(No Model.)

W. E. BORBRIDGE.

LOCOMOTIVE EXHAUST PIPE.

No. 567,122. Patented Sept. 8, 1896.

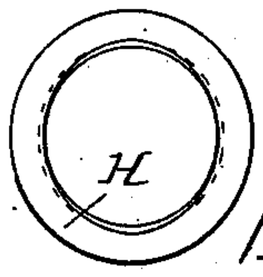

FIG. 7.

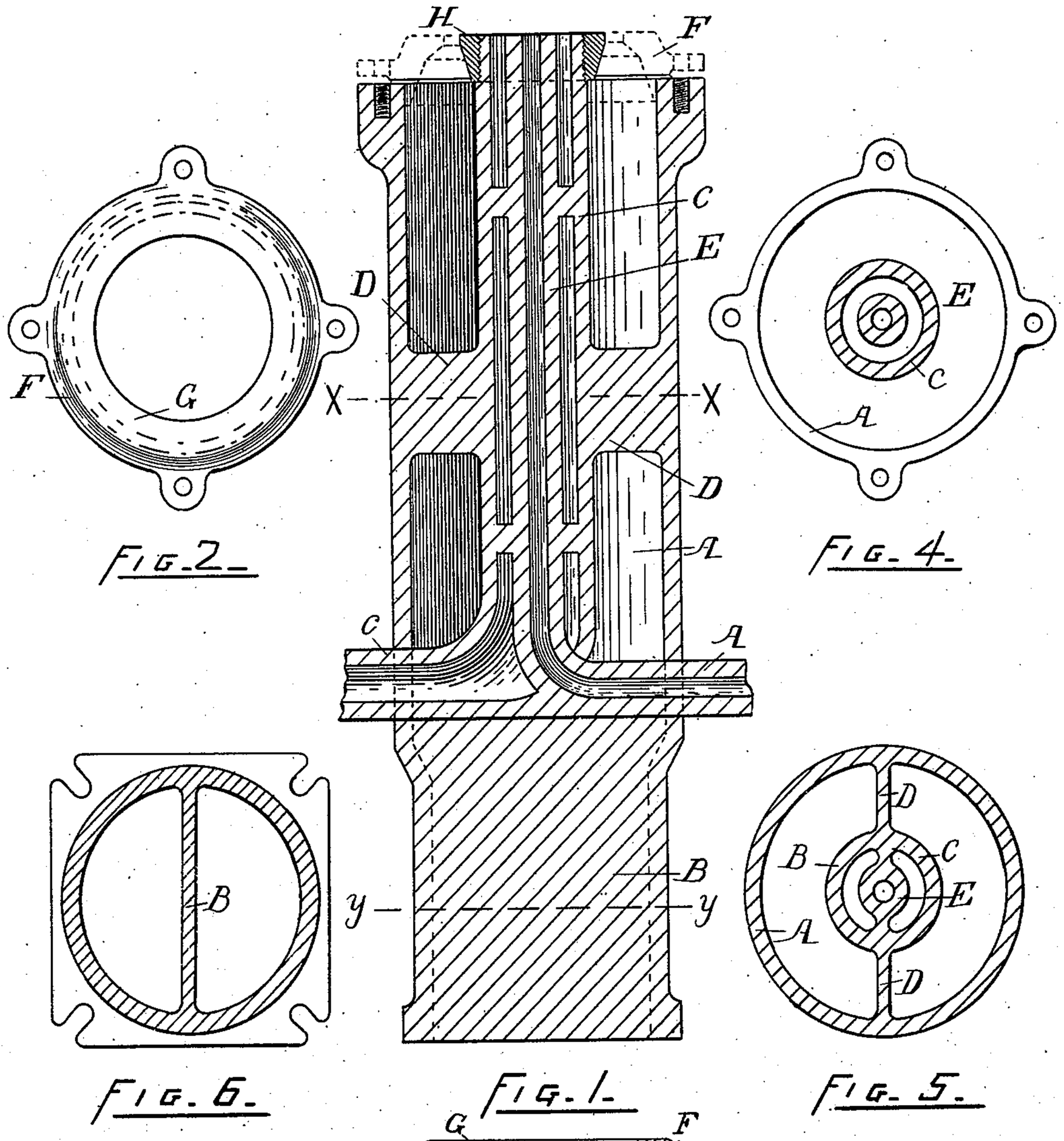

FIG. 2.

FIG. 6.

FIG. 4.

FIG. 5.

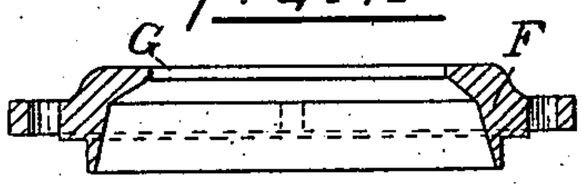

FIG. 3.

FIG. 1.

Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM E. BORBRIDGE, OF OTTAWA, CANADA.

LOCOMOTIVE EXHAUST-PIPE.

SPECIFICATION forming part of Letters Patent No. 567,122, dated September 8, 1896.

Application filed April 21, 1896. Serial No. 588,518. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EDWARD BORBRIDGE, a citizen of the Dominion of Canada, and a subject of the Queen of Great Britain, residing in the city of Ottawa, in the county of Carleton, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Locomotive Exhaust-Pipes, of which the following is a specification.

The objects of my invention are, first, to provide such improvement in the directing of the exhaust and draft starting jet of steam in locomotive-engines and the exhausted steam from the air-brake, improve the draft of the furnace thereby, and to obviate to the uneven cutting or wearing of the smoke-stack by sideward blasts of the steam-jets and air-pump exhaust by so diffusing this steam that it will be exhausted centrally in the smoke-stack. I attain these objects by means of the peculiar arrangement and combination of the blower and exhaust pipes, which is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of that part of the main exhaust-pipe of a locomotive-engine which embodies my invention. Fig. 2 is a plan view; Fig. 3, a sectional view of the exhaust-nozzle. Fig. 4 is a top or plan view of the device without the nozzle, the interior pipe being shown in section; Fig. 5, a transverse section on line X X, Fig. 1; Fig. 6, a sectional plan view on line Y Y. Fig. 7 shows the expanding ring, shown also in place in Fig. 1.

In the present practice of the construction of locomotive-engines on which air-brakes are used both the blower, a small pipe for sending steam through the smoke-stack, and thus creating a draft when the engine is standing, and the exhaust from the air-brake are placed separately and outside the main exhaust-pipe of the engine, which is always placed directly under the center of the smoke-stack, and therefore it follows that the escaping steam from these smaller pipes strikes with great force against some one part of the wall of the smoke-stack, and its continual friction at this point soon cuts through the wall and necessitates repairs. It will be seen that this difficulty is entirely avoided by my arrangement of the pipes as herein shown, as each of the three pipes is placed directly central under the smoke-stack.

It will also be seen from what follows that a further and important advantage is presented by my invention, namely, that the exhaust-steam from the cylinders is directed to fill especially the space adjacent to the wall of the smoke-stack, the center of the column being filled by the exhaust-steam from the air-brake, thus insuring a perfect draft.

The main exhaust-pipe A is secured to the saddle of the engine-frame immediately under the smoke-stack. A portion of this pipe from its base upward is divided vertically by a central wall B, which keeps the exhaust-blasts from the cylinders separate. A pipe C is cast central in the pipe A, extending from above its top end (see Fig. 1) to a suitable point near its base, where it is turned outward, projecting through the side of the pipe A. The pipe C is for leading off the exhaust-steam from the air-brake and is steadied in the pipe A by the webs D, cast integral with both these pipes, or, if preferred, the wall B may be continued to the top of the pipe A. The blower-pipe E is for sending a jet of steam into the smoke-stack. To create draft in the furnace when the engine is standing, it is also cast integral with and centrally in the pipe C, projecting outward at its lower extremity through the walls of both pipes A and C. At or below the entrance of the pipes C and E to the pipe A the diameter of the latter is increased sufficiently to retain the same sectional area throughout its length.

In order to increase the draft, it is sometimes necessary to contract the column of exhaust-steam before it enters the smoke-stack. This is accomplished by means of the exhaust-nozzle plate F, which is secured to the top of the pipe A, and has the inwardly-projecting lip G. By unscrewing the expanding ring H the size of the opening for the passage of exhaust-steam through the nozzle-plate F is increased. Thus the said ring affords means for varying the strength of the blast.

It may be easily seen that by the above-described device there is provided for locomotive-engines the greatest possible exemption from uneven wearing of the parts and the most perfect draft for the furnace.

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a locomotive-engine, the herein-described arrangement of the blower, or draft-starting, and exhaust pipes, in which the exhaust-pipe of the air-brake is placed centrally in the main exhaust-pipe of the locomotive-engine, and the blower or draft-starting steam-pipe is placed centrally in the exhaust-pipe of the air-brake, substantially as shown and described.

2. The combination in a locomotive-engine of the main exhaust-pipe, with the draft-starting, and air-brake exhaust pipes placed centrally therein, a nozzle-plate secured to the main exhaust-pipe, and an expanding ring screwed on the top end of the air-brake exhaust-pipe, substantially as herein shown and described.

Signed at Ottawa this 11th day of April, 1896.

WILLIAM E. BORBRIDGE.

In presence of—
LOUIS J. COURSOLLES,
N. A. BELCOURT.