

S. E. HEWES.

Improvement in Hot-Air Furnaces.

No. 115,956.

Patented June 13, 1871.

FIG. 6.

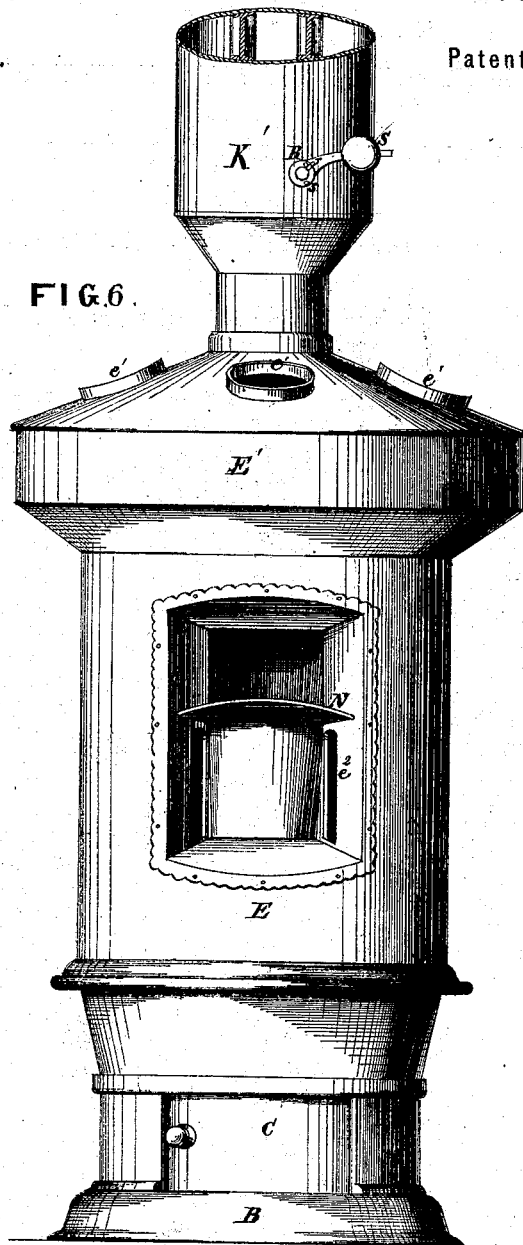
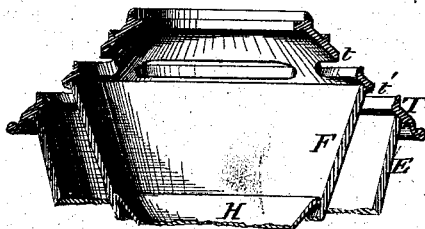


FIG. 7.



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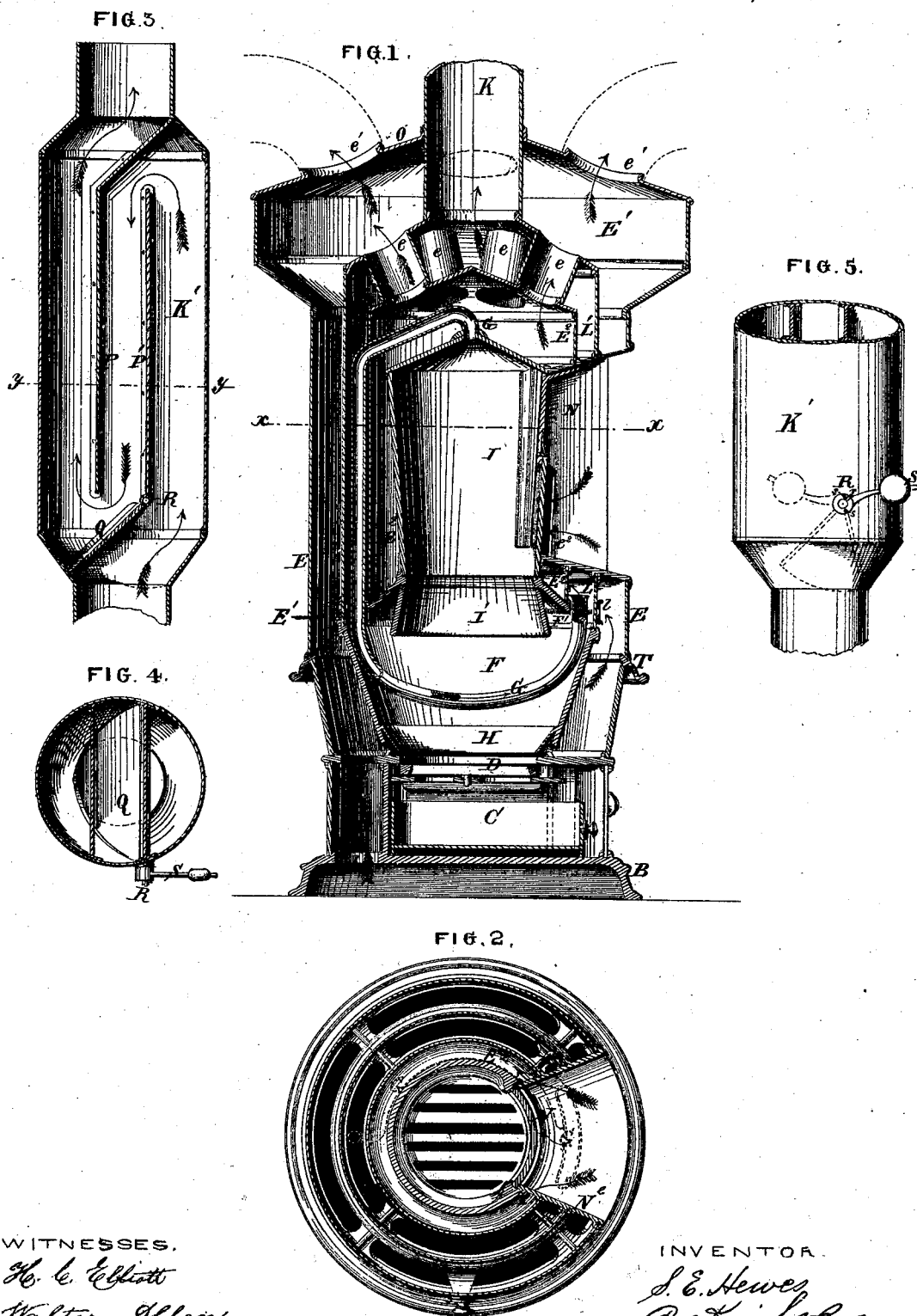
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UNITED STATES PATENT OFFICE.

SHUBAEL E. HEWES, OF ALBANY, NEW YORK.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. 115,956, dated June 13, 1871.

I, SHUBAEL E. HEWES, of the city and county of Albany and State of New York, have invented a new and useful Heating-Stove or Furnace, of which the following is a specification:

Nature and Objects of the Invention.

The subject of this invention is a base-burning or magazine stove, and some parts of the invention have special reference to adapting it for use with bituminous coal.

The invention relates, first, to a conductor by which inflammable gases evolved are taken from the upper part of the magazine and delivered in a heated state into the upper part of the fire-chamber to be there consumed. It relates, second, to a provision by which the magazine is surrounded on all sides (excepting at the fuel-feed door) by an annular chamber, to which air is admitted from outside the furnace, which annular chamber is surrounded on its sides and top by a continuous smoke-flue. It further relates to the combination of two annular air-chambers, each supplied with air from outside, said chambers communicating at top and having a smoke-flue interposed between them, as hereinafter described. The invention further relates to the construction of a crown-plate, which surmounts the fire-chamber and is used for the attachment of the upper parts of the stove. The invention further relates to a drum or radiator of peculiar construction; and further, to an improved damper, which is employed in connection therewith.

Description of the Accompanying Drawing.

Figure 1 is a vertical section of my improved stove or furnace. Fig. 2 is a horizontal section thereof on the line *xx*, Fig. 1. Fig. 3 is a vertical section of the drum or regulator. Fig. 4 is a horizontal section thereof at *yy*, Fig. 3. Fig. 5 is an external elevation of the lower part of said drum. Fig. 6 is a front view of the stove or furnace. Fig. 7 is a vertical section of an improved crown-plate surmounting the combustion-chamber, and employed for the support and attachment of the upper parts. The same figure shows also sections of parts of the fire-pot and of the hot-air casing.

General Description.

B is the bottom plate of the stove; C, the

ash-pit; D, the grate; and H an annular air-heating plate, the form and operation of which are described in a separate application for Letters Patent. E is an external shell or casing, within which is a chamber, E^1 , supplied with air through openings *b*, in the bottom plate B of the stove. F is the fire-pot. I I' represent the fuel-magazine, the lower part of which projects downward into the fire-chamber, and may be made removable, so that it can be removed as often as required. Around this lower part of the magazine is a combustion-chamber, F'. T is a crown-plate, surmounting the fire-chamber, and having extended openings *t*, through which the gases pass into the combustion-chamber L, above. The construction of this plate is best shown in Fig. 7. It is employed for the attachment of the fire-pot, the magazine, and the sections of the external casing E of the air-heating chamber. *t'* are openings in said plate, through which the air rises freely. G is a pipe, communicating with the upper part of the magazine I, from which it is extended downward, within the annular flue L', across the fire-chamber F, from whence it projects upward and discharges within the combustion-chamber L, the mouth of the tube being extended in width, as represented by the dotted lines in Fig. 2. The function of this tube is to receive all the gases evolved by the heat within the magazine and conduct them to the aforesaid combustion-chamber, where they are delivered in a heated state and immediately consumed. In practice the tube G is to be suitably curved, and extended around the interior surface of the fire-chamber in such position that it will not interfere with the descent of the fuel or be injured by falling coal. *l* represents a register for admitting air from a space within the casing E through the external wall of the combustion-chamber L. An inner annular air-space, E^2 , extends around and above the magazine I, being interposed between it and the gas or smoke flue L'. By thus surrounding the magazine on all sides with air it is kept at the lowest possible temperature. The two air-spaces E^1 and E^2 are connected at the upper part through any necessary number of pipes, *e*. The inner air-chamber E^2 is supplied with air through openings e^2 in the door-jamb. N represents a vertically-sliding door,

formed, in its upper part, with an oblique flange, N', which, when the door is lowered, constitutes a chute or conductor to assist in supplying the magazine with fuel. Around the smoke-flue K, in the top O of the furnace, any number of hot-air pipes may be arranged, as illustrated by the dotted lines in Fig. 1, being connected with the openings or collars e'. The smoke-discharge flue K is enlarged to form a drum, K', having within it partitions P P', as illustrated in Fig. 3, the partition P' being permanently connected with a damper, Q, hung upon a shaft, R, and held in either position by means of a weighted arm, S, Figs. 4 and 5. When these parts are in the position illustrated by the full lines in Figs. 3, 4, and 5, the gases will be required to traverse three times the length of the drum so as to more effectually give out their heat; but when the parts are in the position illustrated by the dotted lines in Fig. 5, a direct passage will be afforded through the drum so as to produce a strong draft in kindling the fire. The internal arrangement of the drum is exhibited in Fig. 3, in order to illustrate the action and effect of the damper and the loose arm S, which I have combined therewith. By attaching the arm S loosely to the shaft R and causing it to control the same through the pins s s, striking a stud, r, projecting from the shaft R, I adapt the said arm to move through a space of nearly one hundred and eighty degrees, while the damper may move not more than one-third as far. The weighted arm is thus caused to rest in a nearly horizontal position

at each end of its stroke, so as to hold the damper firmly in either position.

I claim as my invention—

1. The pipe G, constructed and employed, substantially as described, to conduct gases from the upper part of the magazine and deliver them in a heated state within the combustion-chamber.

2. The inner annular chamber E², supplied with cold air directly from the exterior, surrounding (excepting at the fuel-feed door) the sides and top of the magazine I, and surrounded on its own sides and top by the continuous smoke-flue L', as herein represented and described.

3. The two annular chambers E¹ and E², each supplied independently with air from the exterior, and communicating at top through pipes e, in combination with the annular smoke-flue L' interposed between the vertical sides and also between the upper parts of said air-chambers, as explained.

4. The connecting crown-plate T t', constructed and employed substantially as and for the purposes set forth.

5. The drum K', constructed with partitions P P', arranged substantially as herein described, in combination with the damper Q, shaft or pivot R, and weighted arm S, arranged to operate substantially as described.

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Witnesses:

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