No. 650,227. Patented May 22, 1900.

J. W. BUTE.

BLAST EXHAUST NOZZLE.

(Application filed Feb. 27 1900.)

(No Model.)

FIG. 1.

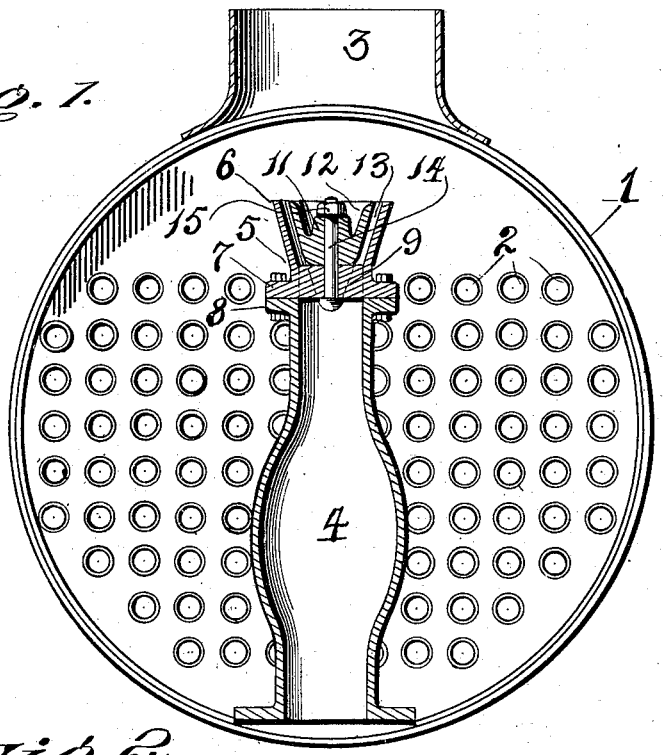


FIG. 2.

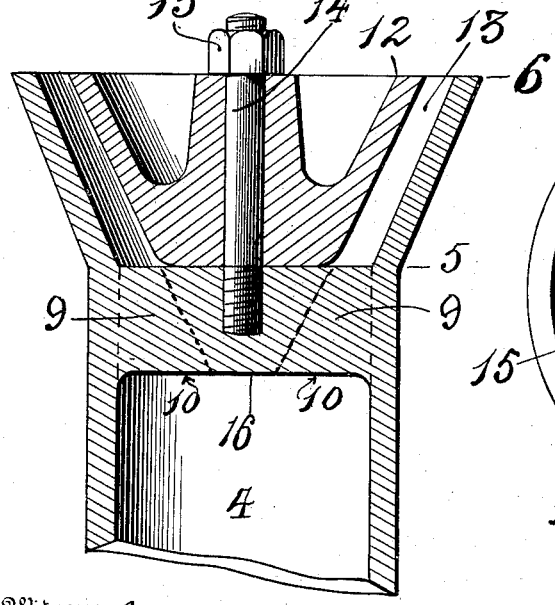
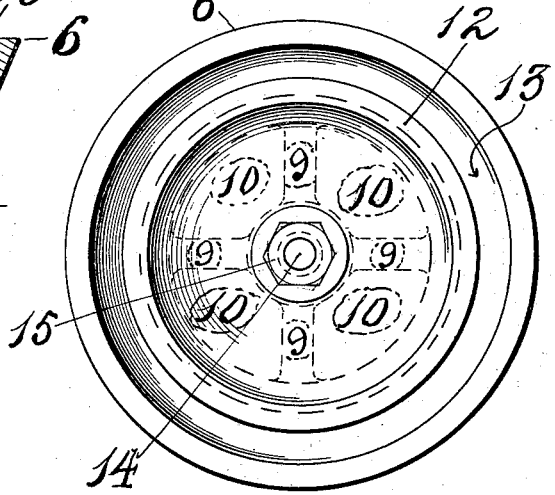


FIG. 3.



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UNITED STATES PATENT OFFICE.

JOHN W. BUTE, OF BUCYRUS, OHIO.

BLAST EXHAUST-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 650,227, dated May 22, 1900.

Application filed February 27, 1900. Serial No. 6,747. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. BUTE, a citizen of the United States, and a resident of Bucyrus, in the county of Crawford, State of Ohio, have invented new and useful Improvements in Blast Exhaust-Nozzles, of which the following is a specification.

The object of my invention is to provide an exhaust-nozzle for location beneath the smoke-stack of a locomotive, through which the exhaust-steam from the cylinders is discharged and which will overcome back-pressure in the cylinders and down-currents in the stack and produce a more perfect vacuum in the smoke-box.

To these ends my invention consists in certain features of construction, which will be hereinafter fully described, and particularly pointed out in the claim, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 is a transverse section through the smoke-box of a locomotive in the vertical plane of the stack and the blast-nozzle. Figs. 2 and 3 are respectively a vertical section and a plan of a slightly-modified construction of the blast-nozzle.

1 represents the smoke-box of a locomotive, into which the forward ends of the fire-tubes 2 discharge, and 3 is the base of a smoke-stack.

4 represents the blast-nozzle forming the subject of my invention, which is centered beneath the smoke-stack 3 and is designed to be connected in a manner well known in such devices to the exhaust-ports of the working cylinders of the engine.

Exhaust-nozzles as heretofore constructed have been ineffective either in that they do not overcome down-currents in the stack resulting from the vacuum in the smoke-box and the atmospheric pressure above the stack or because of failure to prevent back pressure upon the steam-cylinders. My invention overcomes these difficulties by a peculiar construction of the crown 5, that surmounts the nozzle. This crown comprises a flaring outer shell 6, preferably formed at its base with an annular flange 7, that bolts upon a corresponding flange 8 at the upper end of the nozzle 4, and with cross-bars 9, forming a support at the base of said crown, with steam-passages 10 between them, as shown more clearly in Fig. 3 and also suggested by the dotted lines in Figs. 1 and 2; also, a spreading-cone 11, which enters the shell 6 and has an outer wall 12 parallel to but spaced apart from the shell 6, so as to leave a uniform flaring annular steam-passage 13, said cone being centered within the shell and firmly fixed upon the support 9 by means of a bolt 14, that either passes through said support, as shown in Fig. 1, or is screwed into the support, as shown in Fig. 2, and extends vertically through the cone and is provided with a nut 15 upon its upper end. The upper edges of the cone and shell are in substantially the same plane, and the steam forced through the passage 13 passes upward in an expanding annular column into contact with the inner wall of the stack. The openings between the cross-arms of the support 9 are formed by segments of the cylindrical wall of the nozzle 4 and the downwardly-tapering sides of the central boss 16, from which the arms of the support radiate.

I have found by actual test that a blast-nozzle constructed as above described will accomplish the several objects of my invention and overcome the difficulties which have been experienced with devices of this character as heretofore constructed.

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

In combination with a blast-nozzle 4 terminating in an upper annular flange 8; the crown 5, comprising a flaring shell 6, having a flange 7 bolted to said flange 8 and boss 16 having supporting-arms 9 leaving passages 10 between them; and the cone 11 centered within the shell 6, secured upon the boss 16 by means of bolt 14, and provided with an upwardly-flaring wall 12 parallel to and spaced apart from the shell 6 and forming with the latter an upwardly-flaring straight annular steam-passage 13.

JOHN W. BUTE.

Witnesses:
EDWARD VOLLRATH,
FRANK LA RUE.