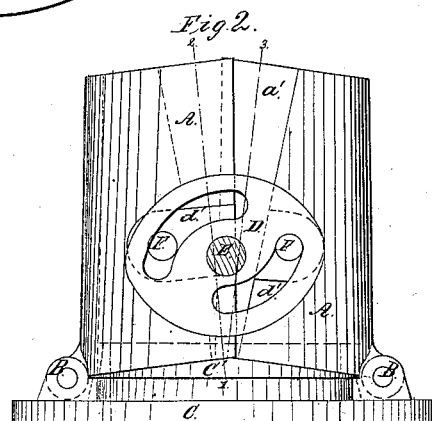
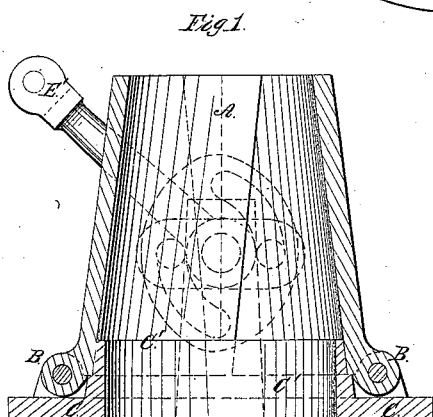
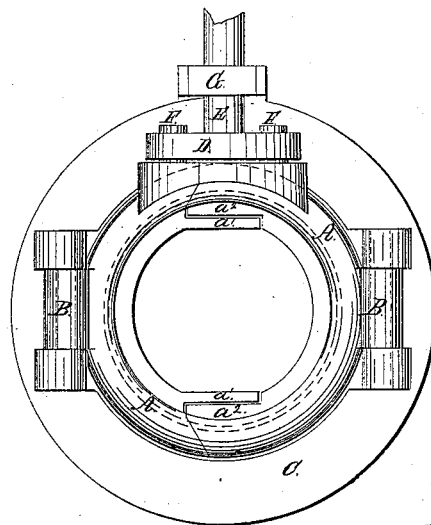
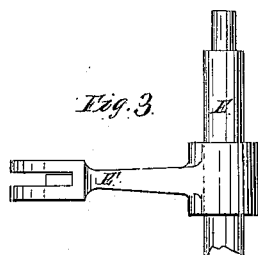


M. E. Brown,
Exhaust Mechanism for Locomotives.
N^o 46,445. Patented Feb. 21, 1865.



Witnesses:

W. L. Fortbush
Geo. M. Wallace

Inventor:

Myron E. Brown

UNITED STATES PATENT OFFICE.

MYRON E. BROWN, OF BUFFALO, NEW YORK.

IMPROVEMENT IN VARIABLE-EXHAUST NOZZLES.

Specification forming part of Letters Patent No. 46,445, dated February 21, 1865.

To all whom it may concern:

Be it known that I, MYRON E. BROWN, of the city of Buffalo, county of Erie, and State of New York, have invented certain new and useful Improvements in Variable-Exhaust Nozzles for Locomotive and other Engines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure I is a vertical section of my improved nozzle when contracted to give full force to the exhaust. Fig. II is a side elevation of same when expanded to reduce the power of the exhaust, showing also the cam by which the expansion and contraction is effected. Fig. III is a plan of the nozzle and fixtures in the position shown in Fig. I.

The nature of this invention consists, first, in dividing the conical or contracted nozzle of an exhaust-pipe into two halves in the direction of its axis, each of the said halves or divisions being connected at its base to the main exhaust-pipe by a hinge, the axis of which is at right angles to the axis of the nozzle and opposite and parallel to the axis of the other, such construction allowing the expansion or contraction of the nozzle by the movement of the two halves on their hinges to and from each other in a manner to increase or diminish its area of discharge, and consequently increase or diminish the force and effect of the exhaust, sufficient lap being allowed at each edge of said halves to prevent the angular opening which would otherwise occur between them; secondly, in projecting a flange upwardly from the seat, and inside of the nozzle, for the purpose of breaking joints between the seat and base of the nozzle, and thereby prevent the escape of steam at the bottom of the nozzle.

Letters of like name and kind refer to like parts in each of the figures.

A represents the exhaust-nozzle, which, when closed, has the common conical or tapering form, by which the area of discharge of the exhaust-pipe is contracted to give velocity and effect to the escaping steam. This nozzle is divided longitudinally into two halves, which are connected by hinges B to a seat, C, (surmounting the exhaust-pipe,) for the purpose of allowing their movement to or from

each other to increase or diminish the area of discharge. The hinges B are located at the base of the nozzle, and have their axes of motion at right angles to the axis of the nozzle, and are opposite and parallel to each other, so that in turning thereon the halves move parallel to the same vertical plane, which insures their exact coincidence at any part of their movement.

To prevent the occurrence of an angular opening or space between the halves, as represented by the dotted red lines 1 2 and 1 3, which, in their movement from each other, would result from the mere division of the nozzle by a vertical plane, the edges of the halves are prolonged or extended so as to lap onto each other, as shown at $a' a^2$, in a manner to break the joint, the lapping surfaces being at right angles to the hinges, but parallel to the inclined side of the nozzle, the amount of lap being regulated by the required expansion of the nozzle.

The seat C has a flange, C', projecting up inside the nozzle, which flange breaks the joint between the seat and base of the nozzle and prevents the escape of steam at the base of the nozzle. At all degrees of expansion of the nozzle the two halves are made to maintain equal distances from the axis, so that the current of the escaping steam is always parallel with said axis, and its proper discharge into the smoke-stack or chimney insured.

D represents the cam by which the expansion and contraction of the nozzle is effected. It consists of a metal disk, in which two eccentric slots, d' , are cut, which slots receive the pins or studs F, projecting one from each half of the nozzle. It is secured upon the end of a horizontal shaft, E, which extends out through the smoke-arch, and carries an arm, E', by which motion may be given to the cam, a connecting-rod leading from the arm to the "cab" to bring the movement within the ready control of the engineer. The shaft E has its journal-bearing at its inner end in a standard, G, cast onto the seat C, and at its outer end in a hanger or bracket secured to the outside of the smoke-arch. The movement of the cam in one direction by the action of the eccentric slots d' upon the studs F will expand the nozzle, and its movement in the opposite direction will contract the nozzle, and increase or diminish the area of discharge. The amount

of such variation in the area of discharge, and consequently the force and effect of the "exhaust," depending on the extent of the movement communicated to the cam, thus bringing such variation within perfect control of the engineer.

Where two exhaust-nozzles are used together, as is frequently the case in locomotive-engines, the shaft E has a cam upon each end, and is placed between the nozzles, and is operated from a counter-shaft, which extend sout through the smoke-arch and carries the arm E'.

This nozzle is cheap, simple, and durable in construction, and brings the variation of the power and effect of the exhaust under perfect control to any extent required.

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

1. Making a conical nozzle in two parts or halves, the said halves being hinged at the base and so constructed that they lap past each other, so that when expanded by being moved upon their hinges the lapping parts will prevent any break or opening between the halves, substantially as described, and for the purposes set forth.

2. The flange C', projecting upwardly inside the nozzle, for the purpose of breaking joints between the seat and base of the nozzle, and thus (by carrying the flange above the joint) prevent steam from escaping at the bottom of the nozzle, substantially as described.

M. E. BROWN.

Witnesses:

GEO. W. WALLACE,
W. H. FORBUSH.