

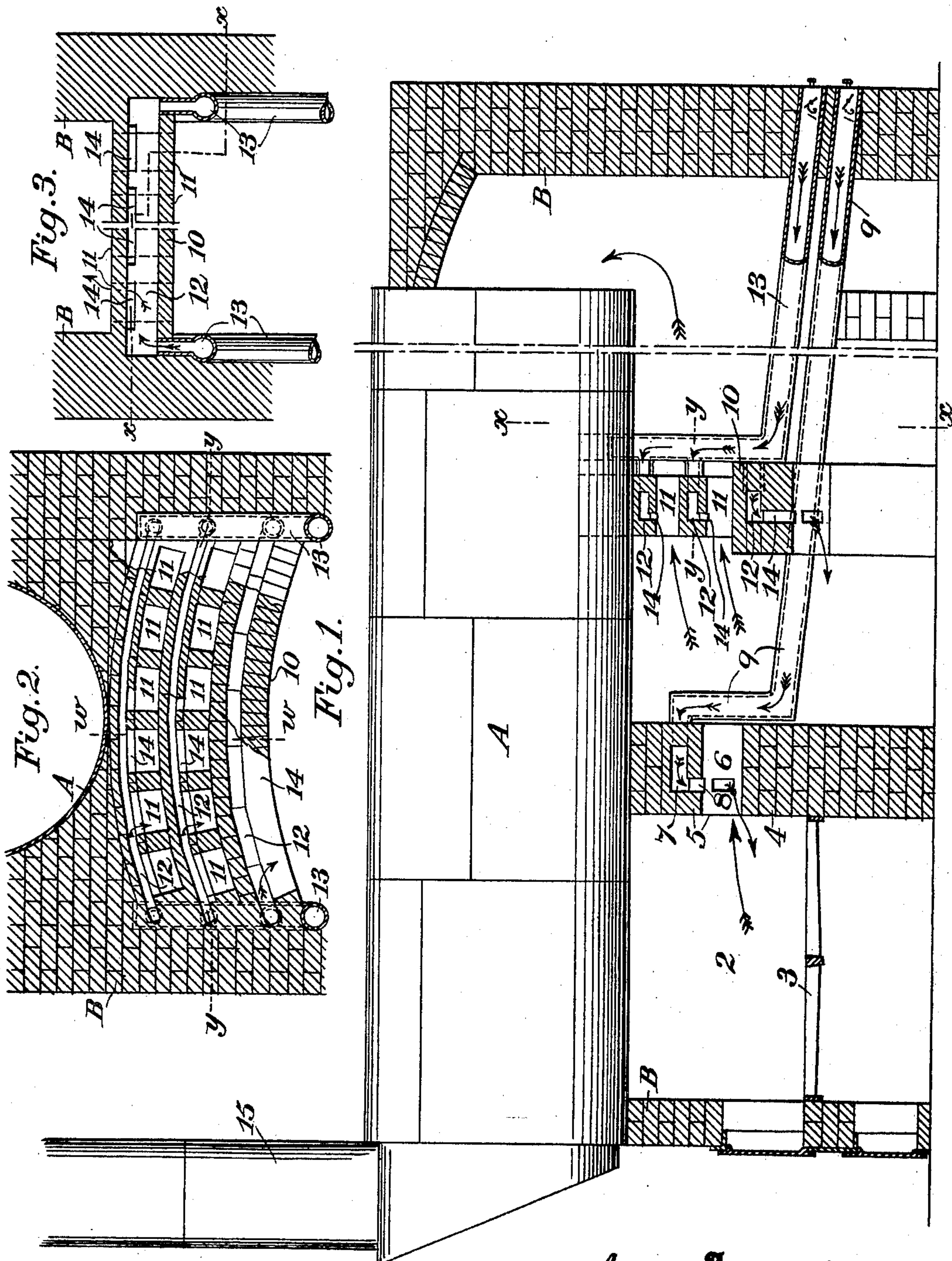
No. 697,085.

Patented Apr. 8, 1902.

J. H. HOBART.
SMOKE PREVENTER.

(Application filed July 9, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

JOHN H. HOBART, OF DENVER, COLORADO.

SMOKE-PREVENTER.

SPECIFICATION forming part of Letters Patent No. 697,085, dated April 8, 1902.

Application filed July 9, 1901. Serial No. 67,581. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. HOBART, a citizen of the United States, residing at Denver, county of Arapahoe, State of Colorado, have
5 invented an Improvement in Smoke-Preventers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which
10 is especially designed for the prevention or consumption of smoke which may be introduced by the combustion of fuel in the furnace and to prevent the smoke from escaping into the open air.

15 It consists of a furnace having a bridge-wall at the rear and beneath the boiler, with double arches forming an intermediate passage for the products of combustion and means for supplying air to produce a draft transversely
20 to the movement of the products of combustion through said passage, a second wall having pigeonhole-openings therethrough located in the rear of the bridge-wall, with means for supplying air into passages above the openings, and openings by which the air is delivered
25 downwardly into each of said pigeonholes and transversely to the line of movement of the products of combustion.

My invention also comprises details of construction, which will be more fully explained
30 by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional elevation on the line *ww* of Fig. 2. Fig. 2 is a
35 transverse section on the line *xx* of Figs. 1 and 3. Fig. 3 is a horizontal section on the line *yy* of Figs. 1 and 2.

My invention is especially designed to prevent the formation of or to consume smoke
40 and carbonaceous products of combustion which arise within a boiler or other furnace and to prevent such products escaping into the open air in a visible or deleterious form.

My present invention is shown as applied
45 to a boiler set in brickwork and of the form known as "stationary" boiler; but it may be used in conjunction with other descriptions of boilers or furnaces without materially altering the character of my invention.

50 As here shown, A is a boiler set in brickwork, as shown at B.

2 is the furnace or fuel-space, and 3 the grate-bars of the furnace.

At the rear of the furnace is the bridge-wall 4, and above this wall is an arch 5, forming
55 with the bridge-wall a space 6, through which the products of combustion pass into the space beneath the central portion of the boiler. Within the arch 5 is a chamber or chambers, as at 7, and 8 represents downwardly-extend-
60 ing openings connecting said chamber with the space 6 and transversely to the line of travel through 6.

9 represents one or more pipes or passages opening at any convenient point for the in-
65 gress of air. In the present case I have shown these passages opening through the brickwork B at what would be the rear of a boiler of this construction, and, passing through the rear combustion-chamber of the furnace, the
70 air would commence to be heated, the heat continually increasing as it goes on up to the point when it enters the chamber 7, where it is subjected to all the heat of the passing products of combustion. This highly-heated air
75 is then delivered into the passage 6 at as many points as may be desired, and thus furnishing fresh oxygen to mingle with the unconsumed products of combustion at this point the combustion will be carried on by the fresh
80 access of oxygen.

At the rear and at some point between the bridge-wall and the rear combustion-chamber of the boiler or its furnace is located a
85 second wall 10. This wall extends entirely across between the side walls of the space beneath the boiler, the upper part fitting closely against the boiler, and the wall extends down approximately to the bottom of the space beneath the boiler. Through this wall is made
90 a series of "pigeonhole-openings," so called, as shown at 11. These openings are arranged in a series of arches, as here shown, and between each of these series of arches are chambers 12, into which air is conducted from an
95 inlet pipe or pipes 13. These pipes or passages extend from the rear of the structure in the same manner as the pipes shown at 9 and are carried up so as to deliver the air into the intermediate chambers 12, where it is suffi-
100 ciently heated, and from these chambers the air may be delivered downwardly through

suitable passages, as 14, into the pigeonhole-flues 11, there heating the products of combustion and transversely to their line of travel. This fresh accession of heated air
 5 continues the combustion and finally consumes any unconsumed portion of carbon or other product which reaches this point, so that the gases escaping through the pigeonholes will pass through beneath the boiler,
 10 returning thence through the usual return-flues to the smoke-stack or uptake 15, and gases escaping from this stack will show little or no discoloration or deleterious matter.

The main air-supply pipes 9 and 13 may be
 15 provided with controlling gates or dampers, as at 16. The pipes extend along each side and interior to the side walls of the combustion-chamber, where they will be exposed to the heat without obstructing the passage of
 20 the products of combustion, and they are turned upward just behind the walls 4 and 10 and have branches opening into each of the heating-chambers of their respective arches.

Having thus described my invention, what
 25 I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a boiler, the fire-box thereof and a bridge-wall at the rear of the fire-box, of an arch fitted above the bridge-wall having an internal chamber, connections
 30 made between said chamber and the heat-passage below the arch, means for supplying air into the chamber within the arch, a second arch located at the rear of the bridge-wall having pigeonhole therethrough, and a
 35 heating-chamber formed above said passages, with connections from the chambers into the passages, and means for supplying air into said chamber.

2. The combination in a boiler, the fire-box
 40 bridge-wall and rear combustion-chamber thereof, of a plurality of arches located beneath the boiler, one in rear of the other, a passage for the products of combustion between the bridge-wall and the first arch, a
 45 heating-chamber in the upper part of said arch and means for supplying air thereto, passages leading downwardly from said chamber, discharging air to mingle with the prod-
 50 ucts of combustion in the space beneath the

arch, a plurality of openings through the rear-most arch with corresponding heating-chambers above each series, air-supply passages connecting with said heating-chambers and passages delivering air from the chambers
 55 into the heat-passages below.

3. A boiler-furnace including a plurality of bridge-walls located at different distances from the fire-box, an arch above each of said walls and forming between itself and the wall
 60 a passage for products of combustion, heating-chambers formed in the upper portions of the arches and passages leading from said chambers and discharging air to mingle with the products of combustion, and separate air-
 65 inlet passages connecting through openings in the rear walls of the arches.

4. A boiler-furnace including a grate, a rear combustion-chamber, a plurality of walls between said grate and chamber, an arch above
 70 each wall and forming between itself and the wall a passage for the products of combustion, one of said walls having contracted openings through it, heating-chambers in the upper portions of the arches and passages leading
 75 from the chambers and discharging air into the smoke-passages to mingle with the products of combustion, and air-pipes having ends upturned and located back of each wall and communicating with the heating-chambers
 80 therein.

5. A boiler-furnace having a grate, and a rear combustion-chamber, transverse walls between the grate and the rear end, arches
 85 above the walls and separated therefrom to form a passage for products of combustion, air-chambers within the arches and branches communicating with the passages there-through, pipes extending along the inner side walls of the rear chamber, and upturned at
 90 the rear of the transverse walls, said pipes having connections with each of the air-chambers.

In witness whereof I have hereunto set my hand.

JOHN H. HOBART.

Witnesses.

JESSE P. JAMES,

FRANK E. ROBINSON.