

(No Model.)

C. SMITH.
SMOKE PREVENTER.

No. 480,630.

Patented Aug. 9, 1892.

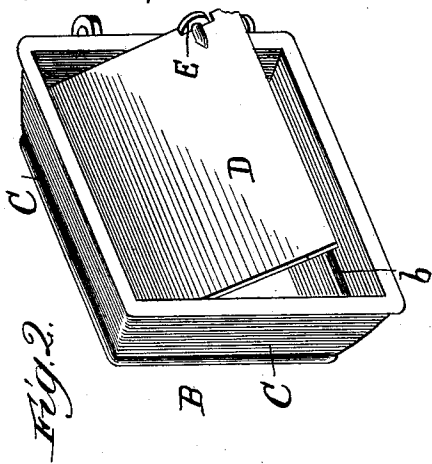
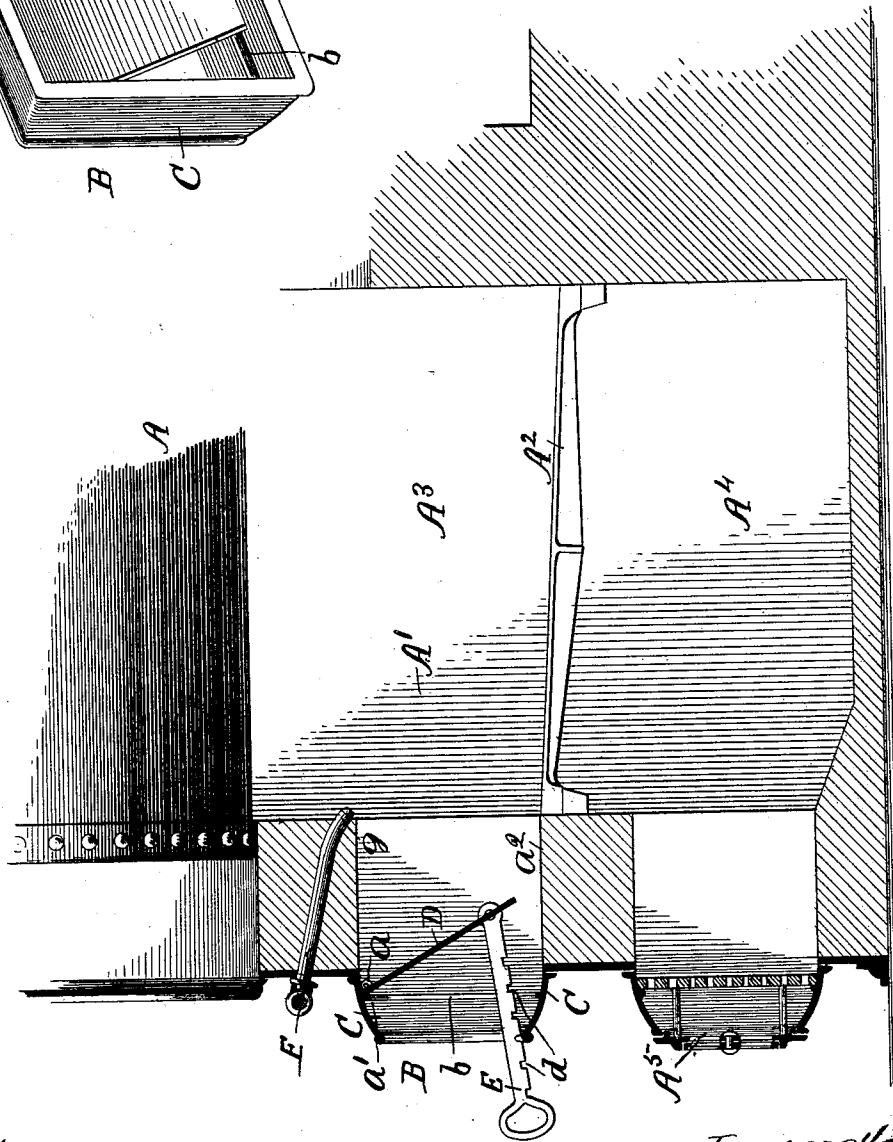


Fig. 2.

Fig. 1.



Witnesses:
Edw. Chipford.
Clifford H. White.

Inventor:
Charles Smith.
By *L. B. Coupland* & Co
Attys.

UNITED STATES PATENT OFFICE.

CHARLES SMITH, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO WILLIAM R. MILLS, OF SAME PLACE.

SMOKE-PREVENTER.

SPECIFICATION forming part of Letters Patent No. 480,630, dated August 9, 1892.

Application filed July 2, 1891. Serial No. 398,267. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SMITH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Smoke-Preventers, of which the following is a full, clear, and exact description, that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a broken-away longitudinal section of a boiler-furnace embodying my improved features; and Fig. 2, a view in perspective of a furnace-door, looking at the inner side.

The object of this invention is to provide an improved device to be used in connection with boiler and other furnaces, whereby a more perfect combustion is effected than is possible under the ordinary arrangement, and thereby prevent the formation of smoke.

Referring to the drawings, A represents a boiler; A', the inclosing wall; A², the line of the grate-bars; A³, the combustion-chamber; A⁴, the ash-pit, and A⁵ the ash-pit door.

This invention relates more especially to the construction of a furnace-door in such a manner as to admit a volume of atmospheric air therethrough and at the same time to govern and regulate such admission as will afford the best results. In the present case the furnace-door B consists of the frame part C and the adjustable valve-door D, inclosed by the frame part. The frame part is hinged to the boiler-front and opens outwardly therefrom in the usual manner. The upper edge of the adjustable door D is hinged, as at *a*, to the downwardly-projecting plate *a'*, formed on or secured to the inclosing frame. This suspended door opens inwardly along the line of the lower edge, as shown, so that the volume of air admitted is deflected onto the dead-air plate *a*² and passes into the furnace on a line with the grate-bars. The valve-door D fits closely within its inclosing frame and when closed shuts tightly against the bead *b*, formed on the interior surface of the frame part. This door when closed assumes a vertical po-

sition. The inner end of the lever-handle E is properly secured to the door D and provides the required means for adjusting said door for the admission of a greater or less volume of air. This lever is provided along its lower edge with a number of notches *d*, which are adapted to engage with the outer edge of the door-frame and lock the door in any position it may be set in governing the admission of air to the furnace. By having the valve-door hinged at its upper edge and made to open or swing inwardly at the bottom provision is made whereby the air passing into the furnace is brought in contact with the fuel at the exact point where a fresh supply of oxygen is required to produce a more energetic combustion, and thereby prevent the formation of smoke.

It is well known that dense volumes of smoke-gases once generated cannot be ignited and consumed. The formation of such gases must, therefore, be prevented by employing means that will effect a more perfect combustion. A steam-jet pipe F leads into the furnace just over the door and terminates on a line with the front end of the grate-bars. The inner or discharge end of this pipe has a slight downward curve, as at *g*, so as to meet and unite with the volume of air flowing in through the valve-door on the surface of the fuel.

It is not always necessary to make use of the steam-jet or to use it continuously. This will be regulated greatly by the variable conditions of the atmosphere and the character of the fuel. The quantity of air to be admitted through the furnace or valve door will also be governed by the same conditions.

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

1. In a smoke-preventer, a furnace-door comprising a frame part and a valve-door inclosed within the frame and closely fitting its interior, said door being hinged at its upper edge to the door-frame and opening inwardly at the bottom and provided with means for locking its lower edge in any desired position, substantially as described.

2. In a smoke-preventer, a furnace-door

comprising a frame part having a bead on its inner surface and a valve-door inclosed within the frame and closely fitting its interior and adapted to shut tightly against the bead, 5 said door being hinged at its upper edge to the door-frame and opening inwardly at the bottom and provided with means for locking

its lower edge in any desired position, substantially as described.

CHARLES SMITH.

Witnesses:

L. M. FREEMAN,
L. B. COUPLAND.