

No. 626,690.

Patented June 13, 1899.

F. B. GRIFFIN.  
SMOKE PREVENTER.

(Application filed Oct. 5, 1898.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

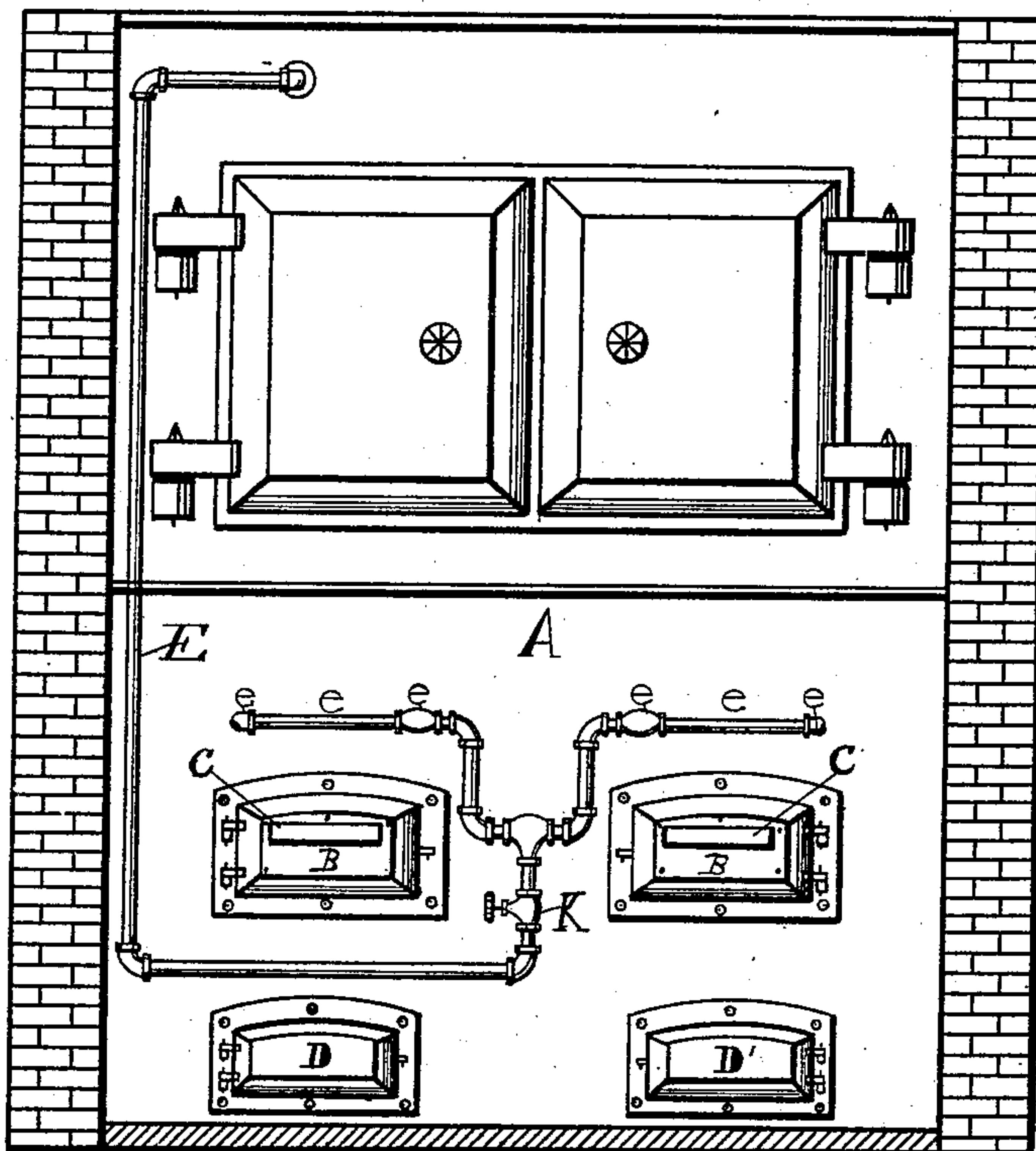
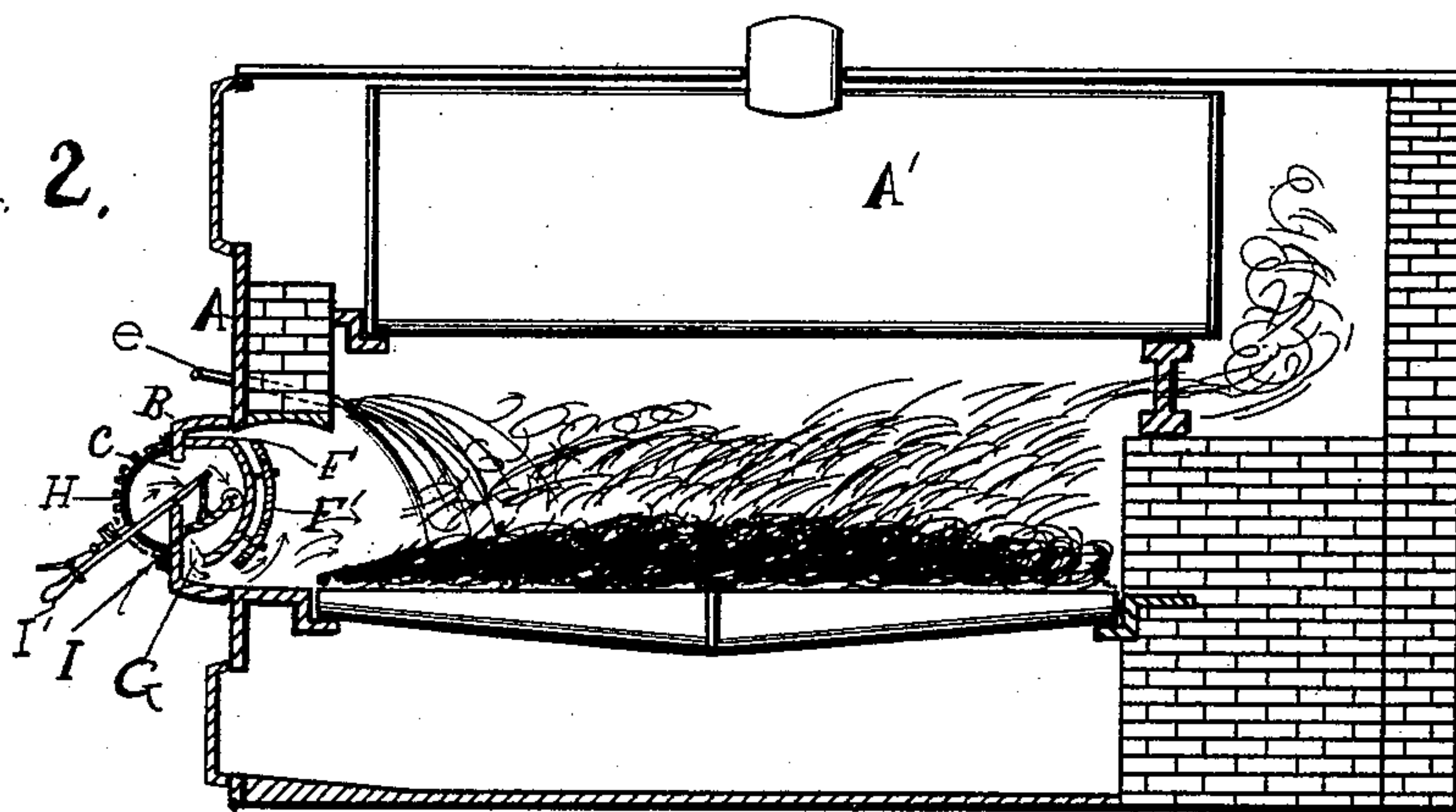


FIG. 2.



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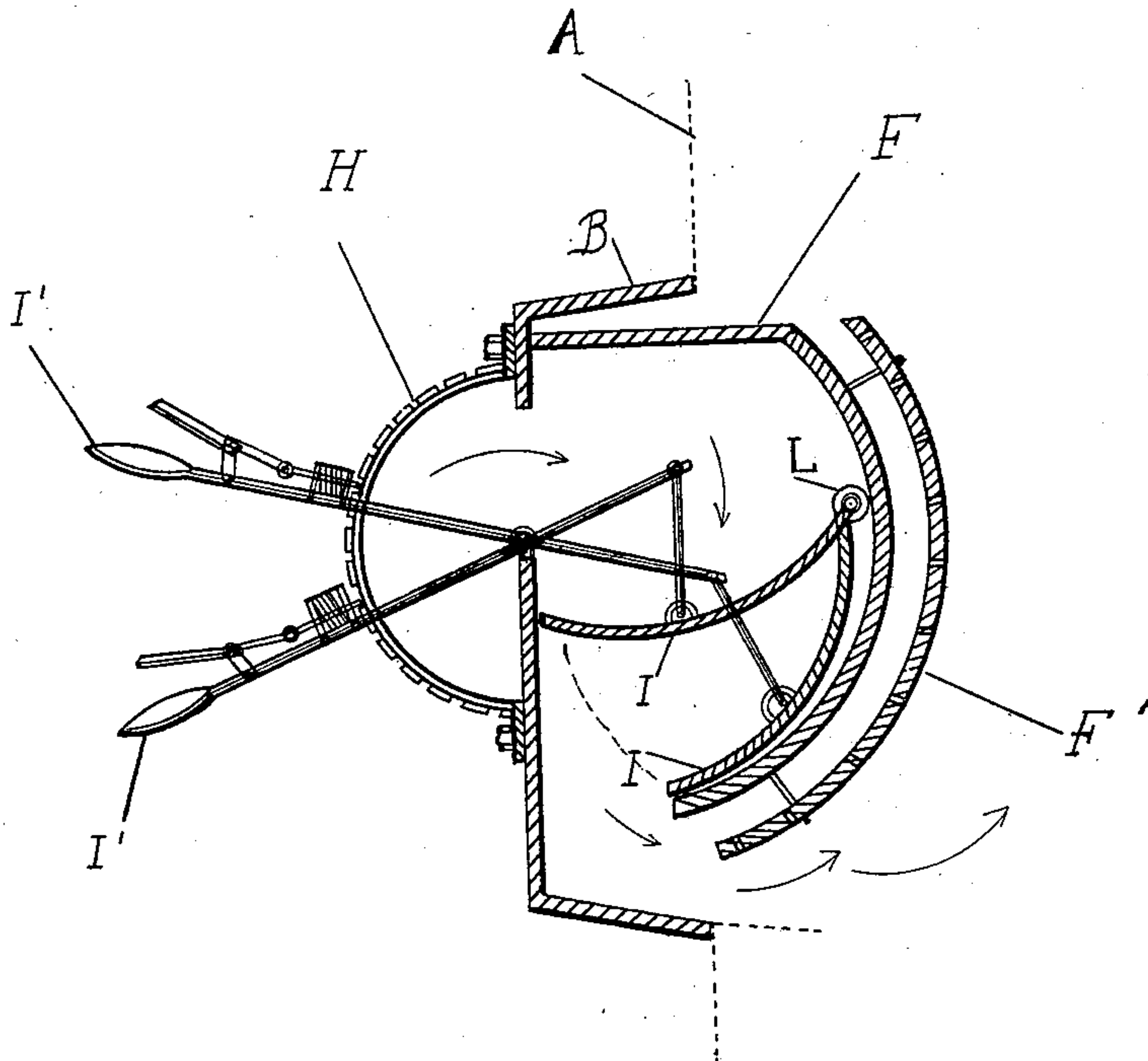


FIG. 3.

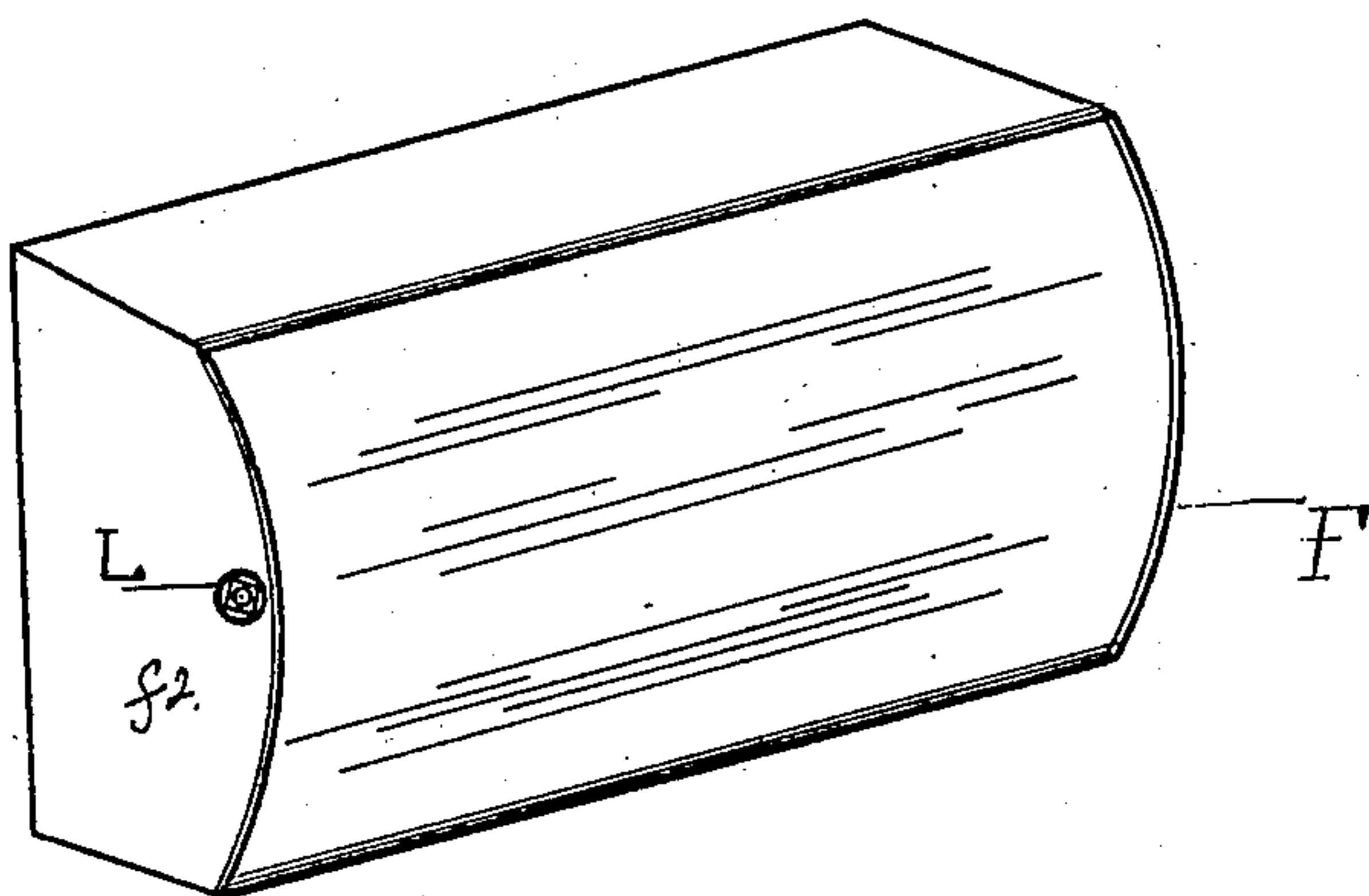


FIG. 4.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

FRANK B. GRIFFIN, OF OSHKOSH, WISCONSIN.

## SMOKE-PREVENTER.

SPECIFICATION forming part of Letters Patent No. 626,690, dated June 13, 1899.

Application filed October 5, 1898. Serial No. 692,670. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK B. GRIFFIN, a citizen of the United States, residing at Oshkosh, in the county of Winnebago, State of Wisconsin, have invented certain new and useful Improvements in Smoke-Preventers, of which the following is a specification.

My invention relates to improvements in smoke-preventers, which is especially adapted to boiler-furnaces and will prevent the generation and emission of smoke when constructed and operated in a manner hereinafter fully set forth and described.

The objects of my invention are, first, to provide a simple and inexpensive device, yet effective in operation, which may be applied to the door of the furnace, thus eliminating the necessity of changing the construction of the furnace; second, to provide a device by means of which a draft of hot air may, when so desired, be admitted to the furnace, as will be hereinafter fully described and specifically claimed, and, third, to afford facilities for the proper adjustment of the current of oxygen passing into the furnace that only a sufficient quantity may be admitted as to insure the perfect combustion of the carbon and hydrogen gases when regulated, treated, and otherwise distributed over the various parts of the fire. I attain these objects as illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my smoke-preventer, illustrating its position as applied to the furnace-front. Fig. 2 is a longitudinal vertical sectional view of a boiler-furnace with my smoke-preventer attached thereto and showing the action of the air and steam as they pass on and over the fire. Fig. 3 is a central cross-sectional view of a furnace-door with my smoke-preventer attached thereto, showing its construction, also showing the position of the oval deflecting adjustable plate in an open and closed position, together with the spring-lever, and suitable mechanism used for the adjustment of said plate. Fig. 4 is a view in elevation of the oval lining detached from the door proper and showing the position of the bearings of the adjustable plate.

Similar letters refer to similar parts throughout the several drawings.

A represents a boiler-furnace provided with the usual openings or doors through which the fuel is supplied to the furnace. To the outer edge of these openings or doors are hinged the doors B B, made of a size to conform with these openings, said doors being provided near their top with rectangular openings C C, as shown in Figs. 1, 2, and 3 of the drawings. Around the perimeter of the openings C C and to the inner surface of the doors B B is secured an oval-shaped lining F by means of suitable screw-bolts, said lining having an opening G at its lower extremity, which facilitates the admission of atmospheric air to the furnace after passing through the openings C and G, as is clearly shown in Figs. 1, 2 and 3 of the drawings.

The outer surface of the oval lining F is protected from the heat of the furnace by means of an oval heat-liner F', having a perforated surface and which is provided on its concave surface with two or more lugs which hold said heat-liner a short distance from the oval lining F when secured thereto by means of suitable bolts, as will be understood by reference to Fig. 2 of the drawings.

Within the oval lining F and to its inner central ends  $f^2$ , is hinged an oval deflecting adjustable plate I, being of sufficient size to close the space between the concave surface of the oval lining F and the inner surface of the door B when in an inclined horizontal position, said deflecting plate I having for its bearings suitable screw-bolts L, which enter the plate I from the outer ends  $f^2$  of the oval lining F, which will be readily understood by reference to Fig. 4 of the drawings.

In Fig. 3 of the drawings I have shown the deflecting adjustable plate I in an open and closed position.

To the outer central portion of the doors B B is secured the sprocket-piece H which engages with the spring-lever I', and by which means the deflection of the plate I may be adjusted and held to any desired position. Above the doors B B and through the furnace front wall A is placed a number of small steam-pipes e e e e in a deflecting position,



each pipe being provided with a jet which terminates at the inner surface of the furnace-wall. The quantity of steam discharged therefrom may be regulated by means of the valve  
5 K, placed in the steam-pipe E. By the deflection of the pipes *e e e e* the steam which exits therefrom unites with the current of oxygen which passes into the furnace through the openings C and G of the door B, said current of oxygen becoming hot while passing  
10 between the openings C and G of the door B. Thus by regulating the valve K of the steam-pipe E and by adjusting the deflecting plate I by means of the spring-lever I', held in position by engaging with the sprocket-piece H,  
15 the current of oxygen and the volume of steam thus admitted to the furnace may be so regulated as to allow only sufficient quantities of said oxygen of the air and steam to enter the  
20 furnace that when regulated and otherwise distributed over the various parts of the fire may be required to create a complete combus-

tion of the carbon and hydrogen gases, which is the main object to be attained in order to prevent the generation and emission of smoke. 25

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

In a combination of a furnace-door having an opening therein at or near the top; an oval lining secured to the door around said opening, said lining having an opening in its lower portion, an adjustable oval deflecting plate or damper within the lining, said plate or damper being hinged on screw-bolts located  
30 in the inner central ends of the lining, a sprocket-piece secured to the outer portion of the door adapted to engage the spring-lever to adjust and hold the plate or damper, substantially as and for the purpose specified. 35

FRANK B. GRIFFIN.

Witnesses:

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