No. 748,325. PATENTED DEC. 29, 1903.

W. B. WARREN.

DRAFT APPLIANCE FOR LOCOMOTIVE BOILERS.

APPLICATION FILED AUG. 29, 1903.

NO MODEL.

Fig. II.

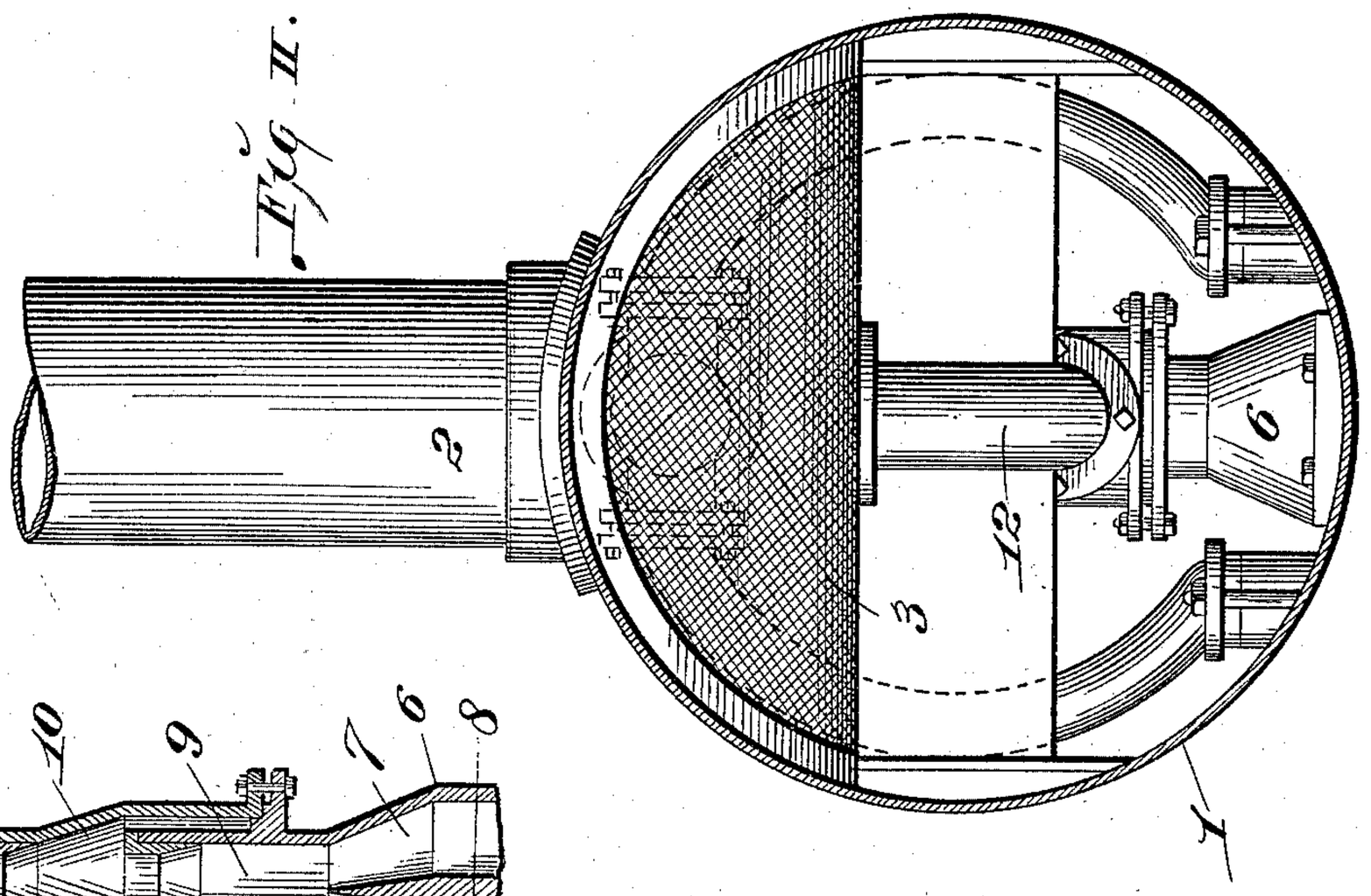


Fig. III.

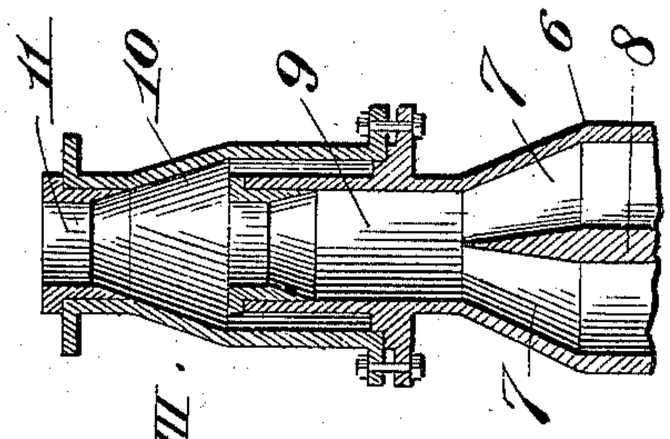
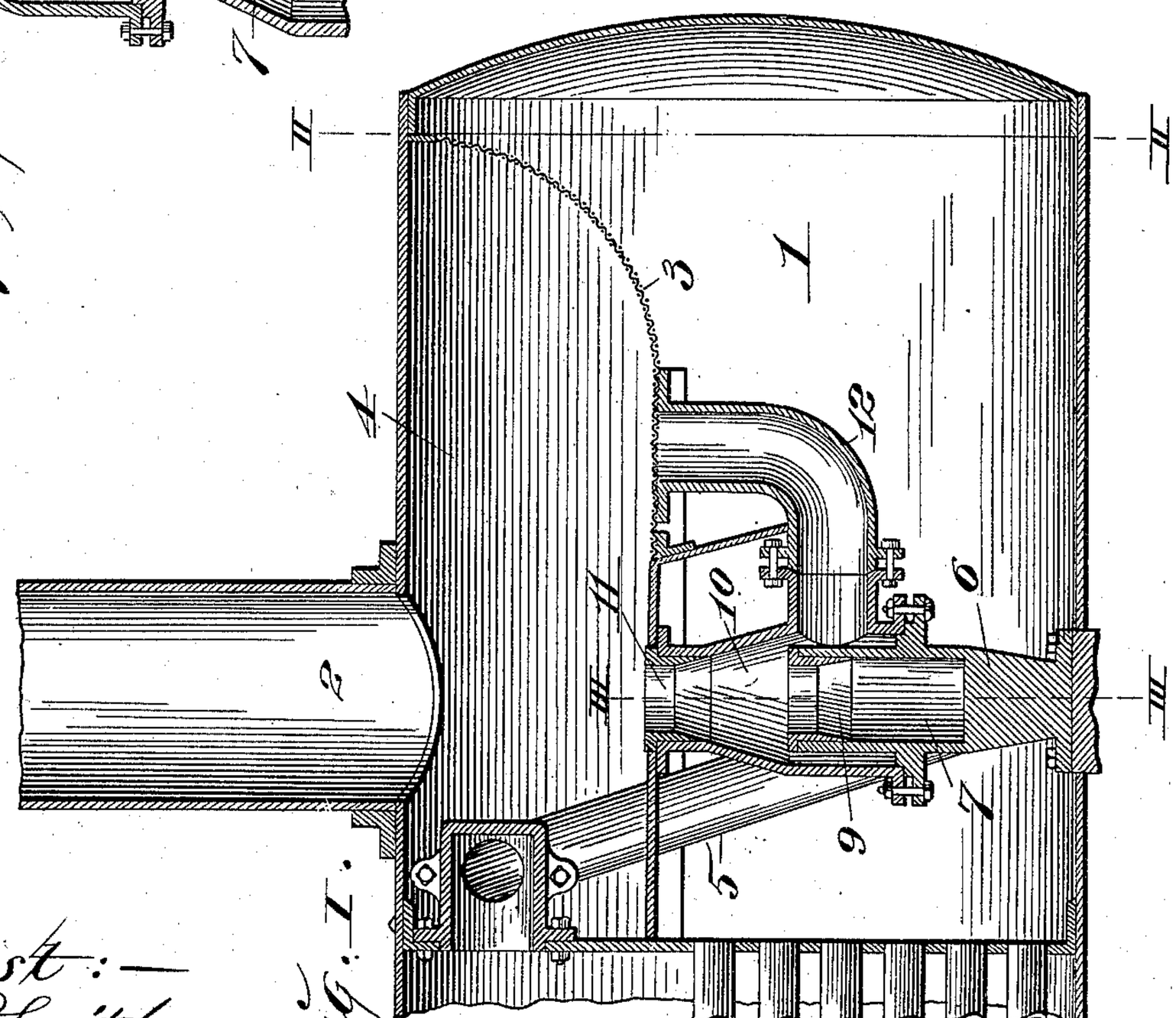


Fig. I.



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No. 748,325. Patented December 29, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM B. WARREN, OF ST. LOUIS, MISSOURI.

DRAFT APPLIANCE FOR LOCOMOTIVE-BOILERS.

SPECIFICATION forming part of Letters Patent No. 748,325, dated December 29, 1903.

Application filed August 29, 1903. Serial No. 171,237. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. WARREN, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Draft Appliances for Locomotive-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The invention relates to an improvement on the draft appliance shown and described in Letters Patent issued to me May 16, 1899, No. 625,225.

The present invention has reference to a construction whereby hot air from the smoke-arch of the boiler is delivered into a mixing-chamber to be combined with steam as distinguished from the construction shown in said patent in which fresh air from the exterior of the boiler is communicated to said mixing-chamber.

By the use of hot air in my draft appliance I obtain greater efficiency in the appliance, due to better draft being afforded when steam has heated air mixed therewith instead of cold fresh air.

The invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a vertical longitudinal section taken through the head end of the locomotive-boiler with my improved draft appliance situated therein. Fig. II is a vertical cross-section taken on line II II, Fig. I, through the boiler with my draft appliance shown in front elevation. Fig. III is a vertical section taken on line III III, Fig. I.

1 designates a boiler of any common form which is surmounted by a smoke-stack 2. Within the boiler is the usual spark-arrester screen 3, above which is a smoke-arch 4.

5 designates live-steam pipes which have communication with the steam-space in the boiler and lead to the engine-cylinders. (Not shown.)

6 is a steam-box located in the boiler 1 beneath the smoke-stack 2 and in line therewith. In this steam-box are two passage-ways 7, that are separated by a partition 8 and have communication with exhaust-steam pipes leading from the engine-cylinders, (not shown,) through which the exhaust-steam from said cylinders may be conveyed to the steam-box and pass into a single conduit 9, (see Fig. III,) that empties into a mixing-chamber 10, which is provided with an outlet 11. The upper outlet end of the mixing-chamber extends to the spark-arrester screen 3, so that the discharge from said mixing-chamber will occur above the screen. The parts of my appliance thus far described are similar in construction to those shown in my Letters Patent hereinbefore referred to.

12 designates a hot-air-conducting pipe leading from the spark-arrester screen to the mixing-chamber 10, as seen most clearly in Fig. I. This hot-air-conducting pipe has communication with the smoke-arch 4 to receive heated air therefrom which passes through the screen 3 and is conducted to the mixing-chamber 10. Exhaust-steam from the engine-cylinders is conducted to the steam-box 6 and flowing through the passage-ways therein is delivered to the mixing-chamber 10, to mingle with the hot-air conveyed thereto from the conducting-pipe 12. Suction within the mixing-chamber is thereby created and the hot air and gases rising to the smoke-arch 4 are forcibly drawn through the conducting-pipe 12 into the mixing-chamber, where they are combined with the steam, and the mixture is blown through the outlet 11 vertically across the smoke-arch and into the boiler smoke-stack to intensify the draft.

By providing for the use of hot air to be mixed with the steam in the draft appliance I avoid lowering of the temperature of the steam, such as would occur by the communication of cool fresh air into the mixing-chamber by the draft appliance to mix with the steam, and therefore gain greater efficiency of blast into the smoke-stack of the boiler.

I claim as my invention—

1. In a draft appliance, the combination with the smoke-arch, and smoke-stack of a boiler, of a spark-arrester screen mounted in the upper part of the smoke-arch, a steam-box mounted beneath the spark-arrester screen, a mixing-chamber extending from the steam-box to the smoke-arch to a point above the spark-arrester screen and below the smoke-stack, and an air-conducting pipe leading downwardly from the spark-arresting

screen to that part of the mixing-chamber surrounding the steam-box.

2. In a draft appliance, the combination with the smoke-arch and the smoke-stack of the boiler, of a spark-arrester screen mounted in the upper part of the smoke-arch, a steam-box mounted beneath the spark-arrester screen, a mixing-chamber secured near one end to the spark-arrester screen below the smoke-stack and surrounding the steam-box at its other end, and an air-conducting pipe secured to the under side of the spark-arresting screen and to the mixing-chamber at the end which surrounds the steam-box.

WILLIAM B. WARREN.

In presence of—
E. S. KNIGHT,
BLANCHE HOGAN.