

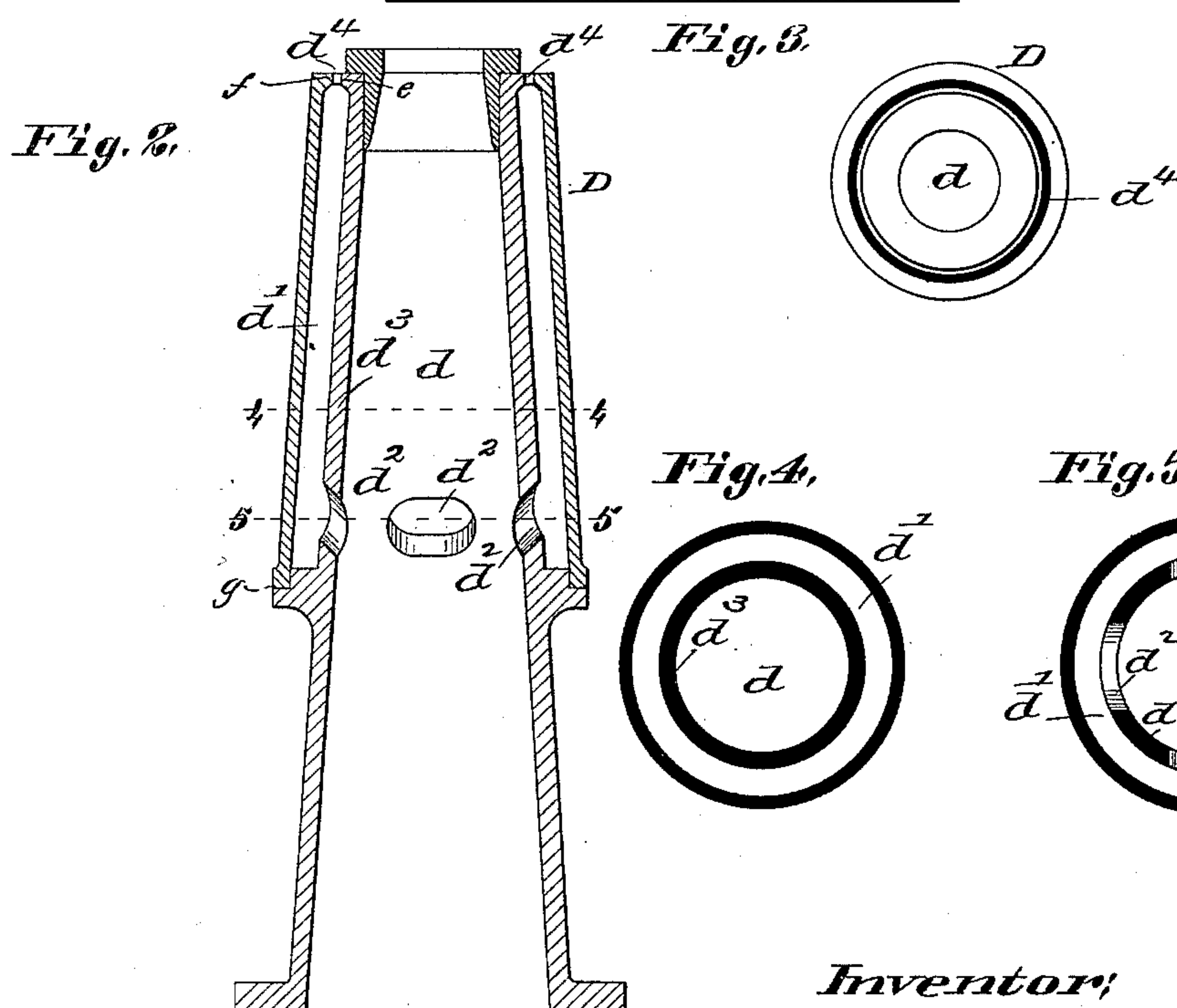
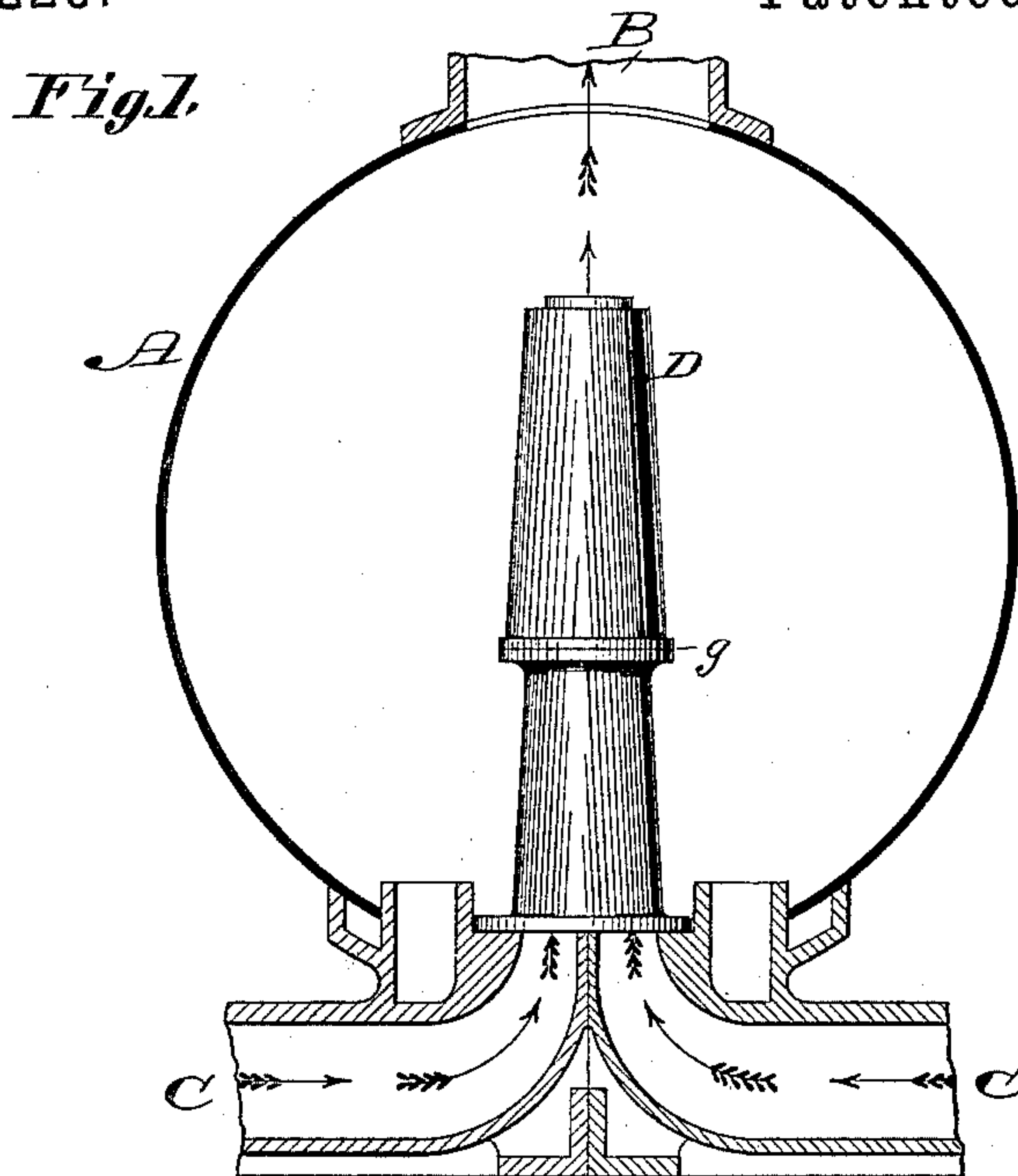
(No Model.)

H. M. SMITH.

EXHAUST NOZZLE FOR LOCOMOTIVES.

No. 339,226.

Patented Apr. 6, 1886.



Attest:
Charles Pickles,
J.W. Hoke.

Inventor;
Howard M. Smith
by C. D. Moody
att'y

UNITED STATES PATENT OFFICE.

HOWARD M. SMITH, OF ST. LOUIS, MISSOURI.

EXHAUST-NOZZLE FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 339,226, dated April 6, 1886.

Application filed September 30, 1884. Serial No. 144,355. (No model.)

To all whom it may concern:

Be it known that I, HOWARD M. SMITH, of St. Louis, Missouri, have made a new and useful Improvement in Exhaust - Nozzles for Locomotives, of which the following is a full, clear, and exact description, sufficient to enable others skilled in the class of construction to which the improvement relates to make and use the same.

The aim and effect of the improvement, which consists in providing the nozzle with an additional outlet or outlets, through which the steam can exhaust, is to improve the draft in the stack and relieve the engine-cylinders.

The mechanism adopted for carrying out the improvement is shown in the annexed drawings, in which—

Figure 1 is a vertical cross-section of a locomotive-boiler having the improvement, the nozzle being shown in elevation, and only those parts being exhibited which are essential to an understanding of the construction; Fig. 2, a vertical section, upon an enlarged scale, of the nozzle; Fig. 3, a top view of the nozzle; Fig. 4, a horizontal section on the line 4 4 of Fig. 2, and Fig. 5 a horizontal section on the line 5 5 of Fig. 2.

The same letters of reference denote the same parts.

A, Fig. 1, represents the boiler of the locomotive. B represents the stack, and C C represent the exhaust-pipes which lead from the cylinders, respectively. All of these parts are of the customary form.

D represents the exhaust-nozzle. It occupies the usual place, and the pipes C C are adapted to discharge the exhaust-steam into it in the usual manner. The exhaust-nozzle, however, in place of having but a single passage through which the steam can be delivered into the stack or through which it can escape, has more than one passage—that is to say, the nozzle, in addition to the central passage, d , has the passage d' , and this last-named passage is in an annular form, surrounding the passage d and communicating

therewith by means of the passages d^2 , which lead through the shell d^3 of the nozzle. The passage d' preferably begins about midway in the height of the nozzle, and extends thence to the upper end of the nozzle, the outlet from it being at d^4 . The exhaust-steam which is delivered into the exhaust-nozzle passes upward therein to the level of the passages d^2 . The steam-current then divides, a portion continuing upward through the central passage, d , and a portion passing into the annular chamber d' , thence to be discharged through the outlet d^4 , and from the nozzle both currents pass into the stack.

To give proper velocity to the steam as it passes from the annular chamber d' , the exit of said chamber should be sharply contracted. The means which I have devised for this purpose consist of an outwardly-turned beveled flange, e , upon the upper edge of the inner shell of the nozzle, and an inwardly-turned beveled flange, f , formed upon the corresponding edge of the outer shell and on a level with the flange e when the two shells are fitted together. At g is shown the joint between said parts, accurately made, so that when the parts are in position a small and even annular space is left all around the nozzle.

I am aware that exhaust-nozzles have heretofore been made with two or more passages, and I therefore do not claim such a nozzle, broadly; nor do I claim a nozzle having a contracted annular opening; but

What I claim is—

In an exhaust-nozzle, the combination of the inner and outer shells combined to form an annular chamber, d' , the inner shell being provided with upwardly-inclined apertures d^2 , leading into said chamber, and one or both shells having a flange for sharply contracting the annular exit from said chamber, substantially as set forth.

HOWARD M. SMITH.

Witnesses:

C. D. MOODY,
J. W. HOKE.