

(No Model.)

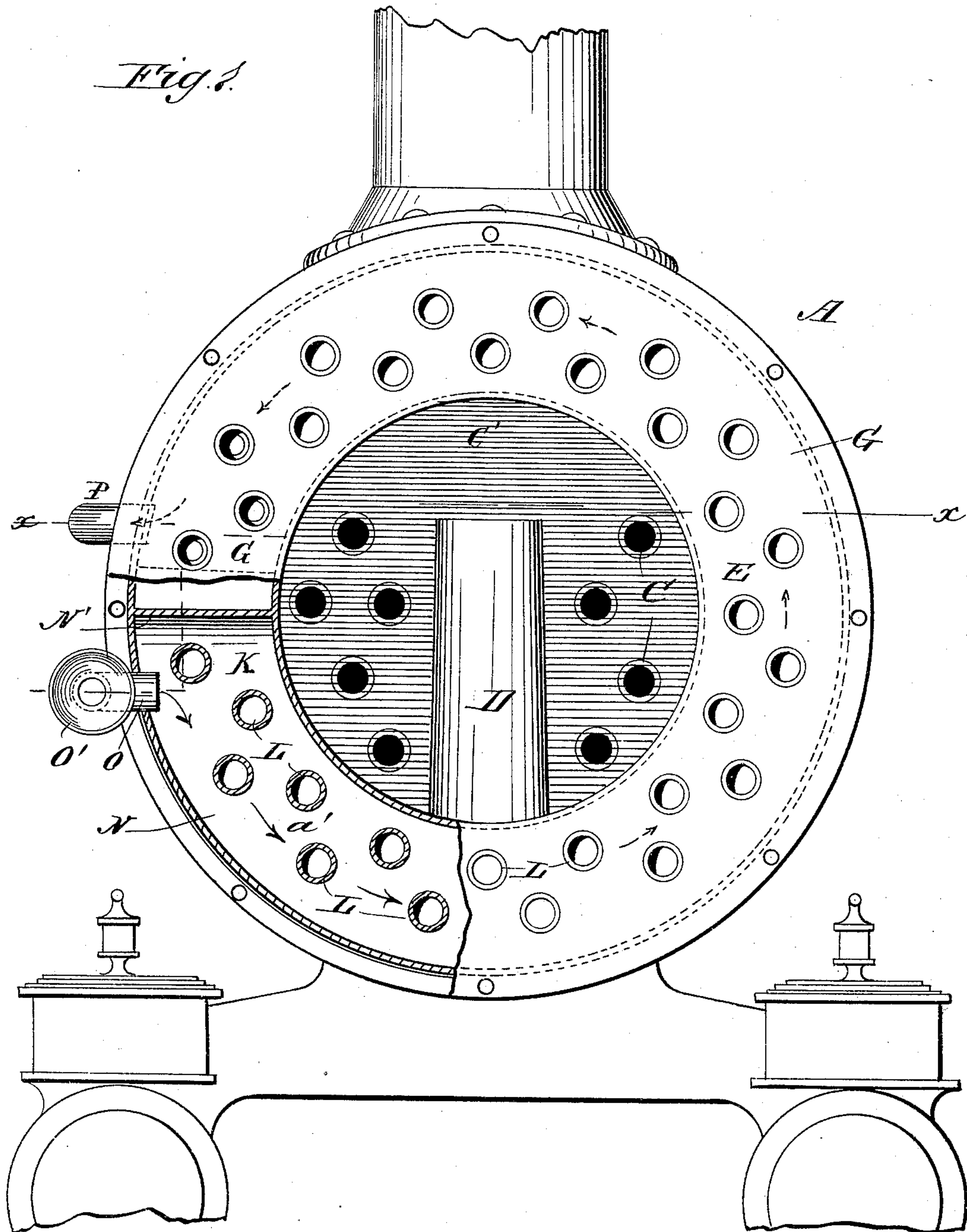
2 Sheets—Sheet 1.

E. M. CRANDALL & T. H. TURNER

HOT AIR GENERATOR.

No. 395,813.

Patented Jan. 8, 1889.



WITNESSES:

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INVENTOR:

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(No Model.)

2 Sheets—Sheet 2.

E. M. CRANDALL & T. H. TURNER.

HOT AIR GENERATOR.

No. 395,813. *Fig. 2.*

Patented Jan. 8, 1889.

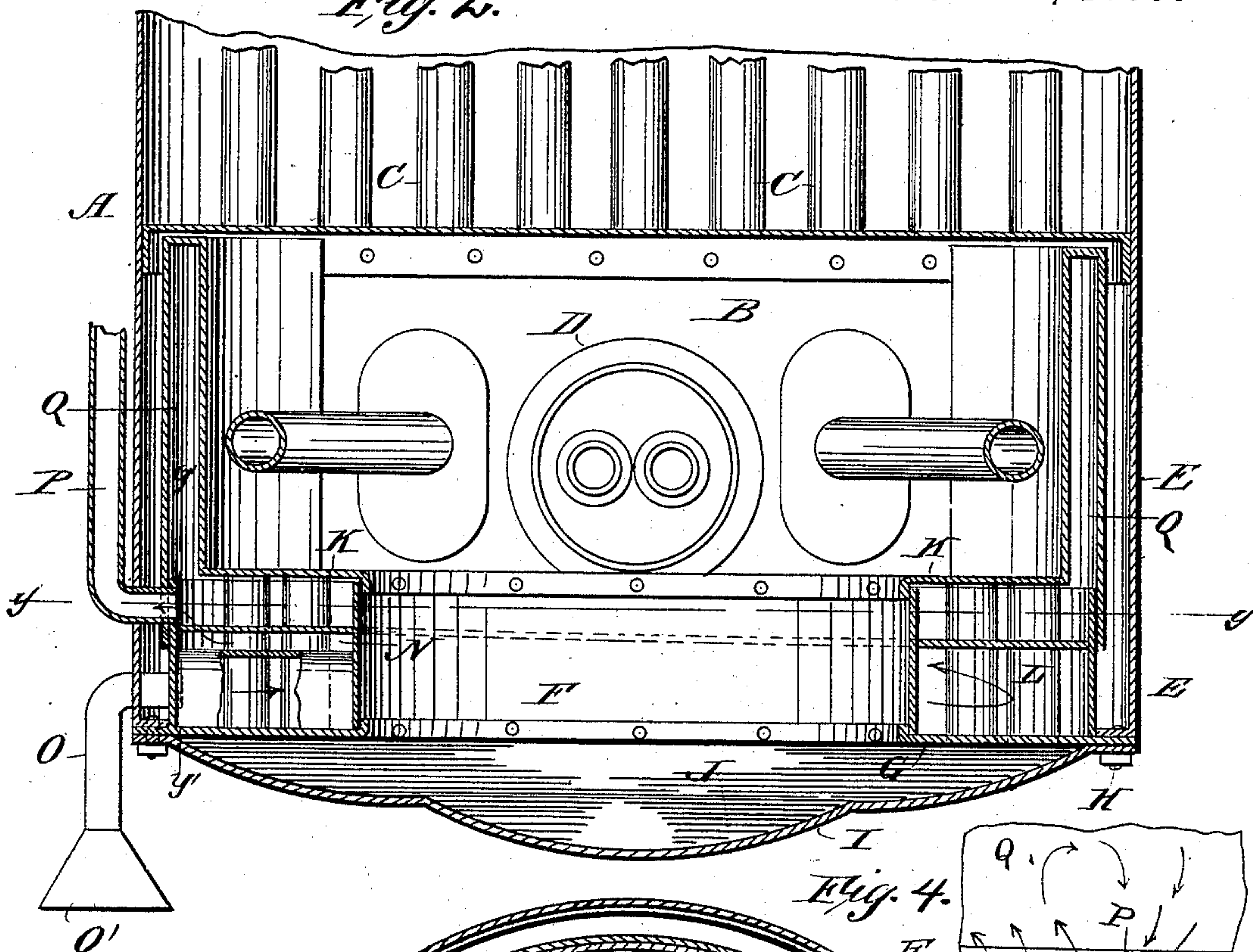


Fig. 3.

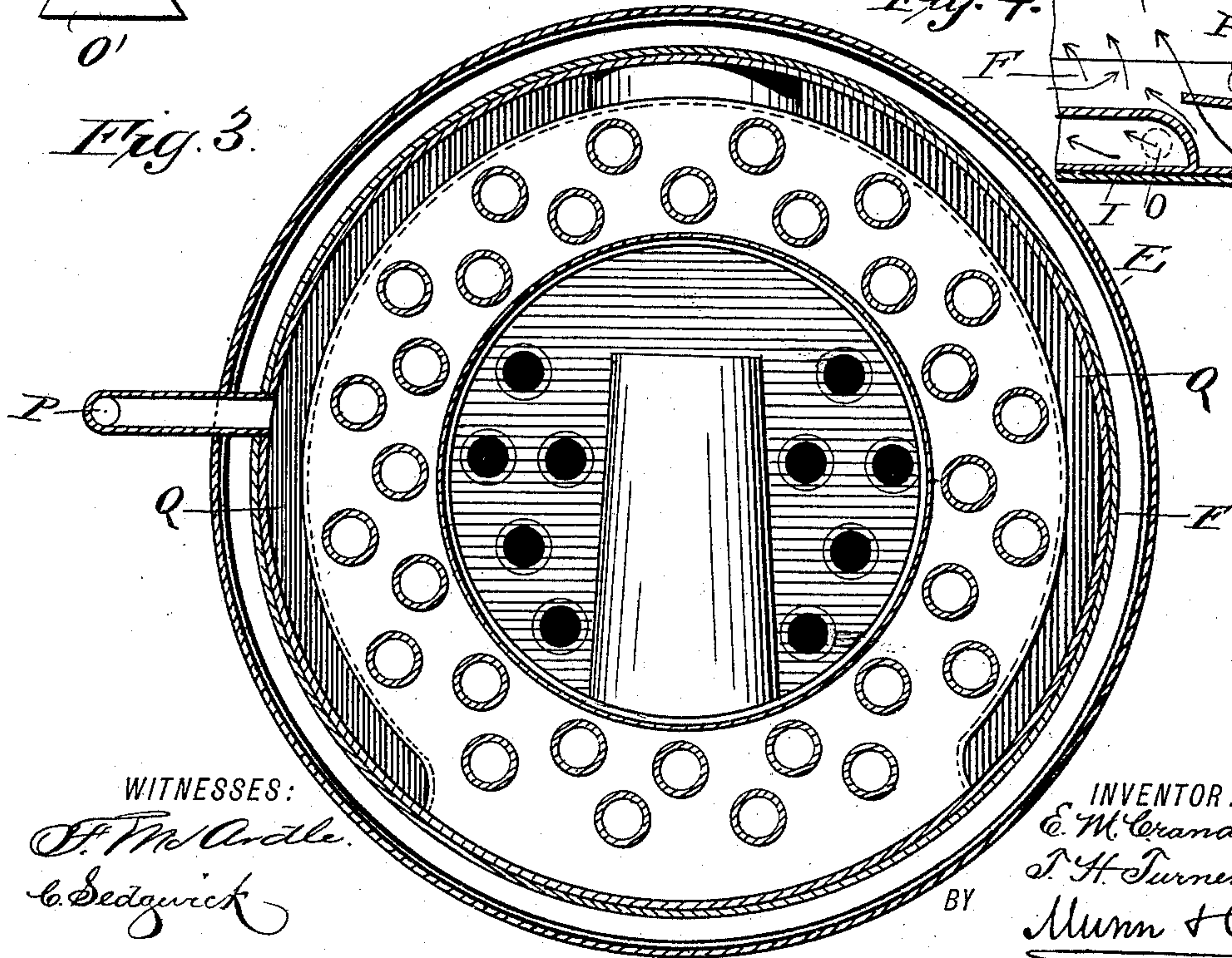
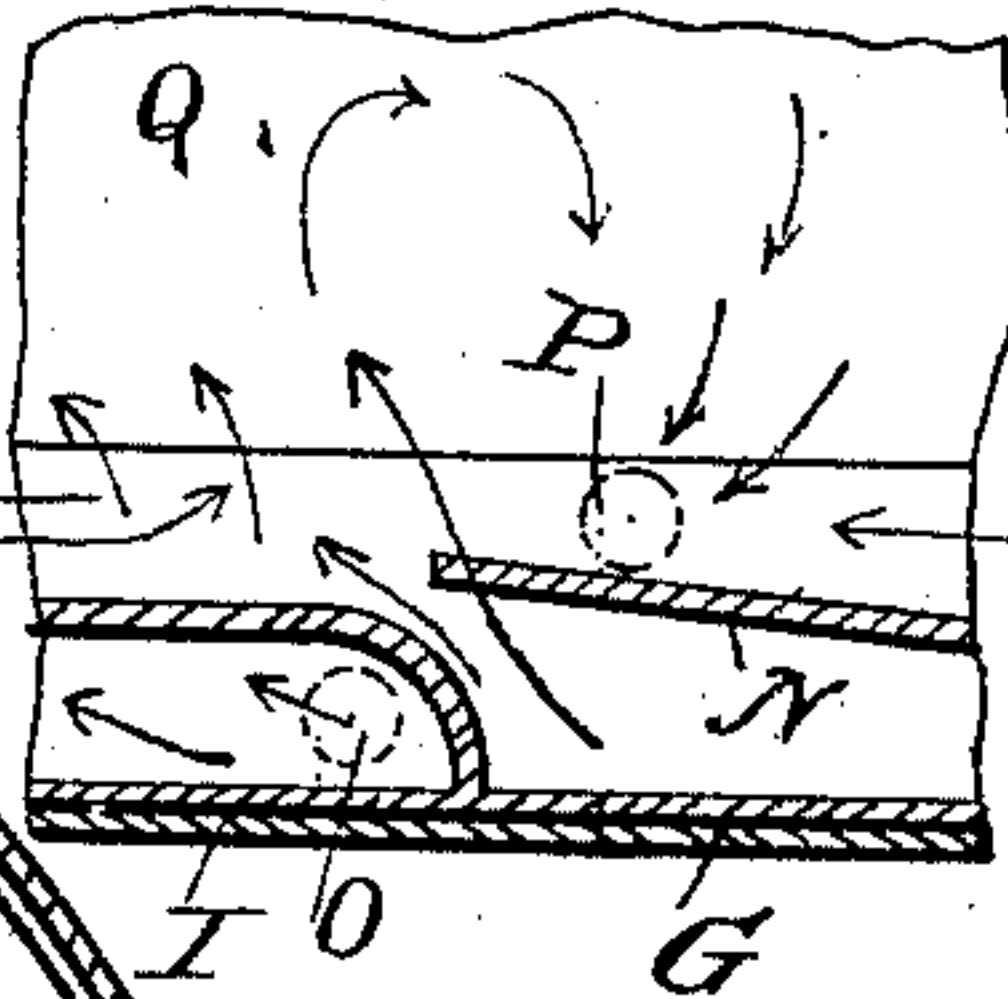


Fig. 4.



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UNITED STATES PATENT OFFICE.

EMMET M. CRANDALL AND THOMAS H. TURNER, OF ST. JOSEPH, MISSOURI.

HOT-AIR GENERATOR.

SPECIFICATION forming part of Letters Patent No. 395,813, dated January 8, 1889.

Application filed March 6, 1888. Serial No. 266,344. (No model.)

To all whom it may concern:

Be it known that we, EMMET M. CRANDALL and THOMAS H. TURNER, both of St. Joseph, in the county of Buchanan and State of Missouri, have invented a new and Improved Hot-Air Generator, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved hot-air generator specially adapted for locomotives, to furnish hot air for heating the cars of the train propelled by the locomotive.

The invention consists in certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation, parts being in section and parts being removed, of a locomotive provided with the improvement. Fig. 2 is a sectional plan view of the same on the line $x x$ of Fig. 1, the curved or bent end of the partition N being broken away to show the passage in front of the partition below said curved end. Fig. 3 is a sectional front elevation of the improvement on the line $y y$ of Fig. 2. Fig. 4 is a detail vertical longitudinal section, looking to the right, on the line $y' y'$, Fig. 2, the relative position of the pipes O and P being indicated by dotted lines, the pipe O being in front of partition N below its curved end, and the pipe P being in rear of said partition and just above its terminal end shown in dotted lines, Fig. 1.

The locomotive-boiler A is provided with the usual smoke-arch, B, into which open the boiler-flues C and the stand-pipe D in the usual manner. In the smoke-arch B is fitted the hot-air generator E, consisting, principally, of a ring-shaped hollow casing, F, fitting into the smoke-arch B near its forward wall, and being provided with a flanged front plate, G, held by its circular flange on the bolts H, which secure the dished head-plate I to the smoke-arch B. The space J is thus formed between the said dished head-plate I and the front plate, G, of the casing F. The latter is provided with a rear plate, K, through which

and through the front plate, G, pass a number of short pipes, L, opening at both ends into the smoke-arch B, so that the heat and smoke from the boiler-flues C can enter the pipes L at their inner ends and discharge into the space J, from which the heat and smoke can pass rearwardly through the center opening in the ring-shaped casing F to the center of the smoke-arch, and then up and out through the smoke-stack in the usual manner.

In the casing F is held a partition, N, having one end, N', bent so as to terminate at the front plate, G, as shown best in Figs. 2 and 4. A pipe, O, leads into the casing F near this end N' of the partition N, and the said pipe O is bent forward at its outer end, carrying at the said outer end a funnel, O', into which air passes. From the casing F at or near the other end of the partition N leads a pipe, P, which is connected in any suitable manner with the cars of the train to be heated.

From the inner or rear plate, K, of the casing F extends inward a second circular casing, Q, which leads up to the flue-plate C' of the boiler A. The interior of this extension-casing Q is in communication with the interior of the casing F in rear of the partition N, so that the air entering through the pipe O into the casing F can spread from the rear end of the latter to the casing Q and be heated by the smoke and gases in the smoke-arch and surrounding the casing Q. The latter is shaped so as to pass around the stand-pipe D, and is also provided with an opening in its top to make sufficient room for the escape of the smoke and gases to the smoke-stack of the boiler.

The operation is as follows: The casings F and Q are heated by the heat and gases passing into the smoke-arch from the boiler A. The heat and gases can pass around the said casings, and also pass through the short pipes L, so that the interior of the casing F is continually heated. The air from the outside passes into the funnel O', and then passes from the funnel O' to the pipe O and to the casing F at the front side of the partition N. The air passing into the casing F travels around in the same, and finally reaches the rear end of the partition N, so that it can spread

into the extension-casing Q, as shown in Fig. 4. The air thus entering the casings F and Q comes in contact with the heated walls of the said casings, and also with the surfaces of the pipes L, passing through the casing F, being thus heated to a high degree, and finally passes into the pipe P, which leads to the several cars to be heated.

The heated air may be forced into the cars from the pipe P by a suitable pump, fan, or other mechanism, and distributed in the several cars by suitable registers of any approved construction.

It will be seen that the hot air generated does not interfere in the least with the several parts of the locomotive located in the smoke-arch, and it takes very little space, at the same time heating the air to a very high degree.

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

1. In a hot-air generator, the combination, with a casing provided with a partition and held in the smoke-arch of a locomotive, of an air-inlet pipe provided with a funnel opening into the said casing in front of the partition, and an air-outlet pipe leading from the said casing in rear of the partition to the cars of the train, a passage through the partition being formed, substantially as shown and described.

2. In a hot-air generator, the combination, with a casing provided with a partition and located in the smoke-arch of the locomotive, of an air-inlet pipe provided with a funnel and opening into the said casing, an extension-casing connected with the said main casing, and also held in the smoke-arch of the locomotive, and an outlet-pipe leading from the inner end of the said casing at the inner end of the said partition to the cars of the train, substantially as shown and described.

3. In a hot-air generator, the combination, with a casing provided with a partition and

located in the smoke-arch of the locomotive, of an air-inlet pipe provided with a funnel and opening into the said casing, an extension-casing connected with the said main casing, and also held in the smoke-arch of the locomotive, an outlet-pipe leading from the inner end of the said casing at the inner end of the said partition to the cars of the train, and short pipes passing through the said casing for the passage of the smoke and gases from the boiler, a passage being formed between the adjacent ends of the partition, substantially as shown and described.

4. In a hot-air generator, the combination, with the smoke-arch of a locomotive, of a ring-shaped casing fitted into the said smoke-arch, pipes passing through the said casing and opening at each end into the said smoke-arch, an air-inlet pipe provided with a funnel and connected with the said casing, a partition held in the said casing, and an air-outlet pipe leading from the said casing to the cars of the train, a passage being formed between the adjacent ends of the partition, substantially as shown and described.

5. In a hot-air generator, the combination, with a smoke-arch of a locomotive, of a ring-shaped casing fitted into the said smoke-arch, pipes passing through the said casing and opening at each end into the said smoke-arch, an air-inlet pipe provided with a funnel and connected with the said casing, a spiral partition held in the said casing, an air-outlet pipe leading from the said casing to the cars of the train, and an extension-casing extending from the rear of the said main casing into the smoke-arch and being in communication with the said main casing, substantially as shown and described.

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Witnesses:

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