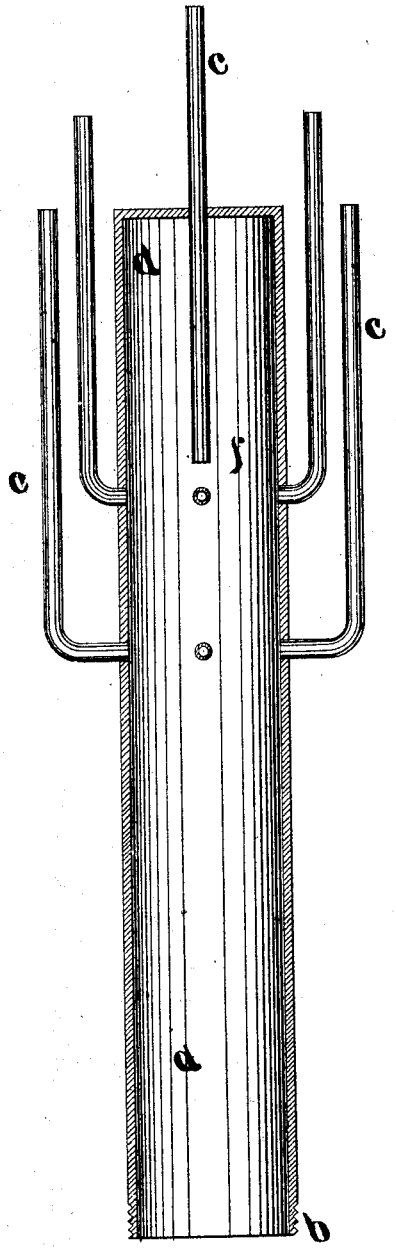
T. SHAW.

Exhaust-Nozzle.

No. 166,562. Patented Aug. 10, 1875.



Witness. W. F. Brey
Wm Garwood

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UNITED STATES PATENT OFFICE.

THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN EXHAUST-NOZZLES.

Specification forming part of Letters Patent No. **166,562**, dated August 10, 1875; application filed May 17, 1875.

To all whom it may concern:

Be it known that I, THOMAS SHAW, of the city and county of Philadelphia, Pennsylvania, have invented a new and Improved Exhaust-Nozzle, which is an improvement to my patent of December 8, 1874, No. 157,548; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists in the manner of dividing the exhaust of locomotive-engines, as hereinafter described.

The object of the invention is to prevent the shooting character of the ordinary exhaust, and to quiet the noise from the exhaust, and to save the coal that has heretofore been shot out of the stack, and to enable the use of straight stacks, and to dispense with screens, petticoat-pipes, &c.

In order to enable others to use and practice my invention, I will proceed to describe its construction and operation.

On reference to the accompanying drawings, which form part of the specification, the sketch represents a vertical section through center of the nozzle, of which *a* is the main pipe, which is provided with an ordinary screw-thread, *b*, for attachment to the exhaust of the engines. It stands erect in the center of the smoke-stack, and is closed at the top. The exhaust-nozzle *c* passes from the top through the cap downward, and is tapped into the side of the pipe, and is projected upward, as shown in sketch. A steam chamber or space is left in the tube *a*, above the point *f*, below which all the tubes *c* are attached or arranged to allow the escape of steam; but the outer ends of all the tubes are arranged within the stack and above the smoke-box. The tubes *c* are arranged in sufficient quantity to equal in area the ordinary exhaust-nozzle, or as the circumstances of the draft requires.

It is important that the tubes *c* be placed at different points throughout the length of the stack, and that their outer ends be divided as much as possible throughout the length of stack. This division of the exhaust prevents the sharp shooting of the exhaust, and prolongs the draft occasioned by the exhaust.

The steam-chamber *d* receives the first shock of the exhaust upon an elastic cushion of steam, which absorbs the violence of the same, and the recoil of the cushion contributes to a more steady draft. The long narrow passage-ways of tubes *c* absorb the noisome vibration against the walls of the same.

This character of exhaust-nozzle requires no screen over the stack to retain the nut coal, as all shooting action has ceased; nor does it require the petticoat-pipe, as the draft is sufficient without the same, and a straight stack works best with this improved nozzle.

It will be evident that annular passage-ways can be substituted for the tubes without any alteration in the result.

What I claim, and desire to secure by Letters Patent, is—

The combination of the steam-chamber *d* with the tubes *c* and the exhaust-pipe *a*, as described, and for the purpose set forth.

THOMAS SHAW.

Witnesses:
WM. F. BREY,
WM. GARWOOD.