J. C. LINNELL.
Exhaust-Pipe.

No. 212,611. Patented Feb. 25, 1879.

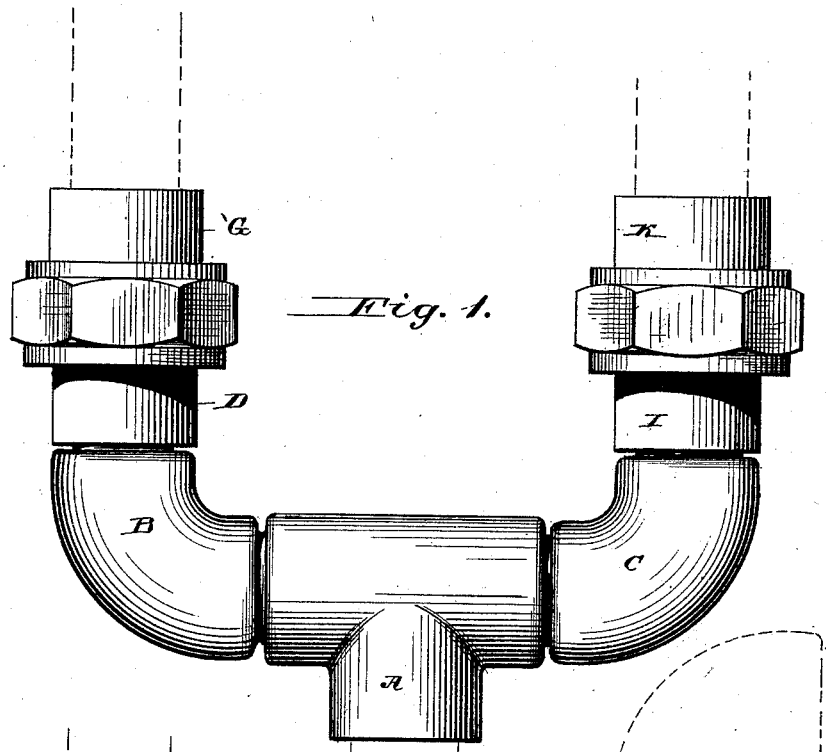

Fig. 1.

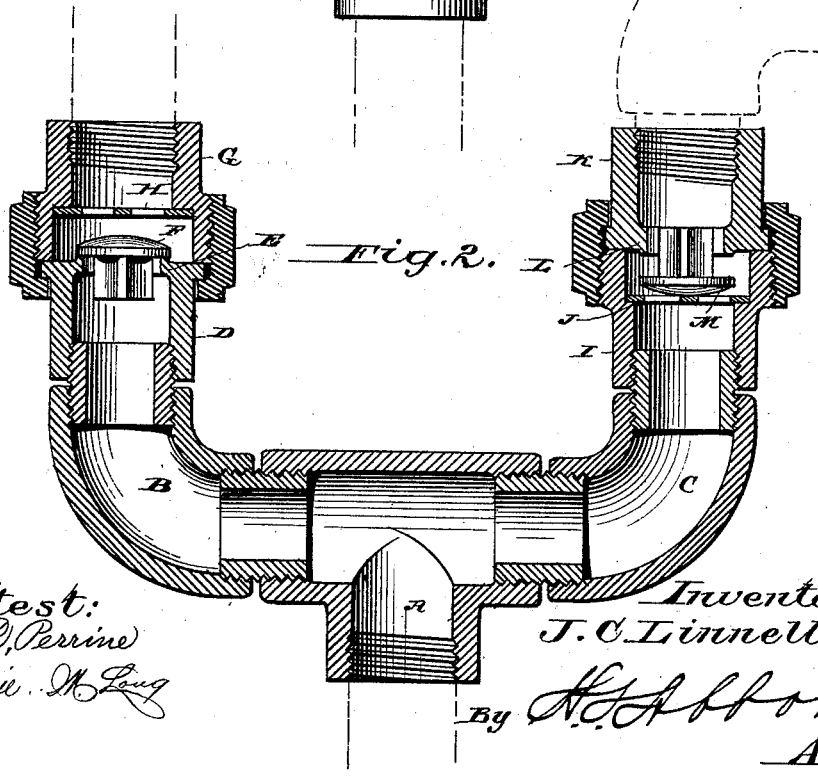

Fig. 2.

Attest:
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UNITED STATES PATENT OFFICE.

JAMES C. LINNELL, OF ADRIAN, MICHIGAN.

IMPROVEMENT IN EXHAUST-PIPES.

Specification forming part of Letters Patent No. **212,611**, dated February 25, 1879; application filed August 12, 1878.

To all whom it may concern:

Be it known that I, JAMES C. LINNELL, of Adrian, in the county of Lenawee and State of Michigan, have invented certain new and useful Improvements in Exhaust-Pipes; and I do hereby declare that the following is a full, clear, and exact description thereof.

This invention relates to certain improvements in exhaust-pipes for steam-engines; and the invention consists in an exhaust-pipe having two automatic valves working in opposite directions, which will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a front view, and Fig. 2 is a central vertical section through the valves and pipe.

In the drawings, A denotes the pipe extending from the cylinder. This pipe A is provided, at its upper end, with branches B and C, as shown in drawings. The branch B is provided with a section of pipe, D, the upper end of which is formed with a valve-seat, E, to support the valve F, as shown in Fig. 2 of drawings.

The lower end of the extension-pipe G is provided with a perforated guard, H, which holds the valve in place. To the branch C is connected a section, I, having its upper end provided with a perforated guard, J, as shown in Fig. 2 of drawings.

To the section I is connected a pipe, K, which extends to the condenser. The end of this pipe K connected with the section I is provided with a valve-seat, L, to receive the steam of the valve M, as shown in Fig. 2 of drawings.

The operation is as follows: The greatest force of exhaust-steam from the cylinder closes the valve M and opens the valve F, thereby allowing the steam to pass up through the pipe G into the feed-water heater or out into the air, as may be desired. When the steam has fallen to nearly atmospheric pressure, both valves drop, closing the valve F and opening the valve M, thereby allowing the remaining steam to pass into the condenser, thus having to condense only a small portion of the steam to produce a vacuum in the cylinder, as well as obviating the use of the large quantity of water when all the steam is passed into the condenser.

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

The exhaust-pipe herein described, having two branch pipes, constructed substantially as shown, said branch pipes being provided with automatically-operating valves, opening in opposite directions, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JAMES C. LINNELL.

Witnesses:
R. B. ROBBINS,
H. Z. WENTWORTH.