttle-valve inclosed in the steam-dome and suitably connected for reverse alternate operation by the same actuating devices.

It also consists in the combination, with the throttle-valve and its operating devices, of a blower-valve with a steam-pipe leading therefrom into the draft-passage, and an operating-lever connecting the stem of said blower-valve with the throttle-valve stem. It also consists in the two valve-casings rigidly united, furnished with the reversely-moving valves and with steam-pipes, and combined with the lever beneath the casings, engaging both valve-stems, and with the actuating throttle-rod.

In the drawings, Figure 1 represents in longitudinal vertical section the steam-dome of a locomotive, and in elevation within the same the dry-steam pipe leading toward the cylinders, and the throttle-valve casing with my improved blower-valve connected thereto and furnished with its steam-pipe running to the draft-passage in the smoke-stack. Fig. 2 is an enlarged top plan of the two valves, and Fig. 3 a plan of the lever which connects their stems. Fig. 4 is a vertical section of the blower-valve casing, drawn full size, with the valve in elevation.

A represents the steam-dome, and B the top of the boiler-shell.

C is the steam-pipe, running from the upper part of the dome A forward to deliver dry steam to the cylinders. (Not shown.)

E is the throttle-valve shell or casing, connected to the upper end of the steam-pipe C, and F the usual balanced throttle-valve, opening by an upward movement and closing by a downward movement of its stem G when the bell-crank lever H and rod I are actuated, as heretofore, by means of the throttle-lever in the cab.

J represents the blower-valve, opening and closing by a vertical movement within its casing K, which is preferably cast integral with the casing E of the throttle-valve, but may be flanged and bolted thereto or otherwise secured in proper relation to the throttle-valve. L is a steam-pipe screwed into this valve-casing K and running thence to the base of the smoke-stack, (not shown,) where the steam-jet through said pipe promotes and maintains the draft when the valve J is open, which occurs with my invention whenever the throttle-valve is closed.

A simple and effective means of my invention of connecting the two valves for alternate action is shown in the drawings. Lugs M, projecting downwardly from the casing E, are connected by a bolt M′, forming a fulcrum for a lever N, which is forked at one end to bestride the stem G of the throttle-valve below a collar O, while the other end of this lever N bears against the lower end of the stem J of the blower-valve, as will be clear from Figs. 1 and 3. A transverse pin P through the stem J comes in contact with the under side of the casing K, as in Fig. 1, when the

blower-valve is properly opened, thus forming a stop at the proper limiting-point. In Fig. 4 the valve J is closed and the stop-pin P is at a suitable distance below the casing K.

The internal construction of the valve J and casing K correspond with the like parts of the throttle-valve. The valve has a seat at top and bottom of its casing, and its body is grooved vertically or formed with radial ribs *j*, between which the steam enters when the valve is lifted by the lever N beneath its stem J. It closes by gravity.

I claim as my invention—

1. The throttle-valve E F and blower-valve J K, combined with the steam dome and pipes and suitably connected for alternate discharge of steam, substantially as and for the purpose set forth.

2. The throttle-valve, with its actuating devices and steam-pipe C, in combination with the blower-valve and steam-pipe L, leading thence to the draft or stack and with the pivoted lever N, connecting the stems of said valves for simultaneous reverse movement by the throttle-lever, for the purpose set forth.

3. The valve-casings E and K, rigidly united to each other within the steam-dome A, in combination with the valves F and J, working within said casings, the steam-pipes C and L, leading therefrom, the lever N, pivoted beneath the casings and engaging the stems of both valves, and the throttle-rod I, serving to actuate them both reversely, for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 25th day of September, A. D. 1890.

GEORGE A. AYER.

Witnesses:
GEORGE W. NORTON,
JOHN B. KELVE.