A. S. Smith,

Locomotive.

No. 113,216. Patented Mar. 28. 1871.

Fig. 1.

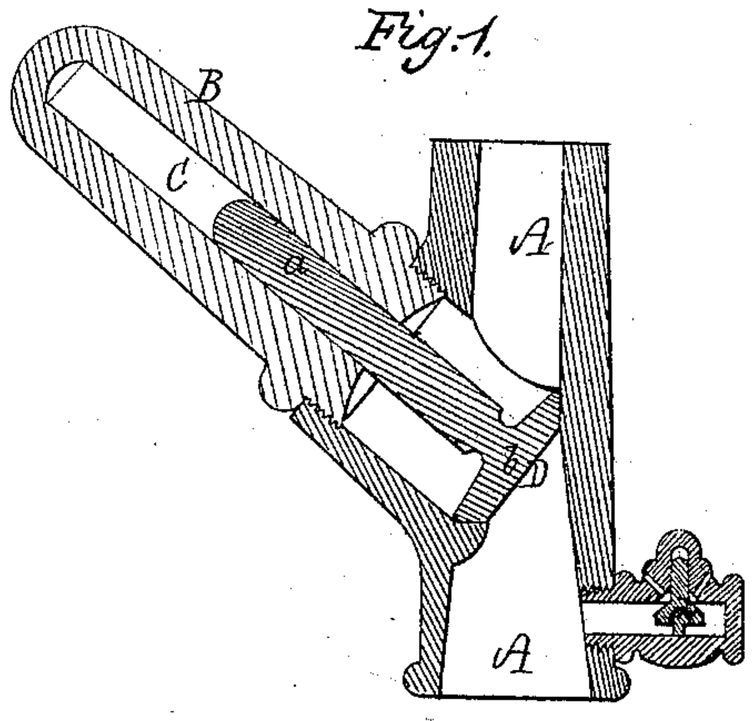
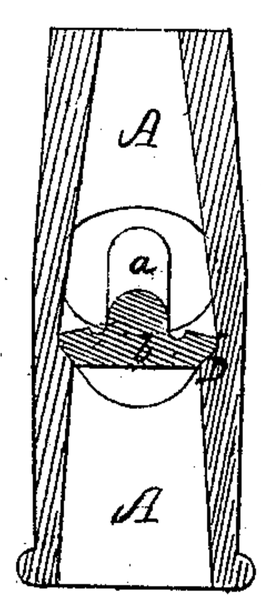


Fig. 2.



Witnesses.

Edward Griffith.

Geo. A. Lorring.

Albert S. Smith.

by his Attorney.

Frederick Curtis

United States Patent Office.

ALBERT S. SMITH, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 113,216, dated March 28, 1871.

IMPROVEMENT IN LOCOMOTIVES.

The Schedule referred to in these Letters Patent and making part of the same.

To all to whom these presents shall come:

Be it known that I, ALBERT S. SMITH, of Boston, in the county of Suffolk and State of Massachusetts, have made an invention of certain Improvements in Locomotive-Engines; and do hereby declare the following to be a full, clear, and exact description thereof, due reference being had to the accompanying drawing making part of this specification, and in which—

Figure 1 is a vertical central and longitudinal section, and

Figure 2, a transverse section of the exhaust-pipe of a locomotive-engine with my improvements added thereto.

Upon closing the throttle-valve of a locomotive and shutting off entrance of steam to the cylinder thereof, or upon reversing the action of the steam upon the piston, as is frequently done in emergencies, in which case the momentum of the engine drives such piston against the direct force of the steam, the engine is converted into a powerful air-pump, which drives air from the atmosphere through the exhaust-pipe into the boiler or steam-dome.

This current of air carries with it a greater or lesser quantity of cinders from the smoke-stack, and deposits them about the valve and seat of the engine, which, in the case of coal-burning engines, soon scars and defaces the parts to such an extent as to incapacitate the locomotive and necessitate the repairing of the same.

It has long been an object with engineers to devise some means of obviating this objectionable feature in locomotive-engines, and the purpose of this invention is to accomplish the desired object by retaining the cinders within the exhaust-pipe until the exhaust-blast from the cylinder expels them therefrom.

To carry out this object, and to develop one mode in which my invention may be pursued, I apply to the interior of the exhaust or blast-pipe a valve and valve-seat, so arranged that, upon the attempted induction of air through the said pipe, the valve shall close and shut off this passage of air to the steam-chest, the vacuum within the lower part of the pipe, which would naturally ensue, being obviated by an air-inlet-port, provided with an inwardly-opening valve, the whole being arranged and operating as hereinafter explained.

The drawing accompanying this specification, and illustrating my invention, represents at A the upper portion of the exhaust or blast-pipe of a locomotive-engine of the form now generally adopted.

In pursuing the purposes of my invention I affix upon one side of the stand-pipe A a sloping boss or enlargement, B, rising at an angle of about forty-five degrees to the axis of the pipe, such boss being recessed, as shown at C, to contain the stem *a* of a valve, *b*.

D represents a valve-seat formed within the pipe A, and extending diagonally across it, in alignment with and at right angles to the axis of the valve-stem before mentioned, the length of this valve-stem being sufficient to enable the valve to entirely traverse and embrace the diameter of the pipe and shut off communication through it, the said stem playing within its socket with sufficient freedom to allow the valve to drop by its own gravity upon its seat.

If considered preferable, a rubber or other spring may be inserted in the socket C, at the base of the valve-stem, for advancing the valve to its seat, and this spring would further serve the purpose of a cushion to deaden the concussion and noise which might otherwise ensue by the sudden ascent of the valve by the action of the exhaust steam from the cylinder.

A small check-valve, *d*, is applied to the stand-pipe A, for the purpose of admission only of air to the interior of the same, and the outlet of this pipe should and will naturally be sufficiently remote from the smoke-stack to be free from the access of cinders.

When the engineer closes the throttle-valve or reverses the engine, the natural result will be a powerful suction of air downward through the pipe A.

The valve *b*, however, at this instant closes, and is forced tightly to its seat by this suction, as a consequence keeping back the cinders within the smoke-stack, which would otherwise be drawn into the steam-chest with evil results before stated.

To relieve the vacuum which would exist below the valve *b* the check-valve *d* is applied, and it effects its purpose by permitting air to freely enter the pipe A, but closes instantly when the exhaust steam from the cylinders enter this pipe.

The cinders effect a lodgment about the valve *b* and above it, within the upper part of the exhaust-pipe A, until the arrival of the first succeeding blast of exhaust steam from the cylinders, which entirely expels them, and at the same time closes the check-valve *d*.

Claims.

I claim—

1. The combination, with the exhaust-pipe of a locomotive-engine, of a valve, arranged to close such pipe during stoppage or reversal of the engine, an air-inlet valve for relieving the vacuum which arises within the pipe when the first-mentioned valve is closed, substantially as and for the purposes set forth.

2. The herein-described combination of stand-pipe A and valves D and *d*, the same operating in manner and to effect purposes before stated.

ALBERT S. SMITH.

Witnesses:

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