J. C. FARMER.

EXHAUST-PIPES FOR LOCOMOTIVES.

No. 186,417. Patented Jan. 23, 1877.

Fig. 4.

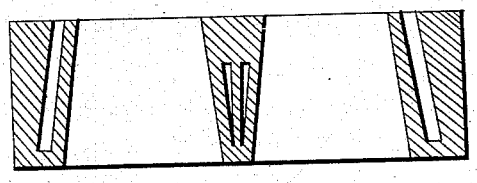


Fig. 2.

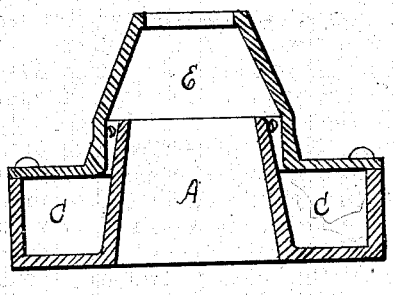


Fig. 1.

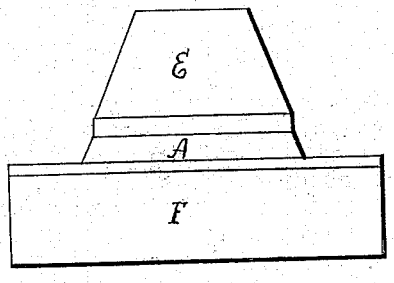
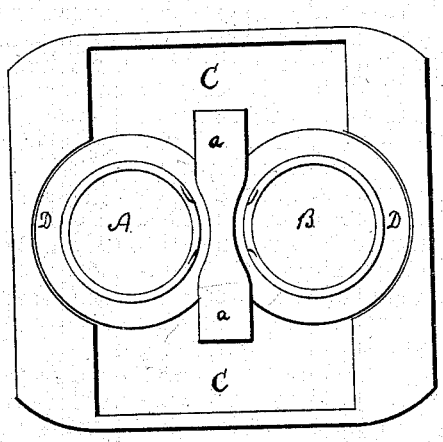


Fig. 3.



Witnesses.
Jon. F. Barrett
Robert Kenney

Inventor:
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UNITED STATES PATENT OFFICE.

JAMES C. FARMER, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN W. WHITE, OF DEDHAM, MASS.

IMPROVEMENT IN EXHAUST-PIPES FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. **186,417**, dated January 23, 1877; application filed November 16, 1876.

To all whom it may concern:

Be it known that I, JAMES C. FARMER, of the city of Providence, in the State of Rhode Island, have invented an Improvement in Exhaust-Pipes for Locomotive and other similar Steam-Engines, of which the following is a specification:

My invention is designed as an improvement on the invention for which Letters Patent were granted to me under date of September, 21, 1875, numbered 167,883.

In said former invention the two pipes, (one for each cylinder,) although cast together upon one base, in the usual way of constructing a double exhaust-pipe, act independently of each other, the "relief-chamber" (which constitutes the chief feature in that invention) of the one having no communication with that of the other, and each chamber having its independent escape-pipe. The common base, too, upon which the exhaust-pipes are cast, serves, in that invention, only the further purpose of a plate through which the bolts pass by which the pipes are fastened in place, and is made of a thickness only to afford the necessary strength for that purpose. In other words, in my former invention there is no combination between the one pipe or any of its operating parts and the other or any of its operating parts.

In my present improvement I make the base of a thickness of from two to three inches, and cast it hollow, forming within it a chamber as large as is consistent with retaining sufficient stiffness in the casting, and into this chamber in the base I extend or enter the annular space surrounding each pipe, and which, in my former invention, forms its relief-chamber. I also dispense with the escape-pipes described in my former invention. By this arrangement the annular spaces of the two pipes are brought into communication with each other through the chamber in the base common to both, and the exhaust steam that fails to find ready exit directly through either exhaust-pipe and its nozzle is deflected, by way of the annular space surrounding that pipe, into the common chamber in the base, and thence escapes by way of the annular space surrounding the other exhaust-pipe through the nozzle of that pipe, so that the nozzle of each exhaust-pipe acts not only in its ordinary capacity in independent connection with the pipe to which it is attached, but the two nozzles also act alternately in the capacity of escape-pipes to the common relief-chamber.

In this improvement the relief-chamber space is greatly, and, as I think, advantageously enlarged. I do not undertake to point out nor intend to confine myself to any particular dimensions; but in perfecting my improvement I have found that the more this space was enlarged the better the result. It is practicable to enlarge it still further by increasing the thickness of the base, or extending it laterally within the limits necessitated by its position on the engine.

It is an essential feature in my improvement that the exhaust steam that is deflected by back pressure into the annular space surrounding one pipe, and thence into the common relief-chamber, is enabled to escape therefrom without passing through or entering or otherwise obstructing the other pipe, but by a channel which is independent of the other pipe until its nozzle is reached, through which nozzle this channel discharges only in the interval when such other pipe is not discharging through it.

If the two annular spaces surrounding the main pipes were connected at or near their bases by a simple pipe, the result would be an inferior form of my improvement, but it would illustrate its principle.

Figure 1 is an end elevation, in which F represents the base; A, one of the main pipes projecting above the base, and E its detachable nozzle.

Fig. 2 is a cross-section, in which A is one of the main pipes; E, its nozzle, and C C the common relief-chamber in the base. D D show the annular space surrounding the main pipe.

Fig. 3 is a plan of the base in horizontal section, designed to show its interior, in which A and B are the two main pipes; D D, the annular spaces surrounding each pipe, respectively, and communicating with C C, which is the common relief-chamber in the base. *a a* is a block cast upon the base, through which bolts pass, in addition to four bolts at the

corners, to hold the device in place on the engine. *a a* serve no other purpose.

In construction every part of the double exhaust-pipe is made in one casting, excepting only the detachable nozzles.

I claim as my invention—

1. In a double exhaust-pipe, the two pipes A and B, each surrounded by the annular space D, in combination with the common relief-chamber C.

2. In a double exhaust-pipe, the relief-chamber C, communicating with and receiving the exhaust steam deflected by back pressure from each exhaust-pipe.

JAMES C. FARMER.

Witnesses:
JON. F. BARRETT,
ROBERT KENNEY.