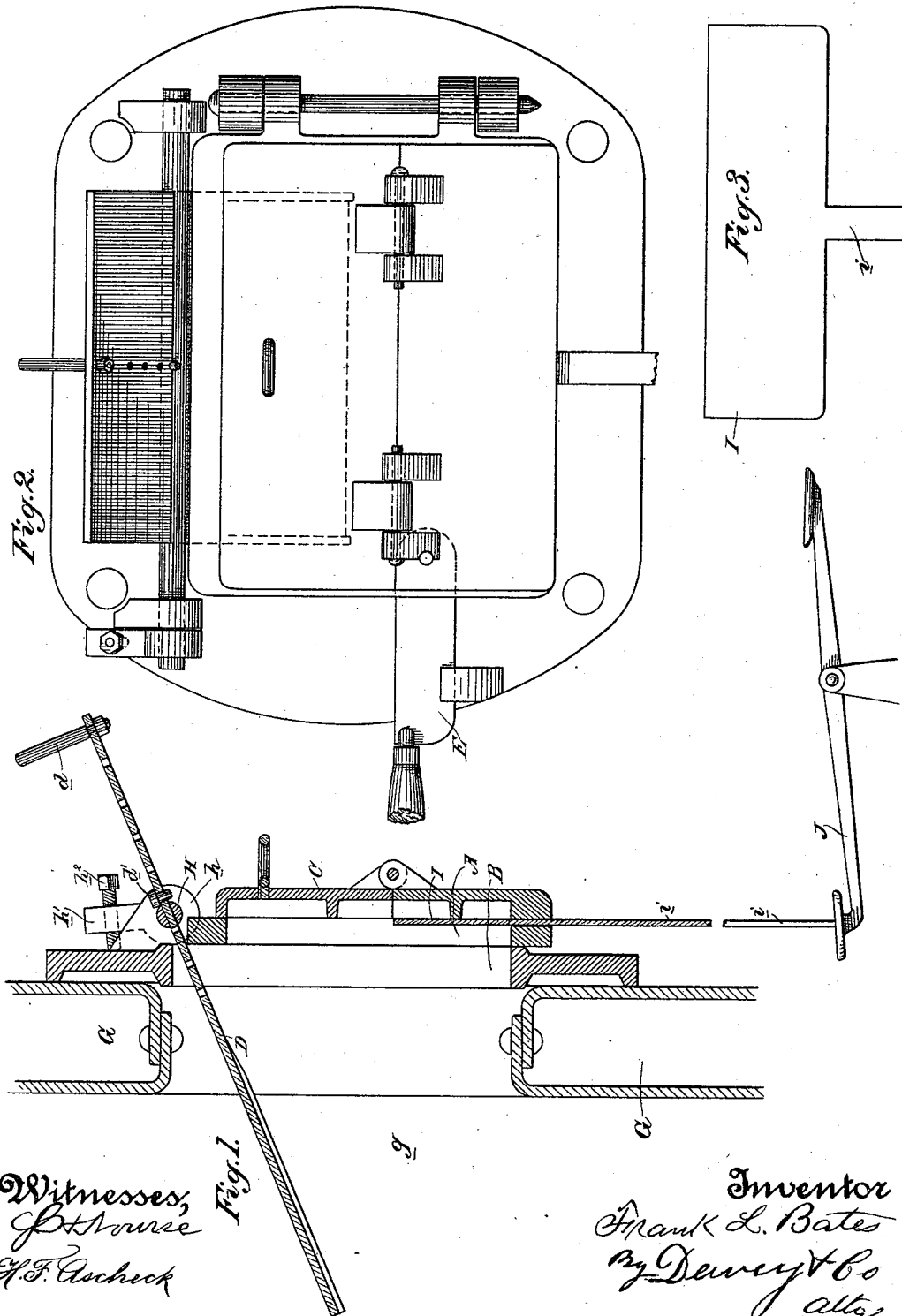


(No Model.)

F. L. BATES.  
SMOKE CONSUMER.

No. 455,153.

Patented June 30, 1891.



Witnesses,  
J. H. Hourse  
H. F. Archibald

Fig. 1.

Inventor  
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# UNITED STATES PATENT OFFICE.

FRANK L. BATES, OF SACRAMENTO, CALIFORNIA.

## SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 455,153, dated June 30, 1891.

Application filed February 10, 1891. Serial No. 380,978. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK L. BATES, a citizen of the United States, residing at Sacramento, Sacramento county, State of California, have invented an Improvement in Smoke-Consumers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of devices for effecting in furnaces a more perfect combustion whereby the smoke is consumed, in which a plate extending into the fire-box serves to direct the air downwardly and in intimate contact with the fuel.

My invention consists in the novel construction and arrangement of the air-shield, whereby its adjustments are effected, and the peculiar plate for controlling the draft, all of which will be hereinafter fully described, and specifically pointed out in the claims.

The object of my invention is to provide an air-shield mounted in such a manner as to be entirely independent of the door and capable of having a vertical adjustment and a forward and back adjustment.

Another object is to provide for regulating the incoming draft by reducing its volume at an advanced stage of combustion, when the greater portion of the smoke may have been consumed.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical section of a portion of the front wall of a furnace and of its door, showing the application of my air-shield and of the draft-controller. Fig. 2 is a front view of the same. Fig. 3 is a view of the draft-controlling plate.

A is the fire-door of a furnace of any description.

B is the door-casing.

C is the air-door of the fire-door, and consists of the hinged upper section or part of said fire-door, as usual.

D is my air-shield, consisting of a suitable plate.

E is the door-latch.

G is a portion of the front wall of the furnace g.

Mounted in bearings h on the front of the door-casing B is a transverse rock shaft or bar H, having made through it an elongated

slot, through which the air-shield plate D passes. The shield is thus carried by the shaft, and it can be adjusted forward or back to throw it farther into or withdraw it more from the furnace by simply slipping it through the slotted shaft H. A handle d is secured to the end of the shield for convenience in adjusting it, and said shield is held in the place to which it is adjusted by means of a small pin d', dropped through any of a series of holes, as shown, in the shield.

If, for example, it be desired to withdraw the shield a little more from the furnace, the pin d' would be lifted from the hole in which it is shown in Fig. 1. The shield would then be drawn outwardly until the succeeding hole was exposed and the pin then dropped through it. To adjust the shield farther into the furnace, the pin would be removed, the shield pushed in, and the pin then dropped into a fresh hole.

In addition to the adjustment forward and back of the shield, it has a vertical adjustment, in order to throw its inner end toward or from the mass of burning fuel, as may be required. This is effected by means of the arm h' on the rock-shaft H and the set-screw h<sup>2</sup>, passing through said arm and bearing against the door-casing, as shown in Fig. 1. Now by turning this screw in the arm will be rocked outwardly and the inner end of the air-shield raised. By turning the screw out the inner end of the air-shield will be lowered. It will be seen that this air-shield, being mounted independently of the door, does not interfere with the operation of said door, and all of its adjustments can be effected without regard to the size of the door-opening, and therefore said shield can be made as large as may be required and adjusted to the positions found best.

I is the draft-regulating plate mounted in the cavity of the door A, and having a stem portion i extending downwardly through said door. The upper end of this plate normally reaches to a plane just below the bottom of the air-door. This plate is adapted to be raised by any suitable means, as by the swinging foot-lever J.

When combustion has proceeded to a certain stage and all of the smoke is consumed, it is then unnecessary to keep the air-door

fully open, and much of the draft may be cut off, resulting in a saving of fuel, at times desired. This may readily be effected by the plate I, which can be raised to cover more or less of the opening formed in the door when the air-door C is dropped.

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

10 1. In a furnace, a smoke-consuming attachment consisting of an air-shield extending into the furnace to direct the air-draft down upon the fuel, and a slotted shaft or bar through which the air-shield passes, whereby  
15 it is supported and may be adjusted forward and back, substantially as herein described.

2. In a furnace, the smoke-consuming attachment consisting of the air-shield extending into the furnace to direct the draft of air  
20 upon the fuel, the slotted shaft or bar through which the air-shield passes, whereby it is supported and may be adjusted forward and back, and the removable pin adapted to be dropped through any of a series of holes in the shield  
25 for holding said shield in the position to which it is adjusted, substantially as herein described.

3. In a furnace, the adjustable smoke consuming attachment consisting of the air-  
30 shield passing into the furnace for directing the draft of air upon the fuel, the slotted rock-shaft through which the air-shield passes, whereby it is supported and may be adjusted forward and back, and means for adjusting  
35 said shaft axially to raise or lower the shield, substantially as herein described.

4. In a furnace, the adjustable smoke-consuming attachment consisting of the air-shield passing into the furnace for directing

the draft of air upon the fuel, the slotted rock-  
40 shaft through which the air-shield passes, whereby it is supported and may be adjusted forward and back, the arm of the rock-shaft, and the set-screw of the arm for adjusting  
45 said shaft axially to raise or lower the shield, substantially as herein described.

5. In a furnace, and in combination with its fire-door having the air-door, the shaft or bar mounted in bearings on the door-casing  
50 above the air-door and having a slot through it, and the air-shield passing through the slot of said rock-shaft and extending into the furnace, whereby said shield is supported and is adjustable forward or back, substantially  
55 as herein described.

6. In combination with the fire-door of a furnace having the air-door, the slotted rock-shaft mounted in bearings on the door-casing  
60 above the air-door, the arm and set-screw whereby said shaft is adjusted axially, the air-shield passing through the slotted shaft and extending into the furnace and adjustable forward and back in said shaft, and the removable pin fitting through holes in the  
65 shield for holding it in place, substantially as herein described.

7. In combination with the fire-door of a furnace having the air-door, the vertically-movable draft-regulating plate I, fitted behind  
70 the door and adapted to regulate the air-opening, substantially as herein described.

In witness whereof I have hereunto set my hand.

FRANK L. BATES.

Witnesses:

LINCOLN SONNTAG,  
S. H. NOURSE.