

No. 708,851.

Patented Sept. 9, 1902.

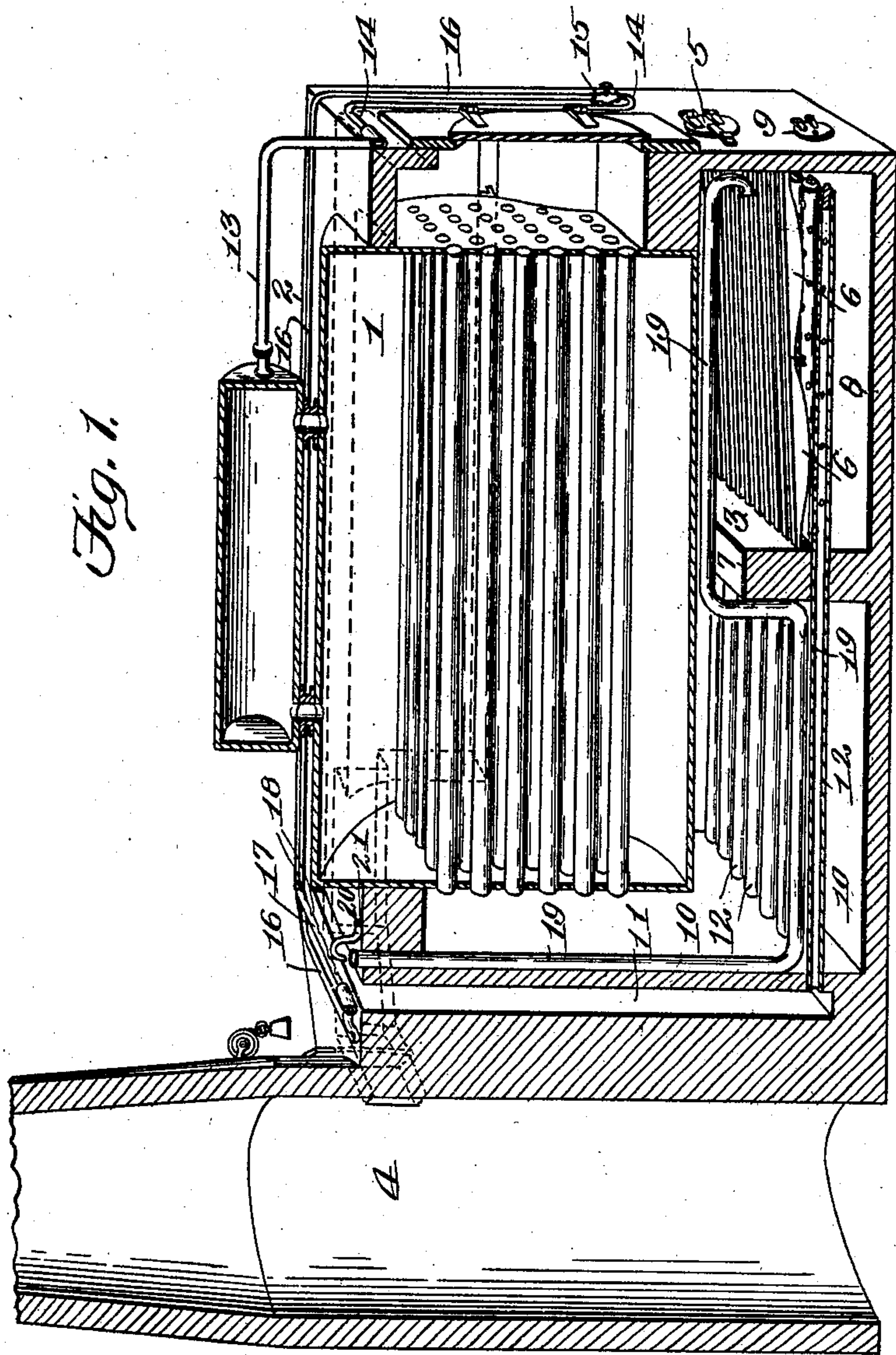
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AIR FEEDING APPARATUS FOR FURNACES.

(Application filed Nov. 6, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
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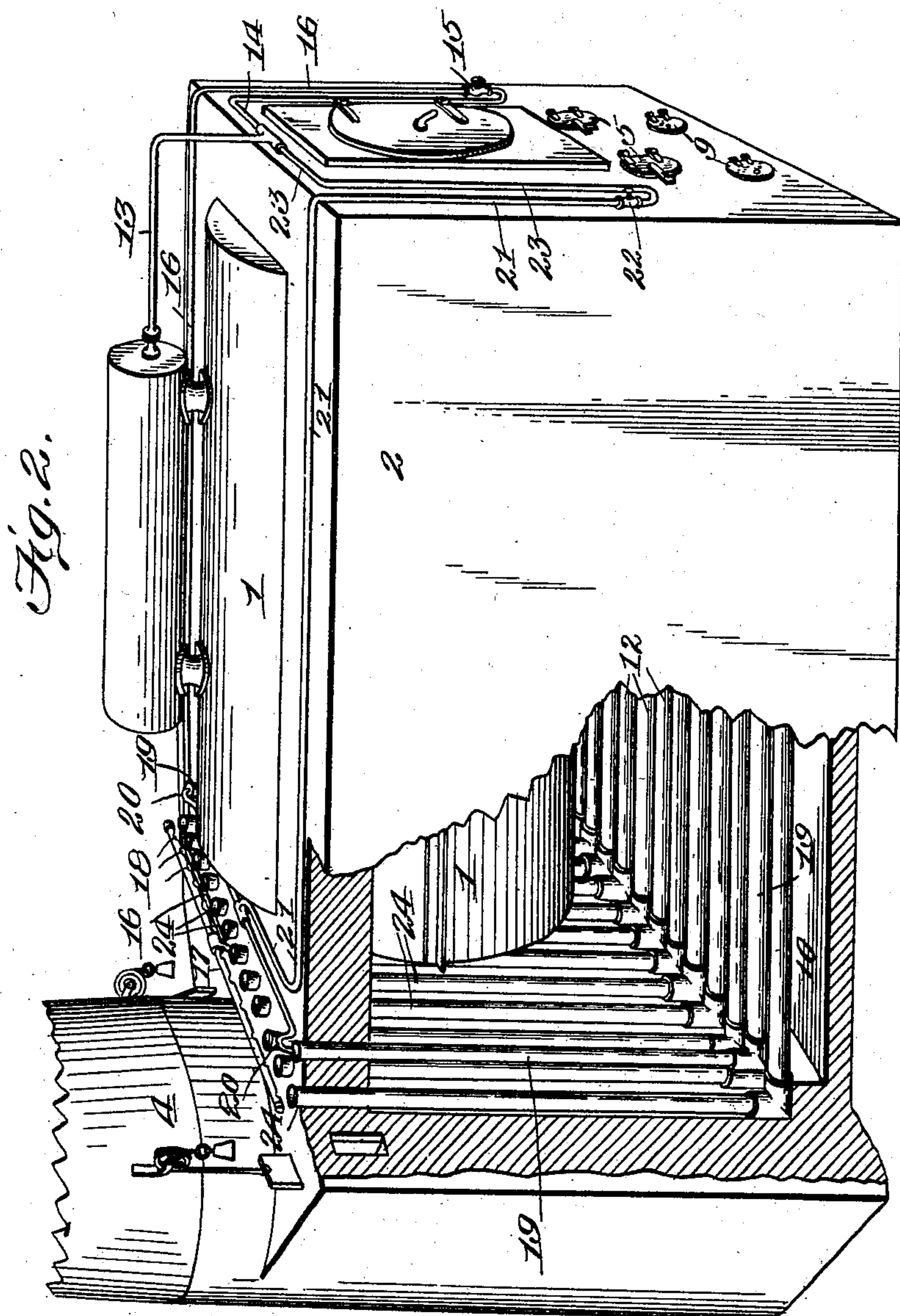
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UNITED STATES PATENT OFFICE.

HERBERT ABBOTT, OF BALMAIN, NEAR SYDNEY, NEW SOUTH WALES,
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AIR-FEEDING APPARATUS FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 708,851, dated September 9, 1902.

Application filed November 6, 1901. Serial No. 81,357. (No model.)

To all whom it may concern:

Be it known that I, HERBERT ABBOTT, engineer, a subject of the King of Great Britain, residing at No. 6 Wharf road, Balmain, near Sydney, in the State of New South Wales and Commonwealth of Australia, have invented new and useful Improvements in or Relating to Air-Feeding Apparatus for Furnaces, of which the following is a specification.

10 This invention relates to air-feeding apparatus for furnaces which have a brickwork setting, though it may be applied to other furnaces which have what are termed "combustion-chambers," through which may pass
15 a passage or pipes direct from air to the ash-pit and furnace, and it has been devised particularly that thorough combustion will take place in the furnace, and so prevent the emission of smoke; but in order that this invention may be clearly understood reference will
20 now be made to the drawings herewith.

Figure 1 is a central sectional view in perspective of a steam-boiler and its setting, to which is applied the present invention. Fig.
25 2 is a similar view in which parts of this invention are of modified construction.

The boiler 1 is set in brickwork 2, with suitable flues leading from the furnace 3 to the chimney 4, and has all necessary connections,
30 well understood and therefore not illustrated. The furnace 3 has feeding-doors 5, fire-bars 6, and fire-bridge 7, while its ash-pit 8 is closed or air-tight and has cleaning-out doors 9.

35 In the construction shown in Fig. 1 at the back of the chamber 10 (usually called the "combustion-chamber") and with as thin a partition as practicable is a downtake-passage 11. From the bottom of this passage a
40 series of pipes 12 lead along the bottom of said chamber 10 through the bridge 7 to close under the fire-bars 6, where they have three rows of perforations. From the steam-chamber a steam-pipe 13 leads to the front of the
45 boiler and has a branch 14, provided at a convenient position with a regulating-valve 15. From this valve a pipe 16 returns to the cross-pipe 17 above the downtake 11. This cross-pipe 17 has a series of perforations 18 (or may
50 have a series of nozzles) at the mouth of the downtake. It will be seen that steam being

allowed by manipulation of the valve 15 to escape or blow into the downtake 11 air will be sucked therein and a strong draft created. The air, thoroughly heated in its passage
55 through downtake 11 and pipes 12, will thus be discharged under the fire-bars 6 and passing through them will promote most effective combustion and practically prevent or nearly prevent the emission of smoke from the fuel. 60
As an additional precaution a pipe or pipes, (if preferred, made of fire-clay,) only one being shown as used in Fig. 1 and marked 19, passes downwardly through chamber 10 over
65 the bridge 7 into the furnace 3 above the fire-bars 6 and has bell-mouth pointing forwardly. A jet 20 is set above the mouth of this pipe 19, steam being conducted thereto by pipe 21
70 from a regulating-valve 22 on a branch 23 from the pipe 13. Steam is always more or less fully supplied to the jet 20, so that air will always be passing through pipe 19 to
75 keep it cool and at the same time supply the heated air forced through such pipe 19 by said steam-jet 20 to above the fire on the bars 6, so as to promote combustion and more effectively burn up all combustible particles
given off by the fire.

In the modification illustrated in Fig. 2 instead of the downtake 11 being a passage
80 through the setting it consists of a series of pipes (if preferred, made of refractory material) 24. The pipes 19 (with steam-jets 20) and extensions are in duplicate, one in each
85 corner of the chamber 10. All the other parts are identical with those hereinbefore described and are marked with similar figures of reference. The functions of the various parts and the operation of the whole of this
90 modification will be readily understood from the foregoing description with reference to Fig. 1.

It is to be understood that though it is admitted that the integers making up these present improvements are of themselves separately not new, yet the new combination of
95 them as a whole now invented achieves in a more efficient and practical manner the prevention of the emission of smoke from the chimneys of such steam-generators as those
100 set forth.

Having now particularly described and as-

certained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination of a furnace having an
5 upright passage opening at its upper end into the atmosphere, a pipe connected with the lower end of said passage and extending forwardly therefrom, its forward end being situated under the grate and having a series of
10 openings, an upright pipe substantially coextensive with said passage, the lower end of the pipe being provided with a forwardly-extending portion substantially coextensive with said other pipe and its forward or delivery end being situated above the grate,
15 and means for delivering steam into the upper ends of said upright passage and upright pipe, respectively.

2. The combination of a furnace having
20 brickwork, said brickwork being provided with a downtake-passage opening into the atmosphere at its upper end, a plurality of pipes leading from the downtake-passage and extending forwardly therefrom, the forward
25 ends of the pipes having openings for the discharge of air and steam at one side of the grate of said furnace, means for delivering steam into the upper open end of said down-

take-passage, a pipe substantially coextensive with the downtake-passage and its upper
30 end opening into the atmosphere, said pipe having a forwardly-extending portion, the end of which is arranged to discharge steam and air into the grate-chamber at the side of the grate opposite to that into which the air and
35 steam from the first-mentioned pipes are delivered, and means for delivering steam into the upper open end of said pipe.

3. The combination of a furnace provided with a boiler and a steam-chamber, a vertical
40 passage opening into the atmosphere, and having a conduit extending forwardly from the same, and arranged to deliver air and steam into the grate-chamber of said furnace, and a system of valved piping arranged to deliver
45 steam into the upper open end of said passage, and connected with said steam-chamber.

In testimony whereof I have signed my name to this specification in the presence of
50 two subscribing witnesses.

HERBERT ABBOTT.

Witnesses:

FRED WALSH,

PERCY NEWELL.