(No Model.)

A. C. ENGERT.

Smoke Consuming Furnace.

No. 239,472. **Patented March 29, 1881.**

Fig: 1.

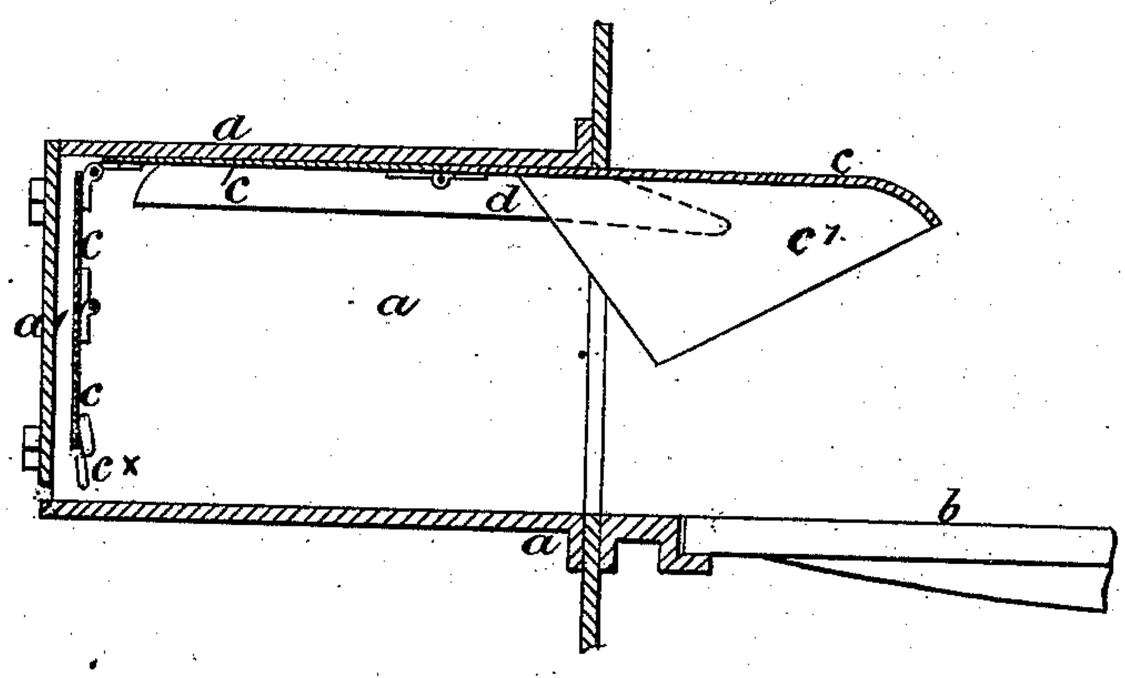
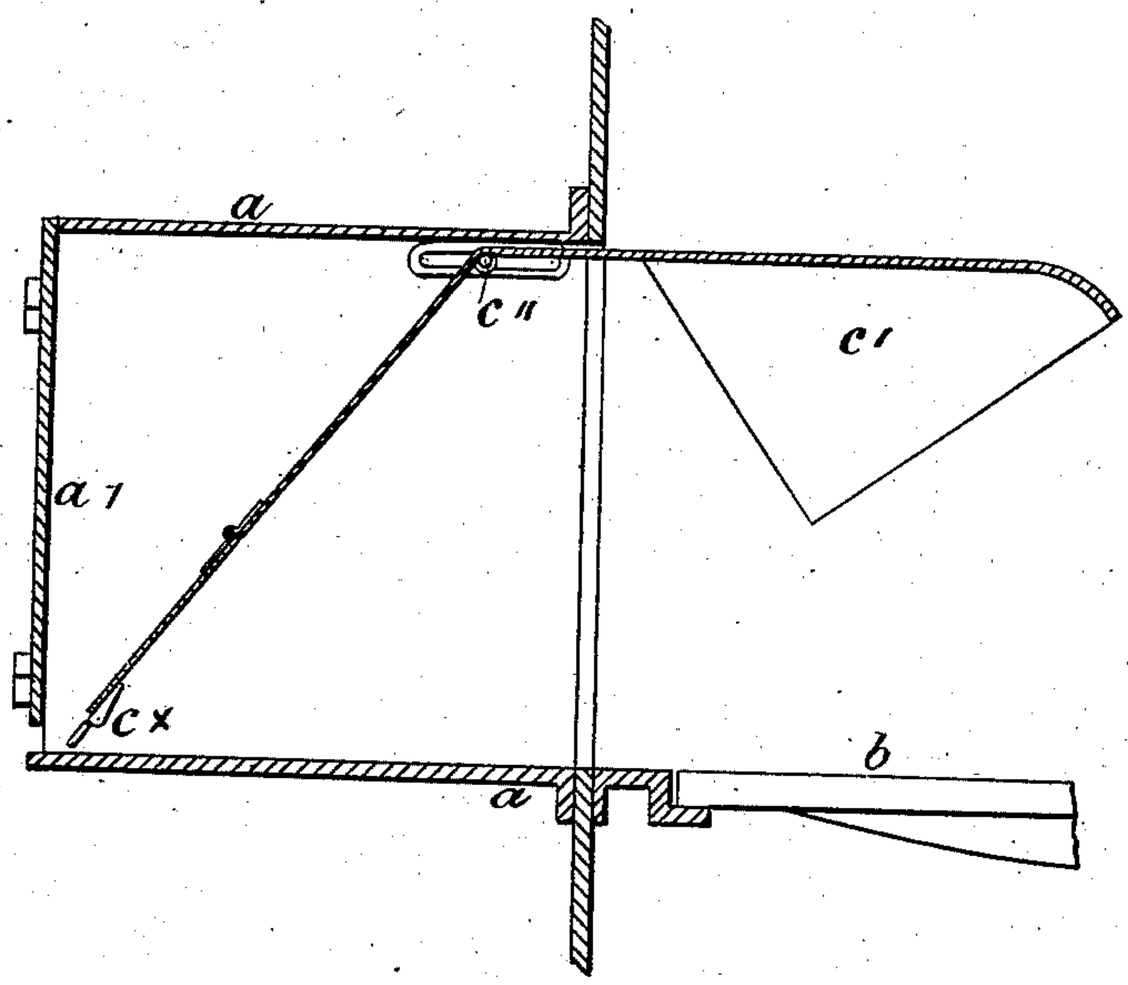


Fig: 2.



Witnesses.
Wm. A. Skinkle.
Chas. H. Baker.

By his Attorneys

Inventor.
Adam C. Engert.
Baldwin, Hopkins, & Peyton

UNITED STATES PATENT OFFICE.

ADAM C. ENGERT, OF THREE MILLS LANE, BROMLEY-BY-BOW, COUNTY OF MIDDLESEX, ENGLAND.

SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 239,472, dated March 29, 1881.

Application filed November 30, 1880. (No model.) Patented in England September 10, 1880.

To all whom it may concern:

Be it known that I, ADAM CYRUS ENGERT, a subject of the Queen of Great Britain, residing at Three Mills Lane, Bromley-by-Bow, in the county of Middlesex, England, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, (for which I have received Letters Patent in England, No. 3,673, dated 10th September, 1880,) of which the following is a specification.

This invention has for its object improvements in apparatus to be applied to furnaces for the prevention or more effectual consumption of smoke. For this purpose I provide within the furnace, at a short distance from the fire-door, a flap or shutter, which, when desired, can be closed down toward the fire-bars and into contact with the burning fuel resting upon them. Thus a small front compartment is temporarily separated by the flap or shutter from the main body of the furnace. In this way the rush of cold air into the main body of the furnace and under the boiler, when the fire-door is opened, is prevented. In feeding the furnace, after opening the door some of the ignited fuel in the front compartment is pushed forward beneath the lower edge of the flap or shutter. Then fresh fuel is laid on the fire which remains, and the fire-door is again closed. The gases resulting from the fuel first put on are then obliged to find their way beneath the flap or shutter, and among the ignited fuel upon which it rests, and so are effectually consumed. In a short time, when the evolution of gas has abated, the flap or shutter is raised out of use, but it is again closed down when the fire-door is next opened.

In order that my said invention may be most fully understood and readily carried into effect, I will proceed to describe the drawings hereunto annexed.

In the drawings, Figure 1 is section of the front part of a steam-boiler furnace. *a a* is a chamber, which I bolt onto the front of the furnace around the fire-door, or rather around the doorway, where a door is usually fitted. I place a simple sheet-iron door at *a'* at the outer end of the chamber *a*. At *b* a portion of one of the fire-bars is seen. *c c* is a jointed flap or shutter carried upon guides *d d* within the chamber *a*. The inner end of this shutter is formed as a hood, as is seen at *c'*. When the furnace is to be fed with fresh fuel the shutter *c* is pushed forward until the hood *c'* descends down on or near to the ignited fuel resting on the fire-bars. Thus when the door is opened the rush of cold air into the furnace is prevented. Some of the ignited fuel is then pushed forward beneath the edge of the shutter, and its place is supplied with fresh fuel, which is laid upon the fire which still remains in the outer compartment, temporarily separated by the shutter from the body of the furnace. The fire-door is then closed. The gases evolved from the fuel on the fire have now to find their way beneath the edge of the shutter to reach the body of the furnace and to pass to the chimney. The smoke and gases are thus brought into close proximity to fuel in a state of active combustion, and so are effectually consumed. When the evolution of smoke has for the most part ceased the shutter *c* may be drawn up. The door and shutter are both so formed that a little air may enter the furnace by the doorway and carry forward with it the smoke and gas evolved by the fresh fuel.

Fig. 2 shows an arrangement differing somewhat in its detail. The shutter is lowered by tipping upon pivots *c'' c''*, which are also able to slide along guides. Suitable retaining-stops are provided, but these are not indicated in the drawings. To admit of the shutter being readily worked, it is provided with an eye at $c^{\times}$, into which the workman inserts a hook, by means of which, in closing the shutter, he first raises the hanging portion and then pushes it forward. The ends of the guides *d d* are inclined and form stops, on which the hood *c'* is allowed to lie when it is desired to have the shutter partly closed, and when raking out clinker. On pushing the shutter farther in the hood comes down until its edge rests on the fuel.

The shutter may be so arranged that it may be worked without opening the door at *a'*, but in practice this is not needed.

Having thus described the nature of my said invention, and the manner of performing the same, I would have it understood that I claim—

1. The before-described combination of the fire-bars, the doorway, the chamber around said doorway, and the adjustable hood projecting inside said doorway, overhanging the fire-bars, and having the capacity of swinging down well within the furnace and toward the fire-bars, to so partition off a portion of the fuel resting on said bars, thereby providing a front compartment of an area sufficient to receive the fresh fuel, the said compartment being separated by the hood from the balance and main portion of the furnace and greater part of the incandescent fuel, through which fuel the smoke, &c., from the fresh fuel and air from the front compartment are forced to pass, substantially as and for the purpose set forth.

2. The combination of the chamber *a*, for attachment at its inner end around the usual furnace-doorway, and the sliding jointed flap or shutter having the hood *c'*, substantially as and for the purpose hereinbefore set forth.

3. The combination, with the furnace, of the chamber *a*, the adjustable jointed flap or shutter, the hood, and the guideways along which the flap and hood slide to rock down the hood and swing up the flap, or vice versa, substantially as and for the purpose hereinbefore set forth.

London, 28th October, 1880.

A. C. ENGERT.

Witnesses:

GEO. J. B. FRANKLIN,

JOHN DEAN,

Both of No. 17 *Gracechurch Street, London.*