J. C. LINNELL.

Exhaust-Pipe for Locomotives.

No. 212,560. Patented Feb. 25, 1879.

Fig. 1.

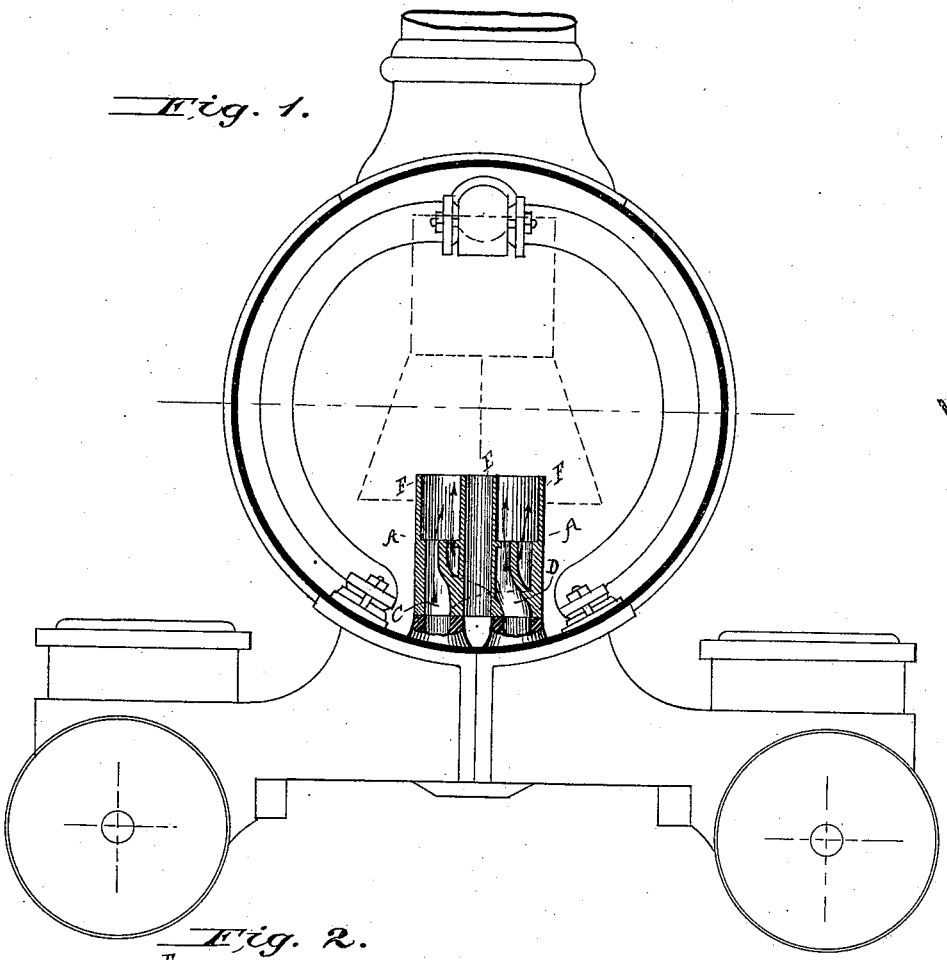


Fig. 2.

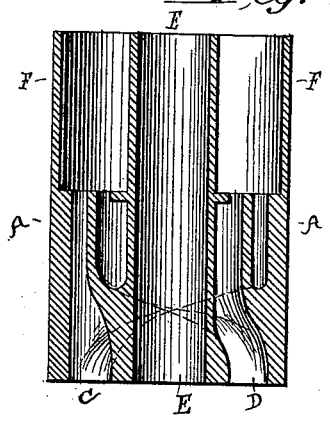


Fig. 3.

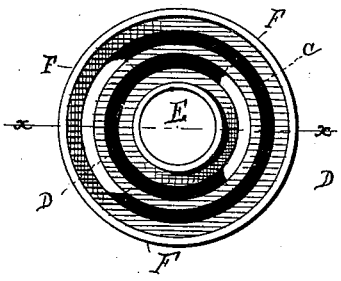
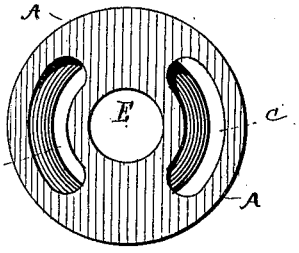


Fig. 4.



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Atty.

UNITED STATES PATENT OFFICE.

JAMES C. LINNELL, OF ADRIAN, ASSIGNOR OF ONE-HALF HIS RIGHT TO S. S. LINNELL, OF KALAMAZOO, MICHIGAN.

IMPROVEMENT IN EXHAUST-PIPES FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **212,560**, dated February 25, 1879; application filed September 11, 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 for Locomotives; 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 locomotives; and the invention consists in the construction and arrangement of parts, 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 view showing the double nozzle in position under the smoke-stack of a locomotive, the nozzle being in section. Fig. 2 is a central vertical section of the double nozzle, taken on line *x x* of Fig. 3. Fig. 3 is a top view, and Fig. 4 is a bottom view.

In the drawings, A represents the double nozzle. This nozzle is formed with two steam-passages, C D, and a central passage, E.

The steam-passage D, connecting with one cylinder a suitable distance above the lower end of the nozzle, extends completely around the central passage, E, as shown in Fig. 3 of drawings.

The steam-passage C, connecting with the other cylinder a suitable distance above the lower end of the nozzle, extends completely around that part of the passage D extending around the central passage, E, as shown in Figs. 1, 2, and 3 of drawings.

The central passage, E, and pipe F extend up above the steam-passages C and D, as shown in Figs. 1 and 2 of drawings.

The operation is as follows: When the exhaust-steam first comes from either cylinder, its greatest force creates a partial vacuum in the space between the passage E and pipe F and the other cylinder, by sucking the steam out, thus alternately reducing the back-pressure in each cylinder. The steam, on passing beyond the pipe F, creates a strong draft through the air-passage E.

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

1. An exhaust-nozzle having two independent steam-passages, C and D, the passage D surrounding the central passage, E, and the passage C surrounding the passage D, constructed and arranged as shown and set forth.

2. An exhaust-nozzle having a central passage, E, pipe F, and two independent steam-passages, C and D, constructed and arranged as shown and 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,

JOHN L. SCHOOLCRAFT.