(No Model.) 2 Sheets—Sheet 1.

C. M. ARMSTRONG.

SMOKE CONSUMER.

No. 570,533. Patented Nov. 3, 1896.

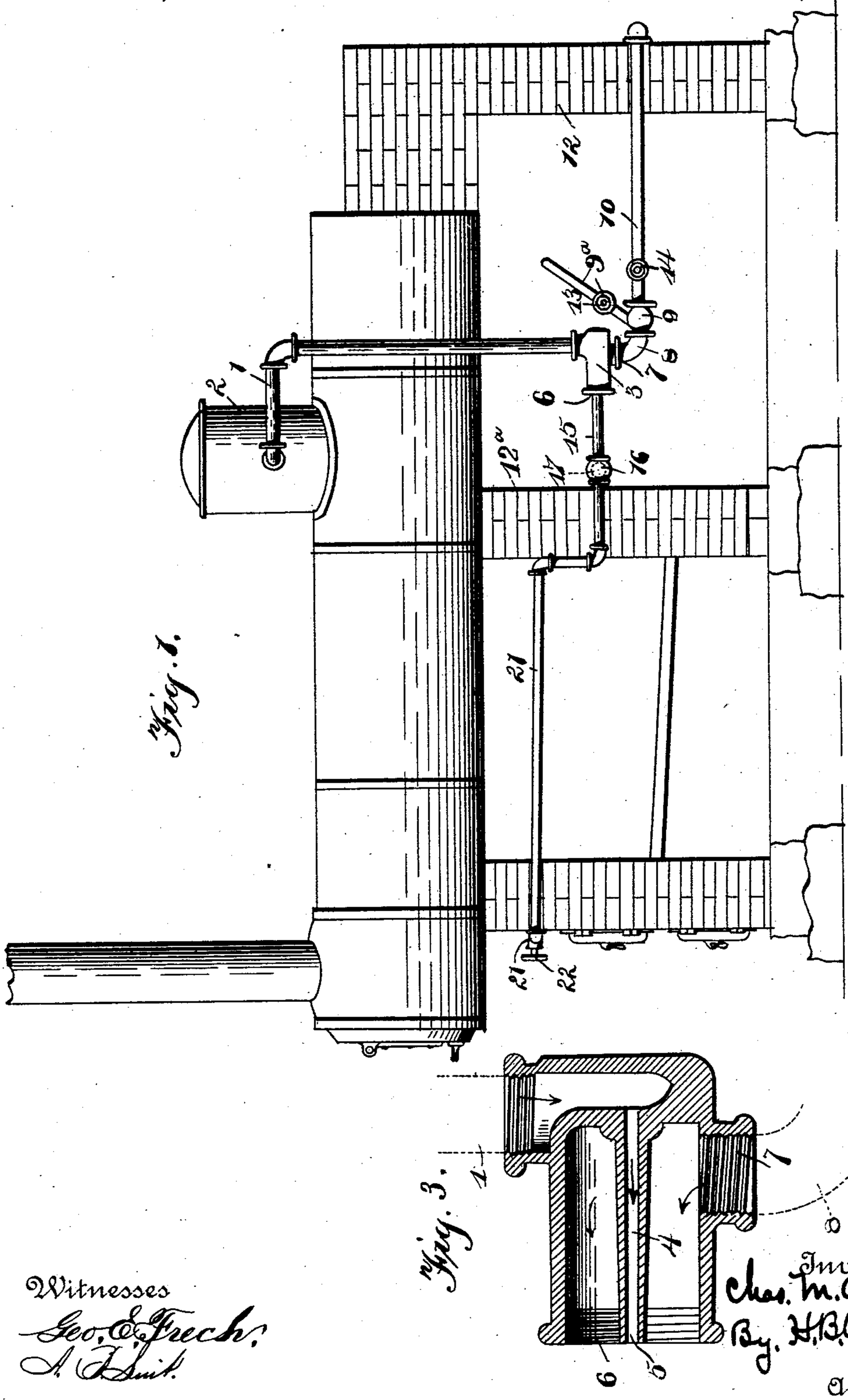

Fig. 1.

Fig. 3.

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(No Model.)

2 Sheets—Sheet 2.

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No. 570,533. Patented Nov. 3, 1896.

Fig. 2.

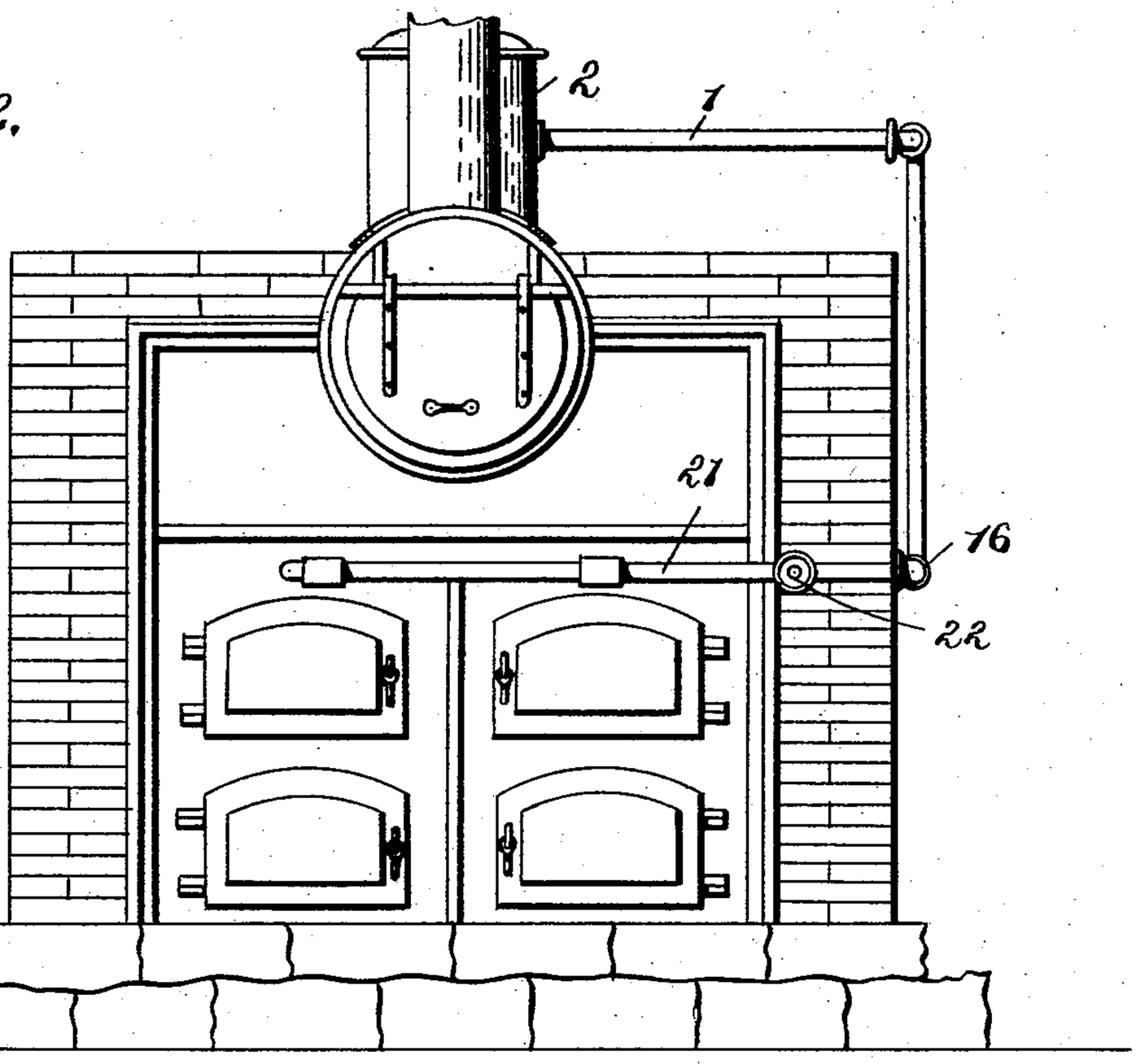


Fig. 4.

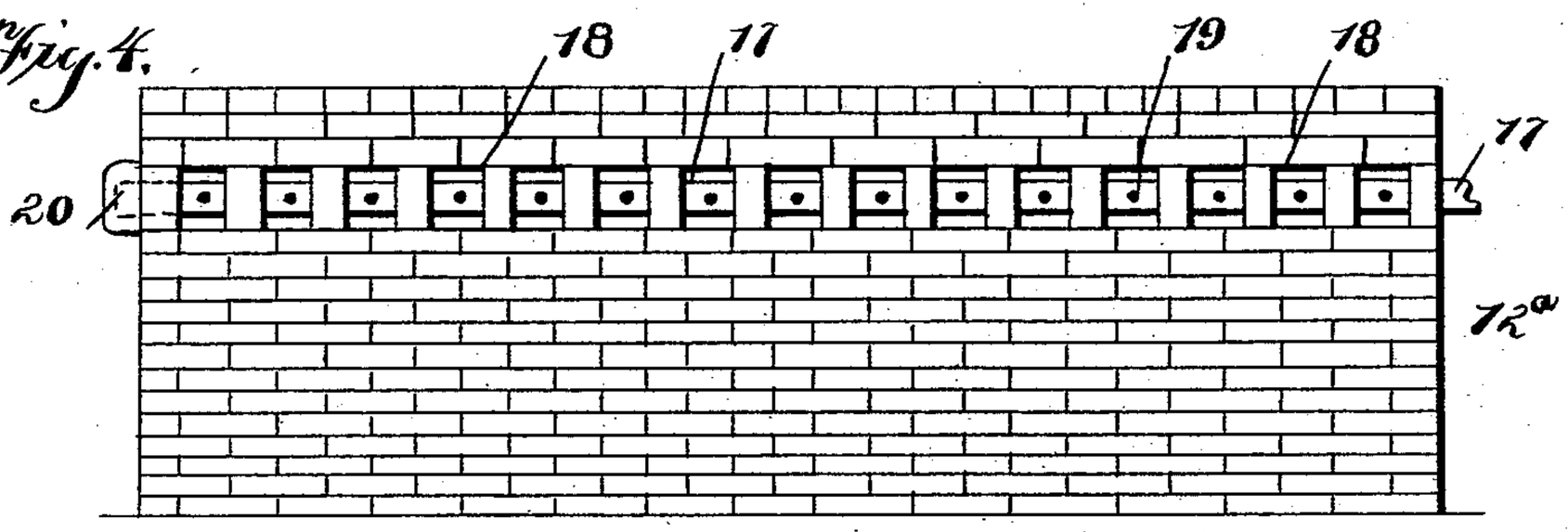
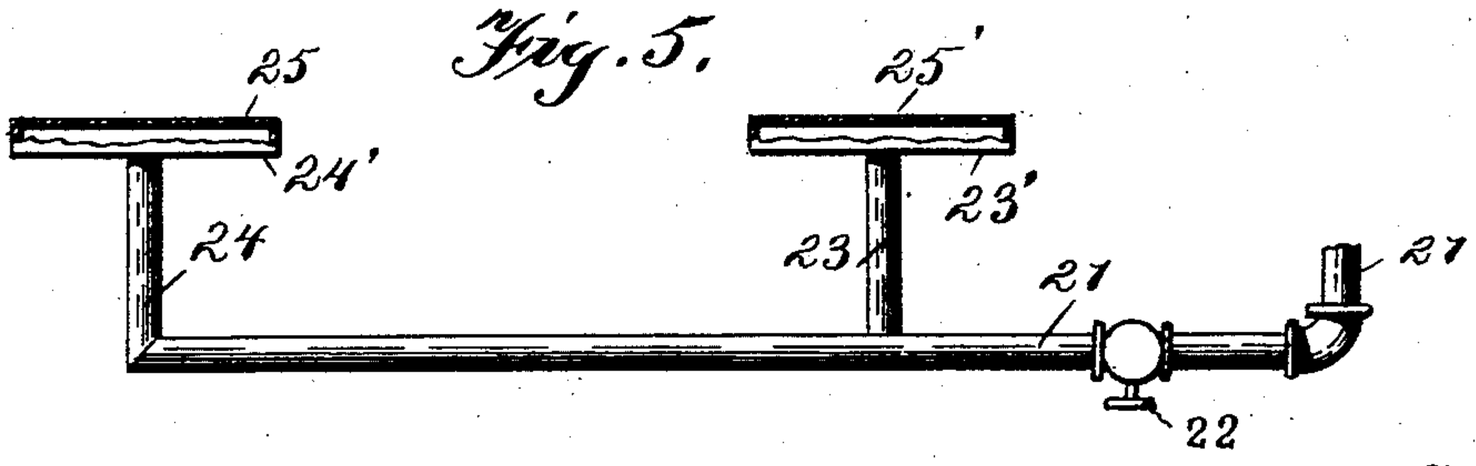


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES M. ARMSTRONG, OF BARRY, ILLINOIS, ASSIGNOR OF ONE-HALF TO JOHN WEBER AND JOHN DAY, OF SAME PLACE.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 570,533, dated November 3, 1896.

Application filed July 18, 1896. Serial No. 599,694. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. ARMSTRONG, a citizen of the United States, residing at Barry, in the county of Pike and State of Illinois, have invented certain new and useful Improvements in a Combined Smoke-Consumer and Spark-Arrester; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has relation to improvements in smoke-consumers and spark-arresters combined; and the object is to provide a simple and effective device for this purpose.

To this end the novelty consists in the construction, combination, and arrangement of the same, as will be hereinafter more fully described, and particularly pointed out in the claim.

In the accompanying drawings the same figures of reference indicate the same parts of the invention.

Figure 1 is a side elevation of an ordinary return-flue boiler and furnace provided with my improved smoke-consumer and spark-arrester. Fig. 2 is a longitudinal section of the same. Fig. 3 is a longitudinal section of one of the ejector-nozzles. Fig. 4 is a front view on the line of the bridge-wall, and Fig. 5 is a detail of the feed-pipe in front of the furnace.

1 represents a pipe, of suitable size, leading from the steam-dome 2 of the boiler down to and communicating with a coupling 3, having an interior passage 4, terminating in an ejector-jet 5, formed integral with the coupling. This coupling is also formed with a screw-threaded outlet 6, surrounding the jet 5, and a screw-threaded inlet 7, to which is connected a pipe 8, the end of which is provided with a coupling 9, from which a pipe 9^a, provided with a valve 13, opens into the atmosphere. A second pipe 10, having a valve 14, is also connected to said coupling 9, and its opposite end extends back of the wall 12, where it communicates with the combustion-chamber. These pipes 9^a and 10 are each provided with a valve 13 14, by means of which ordinary air or the gases arising from the products of combustion, or both combined in suitable proportions, may be discharged at the outlet 6.

15 is a short pipe connecting the outlet 6 with a T-coupling 16, from which a branch pipe 17 runs along the back of the bridge-wall 12^a, which is formed with a series of openings 18, extending through it from back to front and in line with a series of openings or orifices 19 in the branch pipe 17, the inner end of which is closed with a cap 20.

21 is a pipe connected to the T-coupling 16, and it extends around the side of the furnace and across the front thereof above the furnace-doors. It is provided with a convenient hand-valve 22, and two branch pipes 23 24 extend from it into the furnace, their inner ends terminating in short cross-pipes 23′ and 24′, which are provided with a series of perforations 25, through which the mixed steam and air or gases may be discharged into the furnace.

The operation is as follows: When the valve 22 is open and the valves 13 14 closed, the live steam is admitted to the furnace, and if the valve 13 be now opened a mixture of steam and atmospheric air will be admitted, and if the valve 13 be closed and the valve 14 opened the gases arising from the combustion will be injected along with the steam, while if the valves 13 and 14 be both opened the mixed gases will consist of steam, atmospheric air, and the gases arising from combustion, and by means of the valves the proportions of each may be so adjusted as to accomplish the desired results.

Having thus fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

The combination with the pipe 1, communicating with the steam-dome of the boiler and connecting to the coupling 3, formed with an integral ejector-jet 5 and an outlet 6, the pipe 8, having a coupling 9, provided with a pipe 9^a having valve 13, and opening into the atmosphere, and a pipe 10 having valve 14 communicating with the combus-

tion-chamber, the T-coupling 16 connected to the coupling 3 by a pipe 15 and provided with the branch pipe closed at its inner end and having a series of perforations or orifices 19 in line with the openings 18 in the bridge-wall, and a pipe 21 connected to said T-coupling and provided with branch pipes 23 24, and the cross-pipes 23′ 24′ extending into the front of the furnace, substantially as shown and described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

CHAS. M. ARMSTRONG.

Witnesses:
W. I. KLEIN,
C. W. GOODALE.