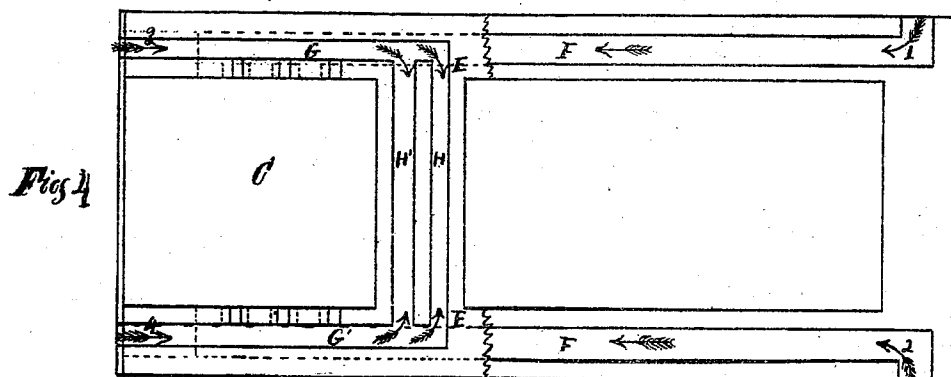
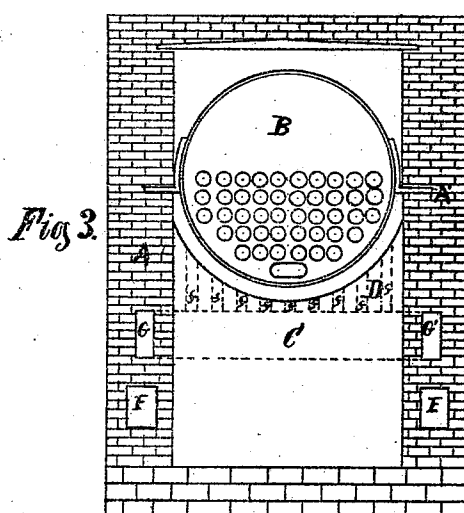
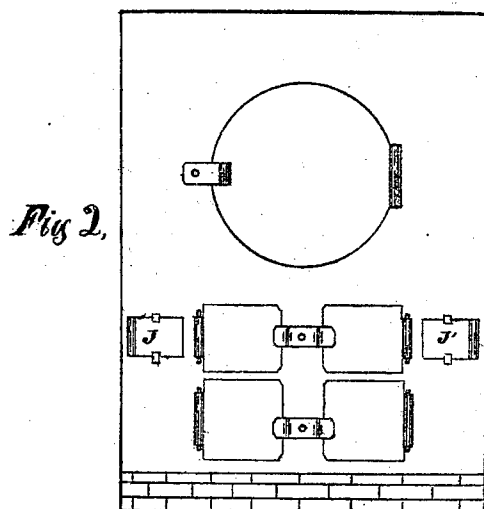
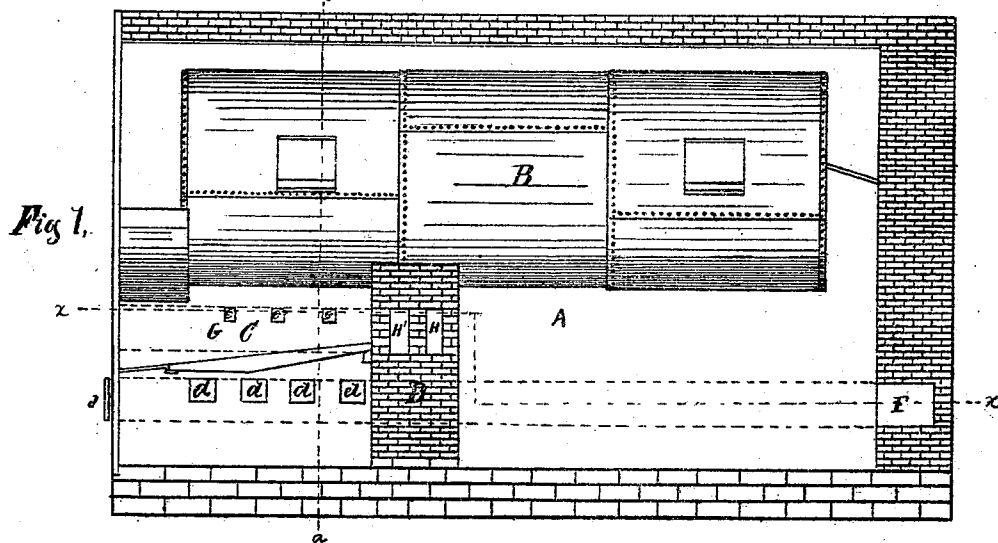


No. 123,300.

Patented Jan. 30, 1872

J. W. Smith.
Smoke and Gas Consuming Furnace.



Witnesses.
C. H. Sherburne
N. C. Gridley

inventor
J W Smith

UNITED STATES PATENT OFFICE.

JACOB W. SMITH, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. 123,300, dated January 30, 1872; antedated January 22, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, JACOB W. SMITH, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Smoke and Gas Consuming Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1 is a side elevation of a furnace embodying my invention, the side wall being removed, showing the interior parts thereof. Fig. 2 is an end view of the same. Fig. 3 is a vertical transverse section, showing those parts which are at the right hand of the line *a a*, drawn vertically through Fig. 1; and Fig. 4 is a transverse longitudinal section or plan taken on line *x x*, drawn across Fig. 1.

Similar letters of reference indicate like parts in the several figures of the drawing.

The object of my invention is to provide a smoke and gas consuming furnace, so arranged as to be applicable to all steam-boilers, and the improvement consists in a series of air-flues arranged to supply a current of heated air, thereby facilitating the combustion of the smoke and gas as it passes from the burning fuel.

In the drawing, A and A' represent the side walls of the furnace, which may be constructed of any suitable material. B is the boiler, which is supported within the walls of the furnace in the usual manner. C is the fire-box, which is formed in the front portion of the furnace, as shown in Figs. 1 and 2. D is the bridge, which extends transversely across from side to side of the furnace, and is connected with the walls A and A', as shown at E. F and F' are the lower air-flues, which are formed in the walls A and A', and communicate with the fire-box beneath the fire through openings *d*, cut through the inner portion of the wall. G and G' are the upper air-flues, which are

also formed in the said walls above the flues F F', as shown in Fig. 1. The said flues G G' communicate one with the other through flues H H', formed within the bridge-wall D, as shown in Fig. 4, and also communicate with the upper surface of the fire through openings *e e*, formed through the inner portion of the walls. The said flues H and H' also communicate with the fire through openings *f*, formed vertically in the bridge-wall D, as shown by dotted lines, Fig. 3. J and J' are sliding doors, which are affixed to the end of the furnace over the opening of flues G G', and so arranged as to admit of being opened and closed, whereby the requisite amount of air is introduced into the fire.

In using my invention, the air for the draught under the fire is admitted into the flues F and F' at the rear of the walls, as shown by arrows 1 and 2, and is discharged from said flues beneath the fire through openings *d d*, and while passing through the flues becomes highly heated by contact with the heated walls on the sides of the fire-box. The air above the fire is admitted into the flues G and G' through the doors J and J', as shown by arrows 3 and 4, which is also heated by contact with the walls of the fire-box, and is discharged through openings *e e* and *f* into the same, near the upper surface of the fire, thereby facilitating the combustion of the gas and smoke.

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

In combination with the flues G G' formed in the side walls and provided with openings *e e*, the flues H and H' formed in the bridge-wall D, and provided with openings *f* whereby the respective currents of air are admitted into the fire, substantially as and for the purpose described.

JACOB W. SMITH.

Witnesses:

N. C. GRIDLEY,
N. H. SHIRBURNE.