

H. M. SMITH.

Furnace for Steam-Generators.

No. 161,361.

Patented March 30, 1875.

Fig 1

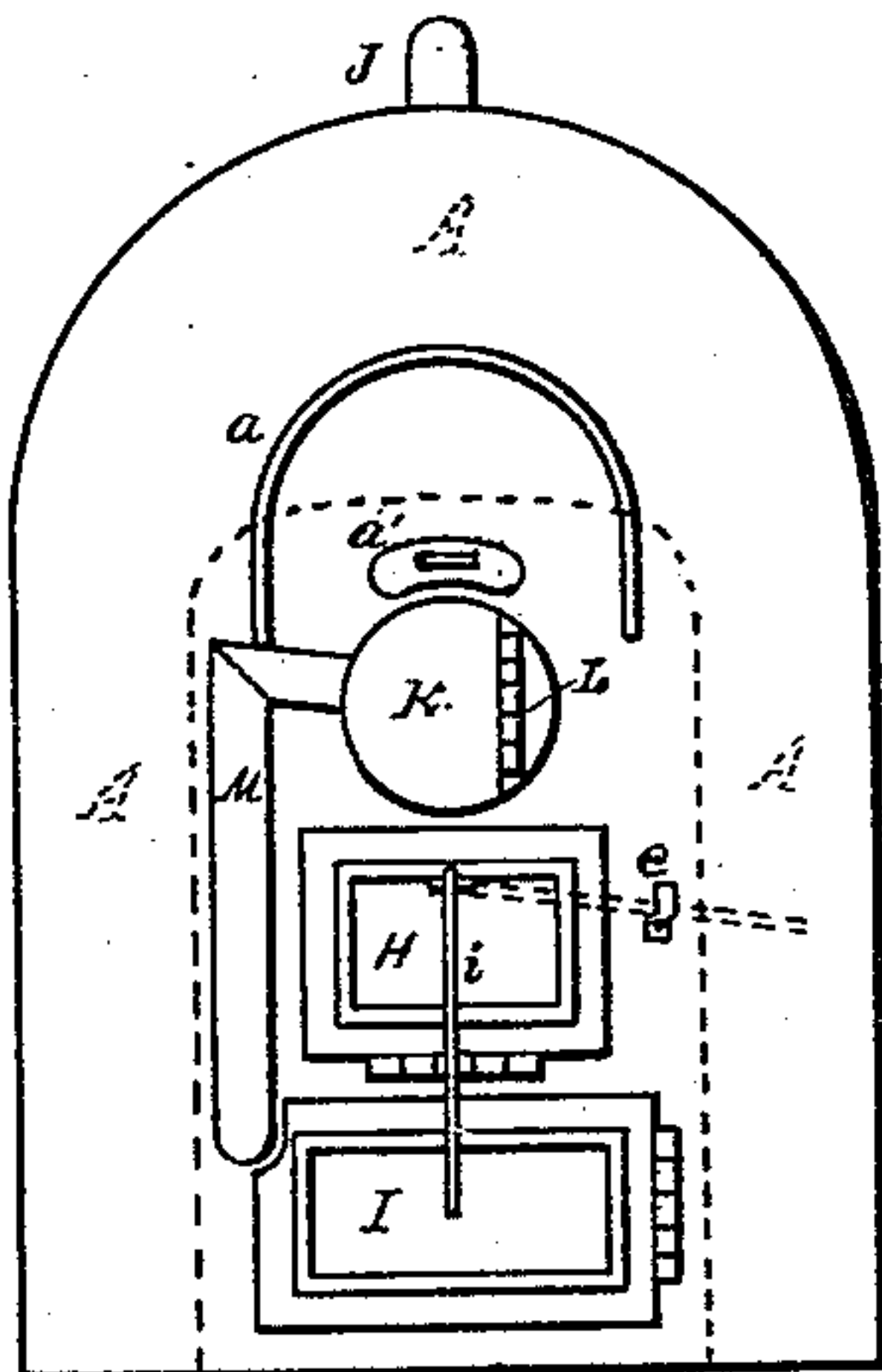
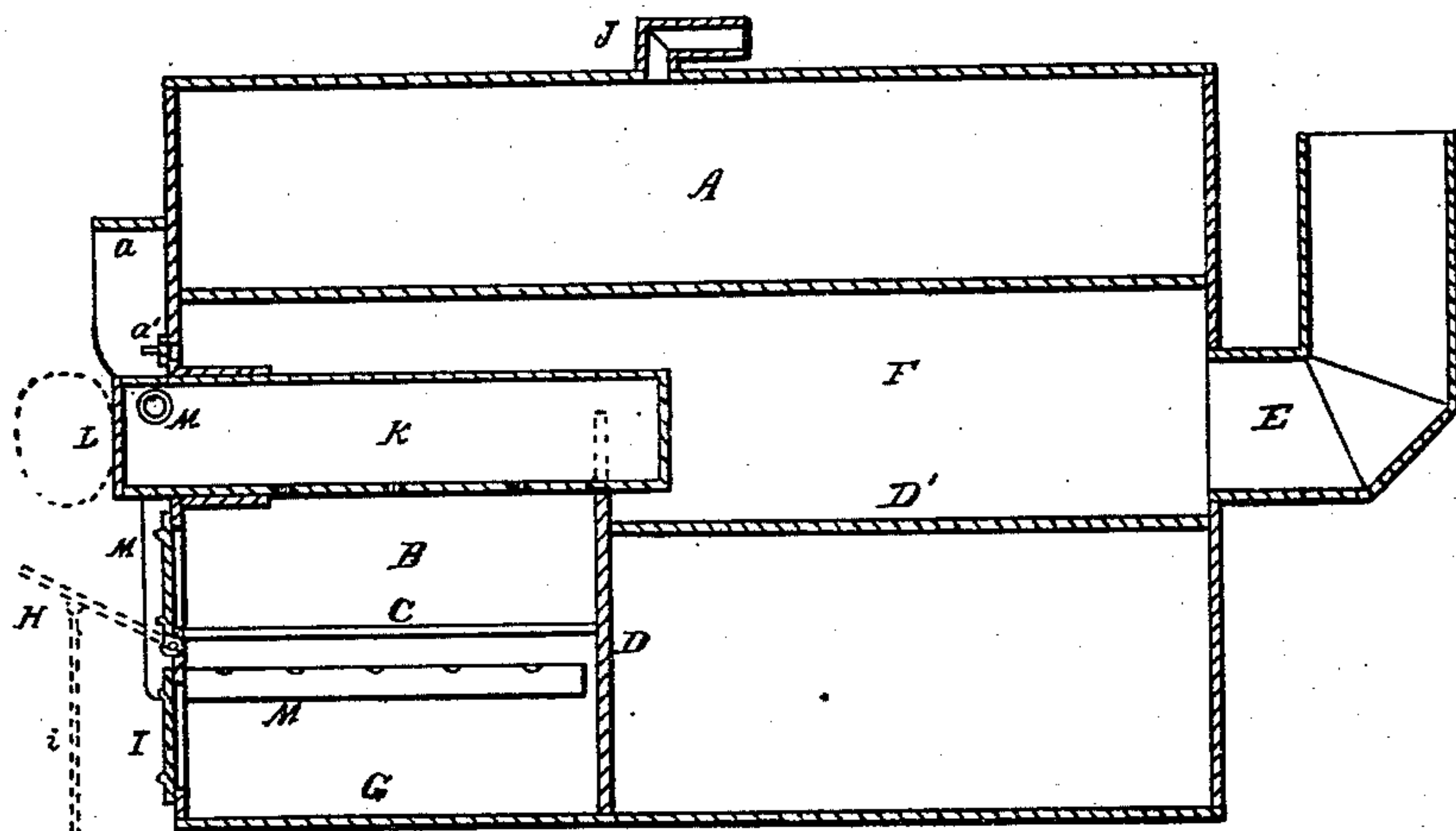


Fig 2



WITNESSES

*N. C. Gidley*  
*F. F. Warner.*

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INVENTOR

# UNITED STATES PATENT OFFICE.

HORATIO M. SMITH, OF CHICAGO, ILLINOIS, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO MOSES W. LESTER AND FRANKLIN LESTER, OF SAME PLACE.

## IMPROVEMENT IN FURNACES FOR STEAM-GENERATORS.

Specification forming part of Letters Patent No. 161,361, dated March 30, 1875; application filed March 18, 1874.

*To all whom it may concern:*

Be it known that I, HORATIO M. SMITH, of the city of Chicago, county of Cook and State of Illinois, have invented certain new and useful Improvements in Furnace for Steam-Generators, of which the following is a full, clear, and exact description, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing, forming a part hereof, and in which—

Figure 1 is a front elevation of a steam-generator provided with my improvements; and Fig. 2, a vertical central longitudinal section.

Like letters of reference indicate like parts.

In the drawing, A represents the reservoir or water-chamber of an ordinary steam-boiler. B is the fire-box, and C is the grate. D D' are walls. E is the smoke-pipe, and F is a flue or chamber through which the products of combustion pass, in order that they may enter the pipe E and escape. G is the ash-pit. H is a door for access to the fire-box, and I is the door in the ash-pit. J is a steam-flue. K is a retort, arranged in the fire-box. L is a door for closing the outer end of the retort. M is a pipe for the purpose of conducting or impinging the gas generated in the retort to or upon the fire in the fire-box.

It is believed that the coke produced from a given amount of coal—from a ton, for example—will be nearly as serviceable for generating steam as the coal would have been before being reduced to coke. When uncoked coal is employed for this purpose the fire is deadened considerably whenever it is replenished, and much of the gas escapes without being utilized. The coke produces a high and even temperature. I am aware that gas produced during the operation of making coke is utilized for various purposes. The object of my invention is to utilize this gas as a fuel for generating steam, in such a manner that coke may be employed for this purpose with greater advantage than coal. For this purpose I have arranged a coking-retort, within the influence of the fire employed to generate the steam, and have provided means for caus-

ing the gas which escapes from the coking coal to become ignited, and to co-act with the fire in the fire-box. When the coal in the retort is coked, the coal thus coked may be placed in the fire-box, and employed for fuel, in the usual manner, and the retort may be refilled. In order to facilitate the operation of transferring the coke from the retort into fire-box, I have so arranged the retort that its mouth projects from the face of the apparatus, and have arranged the door L on a vertical hinge. The door H is arranged on a horizontal hinge, and is provided with a brace, *i*, hinged thereto, so that the said door may be thereby supported in an inclined position, below the mouth of the retort. The coke, when drawn from the retort, falls upon the door L, and may be readily dumped upon the grate. At the time it is supplied to the fire the coke will be in a highly-heated condition, and free from moisture. In order to prevent the gas and smoke from entering and remaining in the room in which the apparatus is arranged, I employ a hood, *a*, arranged over the mouth of the retort, in connection with a damper, arranged in the flue F. By this means the gas and smoke may be nearly all drawn into the flue F, and will escape through the pipe E. The support *i* may be employed as a latch, in connection with the catch *e*, as represented in Fig. 1.

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

1. In combination, a steam-generating apparatus, a closed retort, having an outer door, and arranged within the influence of the fire employed to generate the steam, and the pipe M, for conducting to or impinging upon the said fire the gas generated within the retort, substantially as and for the purpose specified.

2. The combination, in a steam-generating apparatus, of the retort K, the pipe M, and the horizontally-hinged door H, all arranged substantially as described, and for the purposes specified.

HORATIO M. SMITH.

Witnesses:

N. C. GRIDLEY,  
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