

(No Model.)

J. W. WILKINSON.
BOILER FURNACE.

No. 478,210.

Patented July 5, 1892.

Fig. 1.

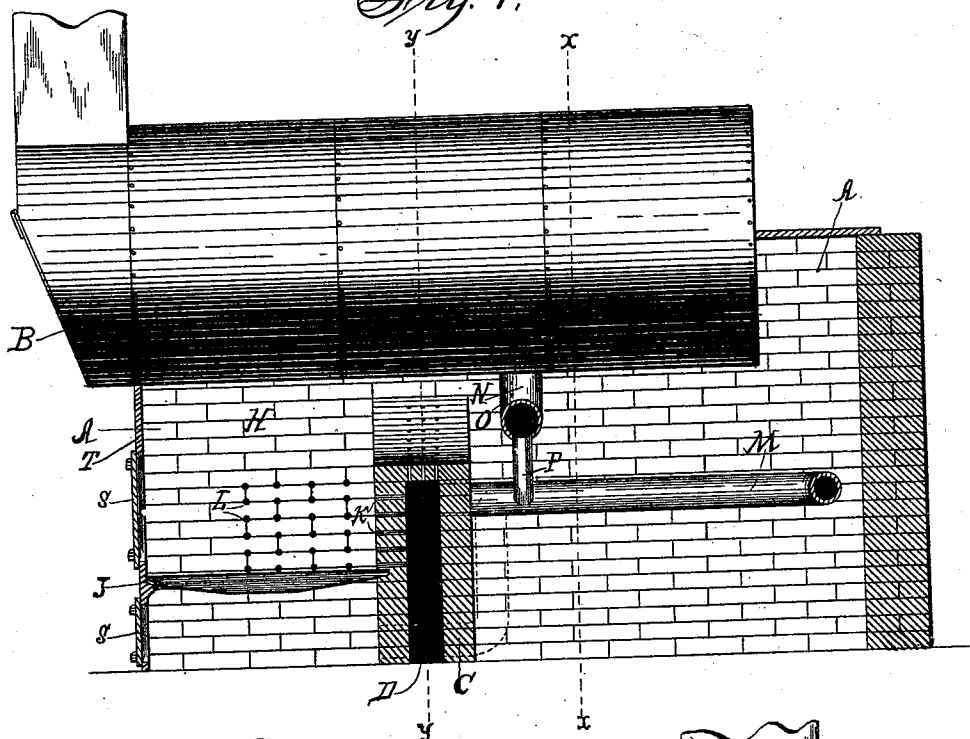


Fig. 2.

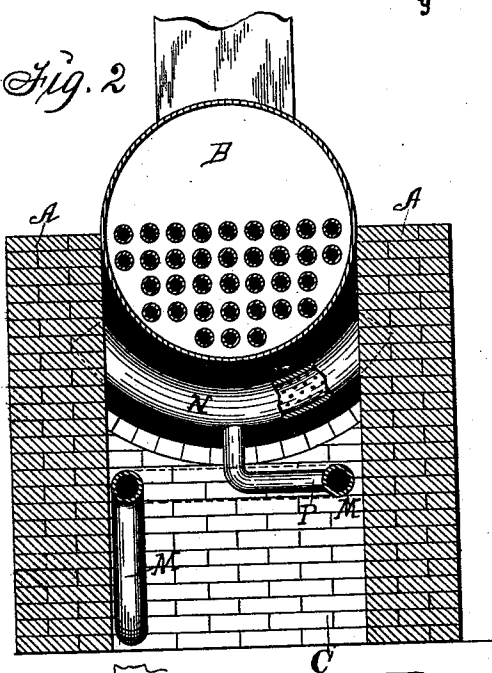
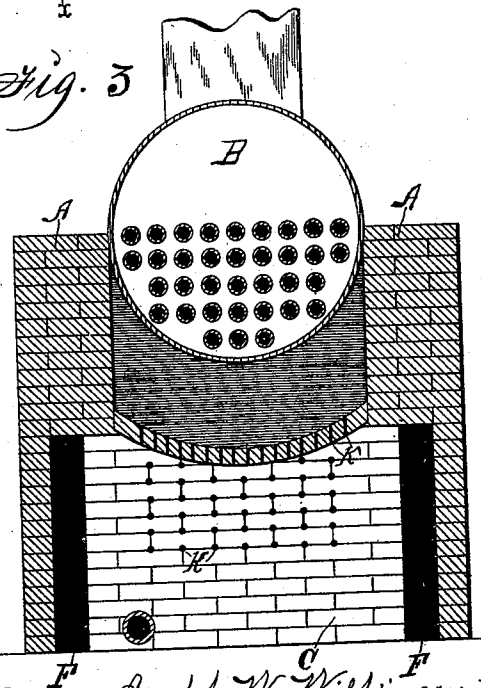


Fig. 3.



Witnesses:
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Inventor: Joseph W. Wilkinson,
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UNITED STATES PATENT OFFICE.

JOSEPH W. WILKINSON, OF DES MOINES, IOWA.

BOILER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 478,210, dated July 5, 1892.

Application filed March 8, 1892. Serial No. 424,121. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. WILKINSON, a citizen of the United States of America, residing at Des Moines, in the county of Polk and State of Iowa, have invented a Boiler-Furnace, of which the following is a specification.

The object of my invention is to promote combustion of the smoke, soot, and gases arising from burning bituminous coal and obviating the annoyances incident to the lodgment of soot upon the boiler-flues and in the chimneys. This object I attain by the rise, in conjunction with a boiler and a fire-grate, of hollow furnace-walls, a hollow bridge-wall, and superheating-tubes rearwardly extended from said bridge-wall.

My invention consists in the construction, arrangement, and combination of parts hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view of the complete furnace. Fig. 2 is a vertical transverse sectional view on the indicated line *x x* of Fig. 1. Fig. 3 is a vertical transverse sectional view on the indicated line *y y* of Fig. 1.

In the construction of the furnace shown, A designates the side walls of a furnace, and B a boiler supported thereon.

C designates a bridge-wall having an interior cavity D, opening into interior cavities F in the side walls A, which latter cavities are located on either side of the combustion-chamber H, in which the fire-grate J is mounted. Perforations K in the bridge-wall C afford communication between the cavity D and the combustion-chamber H above the fire-grate J. Perforations L in the side walls A afford communication between the cavity F and the combustion-chamber. A superheating-pipe M opens from the combustion-chamber H below the grate J and, extending rearward through the bridge-wall, is bent and continued upwardly to a plane slightly below the top of said bridge-wall, from whence said pipe extends rearwardly through and across the hot-air chamber, thence transversely of said chamber, and returns to the bridge-wall, and is provided with an exit within the cavity D. A curved pipe N, having perfora-

tions O in its forward side, is located in the rear of the bridge-wall C and directly in the path of the draft from the combustion-chamber, which pipe is connected to and communicates with the pipe M through the medium of the pipe P.

Doors S in the front wall T of the furnace provide means of access to the combustion-chamber.

In the practical operation of my invention approximately cold atmospheric air is drawn into the pipe M from below the grate J and conveyed through and heated within the hot-air chamber, and is either discharged through the perforations O in the pipe N or into the cavity D; in either event immediately commingling with the products of combustion in its superheated state, and by affiliating therewith produces an inflammable gas which burns and completely destroys the smoke, soot, and offensive gases arising from bituminous coal when in process of combustion. Owing to the fact that the pipe M will convey a greater amount of air than will pass through the perforations O, a considerable quantity of said air so conveyed will be discharged into the cavity D and forced in jets through the perforations K and L in a superheated state, and by commingling with the soot, smoke, and gases form an inflammable gas, which in burning will consume all the natural products of combustion.

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

1. In a boiler-furnace, the combination of hollow furnace-walls on either side of a fire-grate, a hollow bridge-wall, the cavity in which communicates with the cavities in the hollow side walls, and a superheating-pipe located in a hot-air chamber, one end of which pipe opens within the combustion-chamber below the fire-grate, the other end of said pipe discharging into the cavity in the bridge-wall, together with perforations in the side walls on either side of the combustion-chamber and above the grate, as set forth.

2. In a boiler-furnace, a bridge-wall having an air-chamber and perforations at its top to discharge air from said chamber, parallel side walls having air-chambers communicat-

ing with the air-chamber in the bridge-wall
and provided with perforations to discharge
air into the combustion-chamber in front of
the bridge-wall, an open-ended air-conveying
5 tube adapted to convey air into the air-cham-
ber in the bridge-wall, and a perforated air
superheater and distributor connected with
said tube to discharge hot air above and in

rear of the bridge-wall, arranged and com-
bined to operate in the manner set forth, for 10
the purposes stated.

JOSEPH W. WILKINSON.

Witnesses:

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