

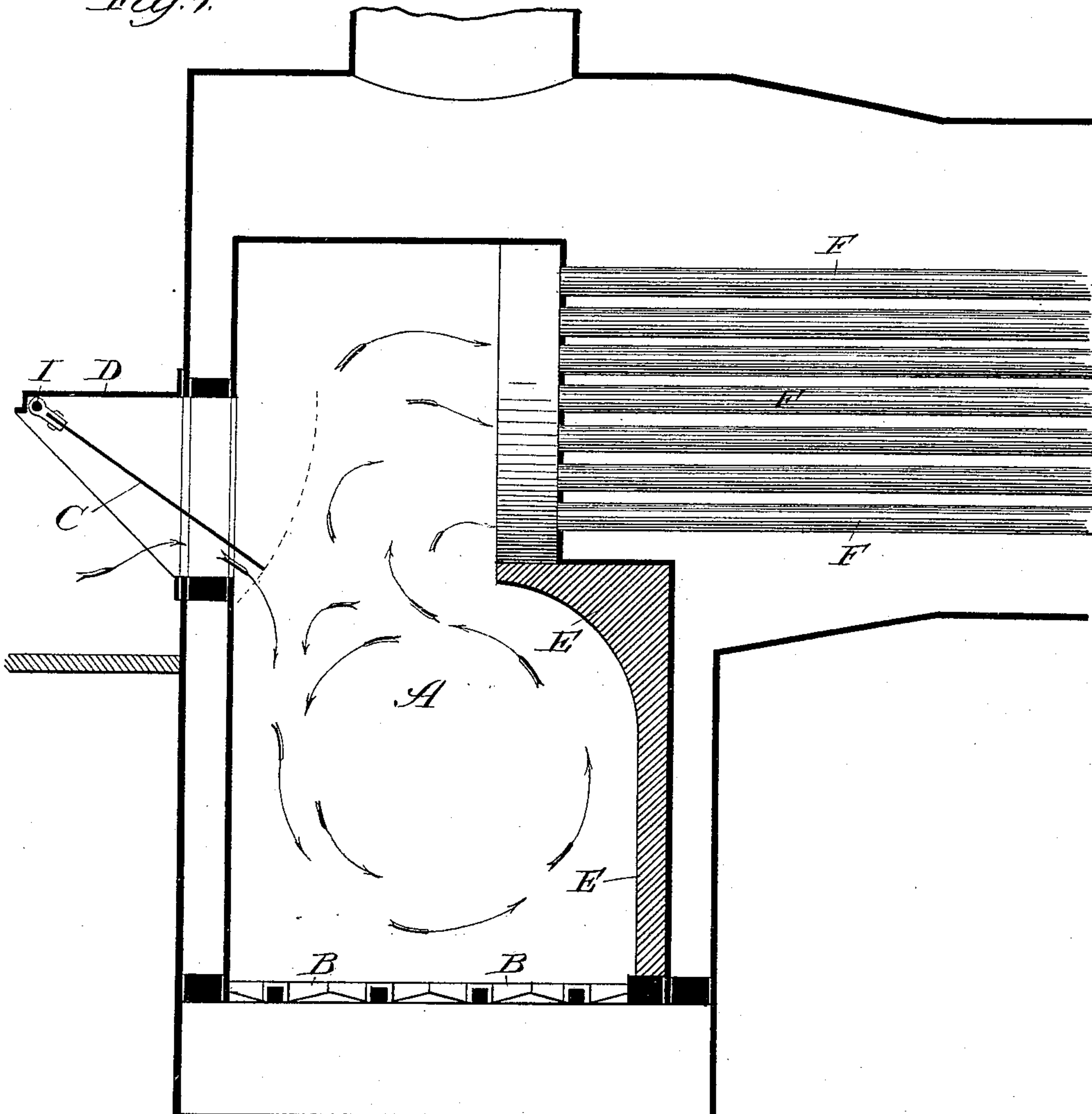
(No Model.)

C. MCGINNISS.  
SMOKE CONSUMING FURNACE.

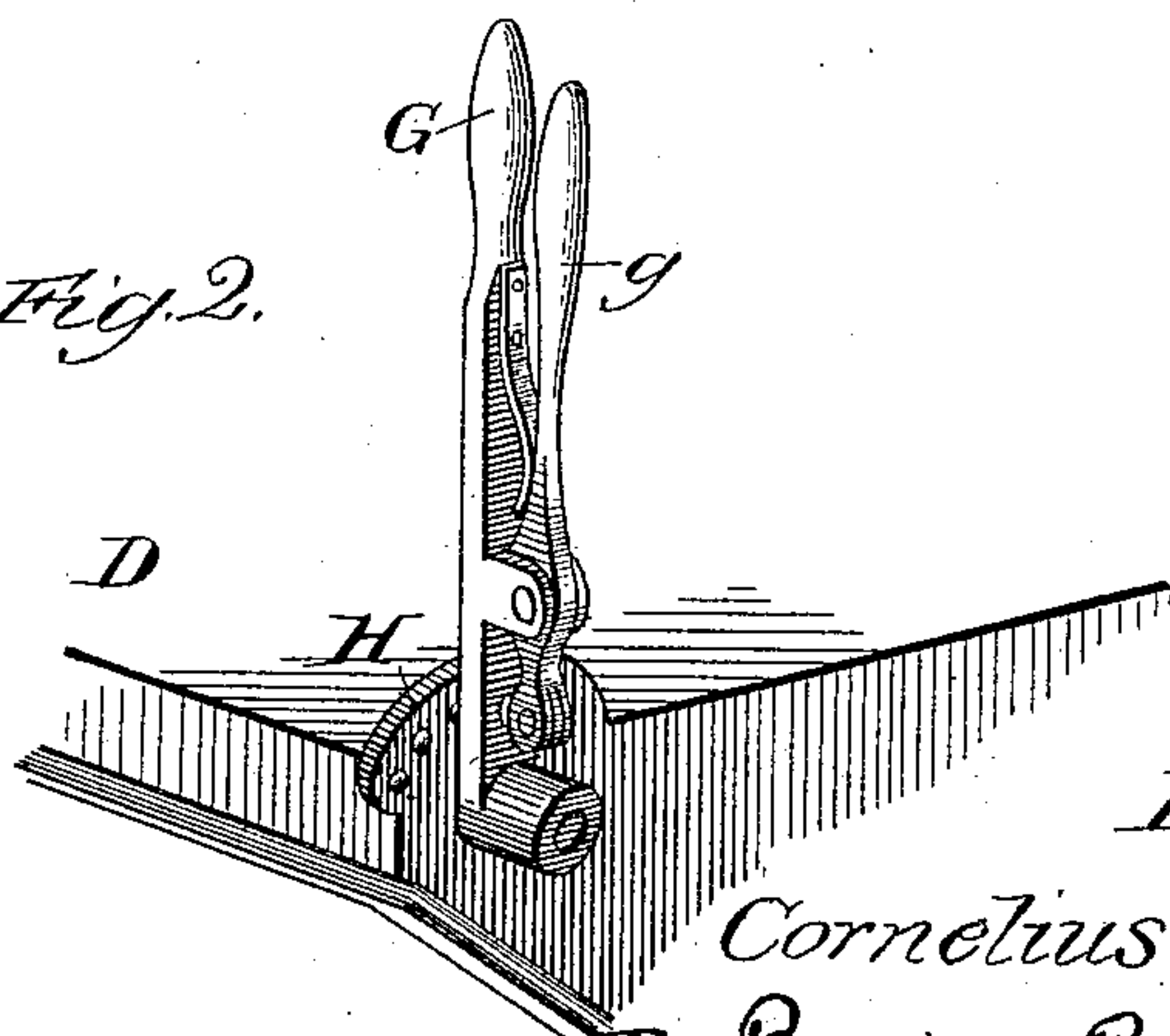
No. 397,135.

Patented Feb. 5, 1889.

*Fig. 1.*



*Fig. 2.*



Witnesses:  
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# UNITED STATES PATENT OFFICE.

CORNELIUS MCGINNISS, OF CHICAGO, ILLINOIS.

## SMOKE-CONSUMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 397,135, dated February 5, 1889.

Application filed November 17, 1888. Serial No. 291,114. (No model.)

*To all whom it may concern:*

Be it known that I, CORNELIUS MCGINNISS, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Smoke-Consuming Furnaces for Locomotives, of which the following is a specification.

In the drawings, Figure 1 represents a vertical section of the fire-box and a portion of the smoke-flues and boiler of a locomotive containing my improvement; Fig. 2, a perspective view of the device for opening and closing the fuel-door and holding the same in any desired position.

A is the fire-chamber of the locomotive; B, the grate-bars; C, the fuel-door; D, a hood or apron surrounding the fuel-door; E, an arch of fire-brick; F F, the smoke-flues; G, rotating hand-levers; *g*, a spring-catch locking into the holes in a plate, H, attached to the outer corner of the apron D.

In constructing my device, I make of iron or other suitable material a hood or apron, D, of the form shown in Fig. 1. This is preferably bolted or otherwise securely fastened to the outside of the boiler in such manner as to inclose the fuel-door at the top and sides, leaving an opening at the bottom, but may, if desired, extend some distance into the fire-chamber. Through the outer and upper edge of this opening or hood I pass a rod, I, having bearings in the sides of the hood, so as to allow it to revolve therein, and to this rod I bolt or otherwise securely attach a metallic plate, which serves as a fuel-door, which is broad enough to close the opening into the furnace and long enough to extend somewhat into the fuel-chamber. To open and close this door and hold it in any desired position, I attach to one of the outer ends of the rod I a lever, G. This is attached to it, as shown in Fig. 2, another lever, *g*, carrying a pin at its lower end, which passes through the lever G and enters one of the holes in the quadrant-plate H, which is fastened to the end of the hood or apron, so that when the lever G is drawn back in opening the door, this pin, entering one of the holes in the plate, will hold both door and lever. The construction and operation of this device are plainly obvious from an inspection of Fig. 2 of the draw-

ings, and need no further description. I next construct of fire-brick or other suitable material the arch E, of the shape shown in Fig. 1. This arch extends downward along the forward wall of the fire-chamber to a point near the top of the grate, and is supported in place by studs fastened into the wall of the fire-chamber. These studs being covered by the fire-brick are thereby protected from the heat. This arch is made with a curve at its upper end and preferably extends some distance beyond the rearward ends of the smoke-flues.

The grate-bars, smoke-flues, and other details of construction do not differ from those in use on ordinary locomotives and therefore require no detailed description.

My device operates as follows: When the door C is opened, the air, which is drawn into the fire-chamber, striking against the door is deflected by it downward across the surface of the fuel, strikes against the arch, passes up the same, and is forced backward by the curve at the upper portion thereof, then passes around the top of the arch and out through the smoke-flues at the stack. The effect of this is to feed air to the fire in sufficient quantities to thoroughly consume the smoke, as the air not only passes over the fuel in first entering the fire-chamber, but, owing to the curved form of the upper portion of the arch, is deflected back with a somewhat rotary motion, so as to pass again over the fuel, insuring the thorough consumption of the smoke and consequently a great saving of fuel.

The distance which the door should be opened must necessarily depend somewhat upon the circumstances of each case; but when the locomotive is running I consider a space of about half an inch enough for the efficient working of the device.

What I regard as new, and desire to secure by Letters Patent, is—

1. The combination, with the fire-chamber of a locomotive, of an arch curved at its upper end, an inclined door for directing air against such arch, and an apron secured to the outside of the fire-chamber in which the door is hinged, substantially as described.
2. The combination, with the fire-chamber



of a locomotive, of an arch curved at its upper end and extending back of the rearward end of the smoke-flues, an inclined door for directing air against such arch, and an apron  
5 secured to the fire-chamber in which the door is hinged, substantially as described.

3. The combination of the door C, apron D,

levers G G, plate II, and arch E, all arranged and operating substantially as described.

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Witnesses:

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