(No Model.) 2 Sheets—Sheet 1.

G. H. HESS.

FIRE POT.

No. 348,013. Patented Aug. 24, 1886.

Fig. 1.

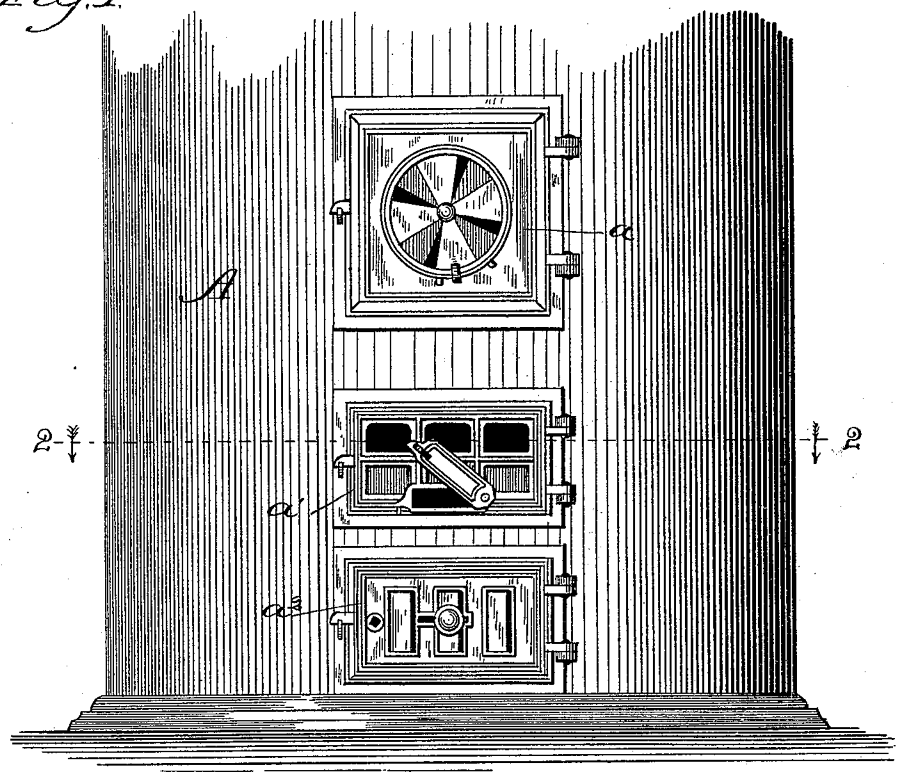
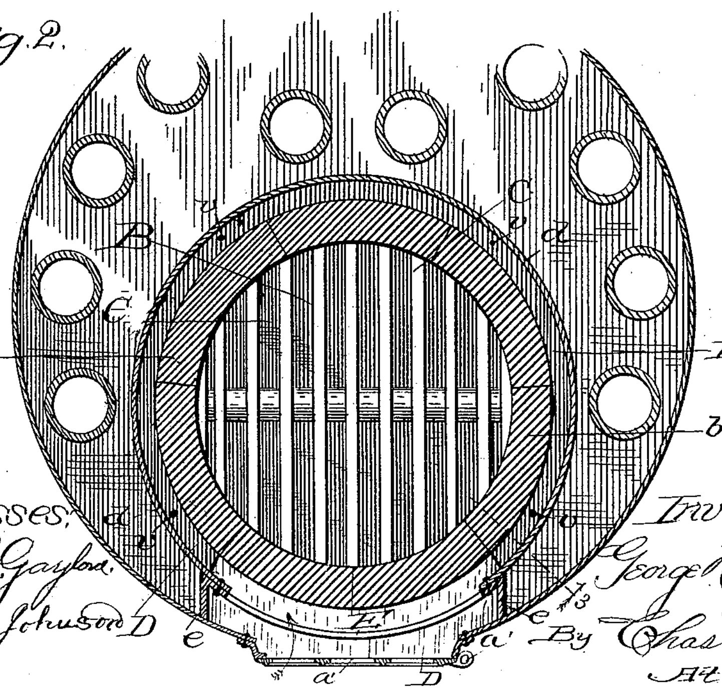


Fig. 2.



Witnesses:
Chas. E. Gaylord.
Arthur Johnson

Inventor:
George H. Hess
By Chas. T. Brown,
Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

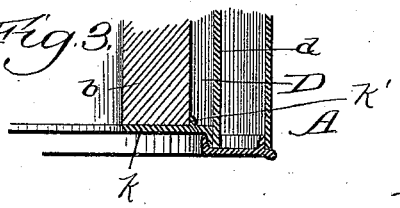


Fig. 4.

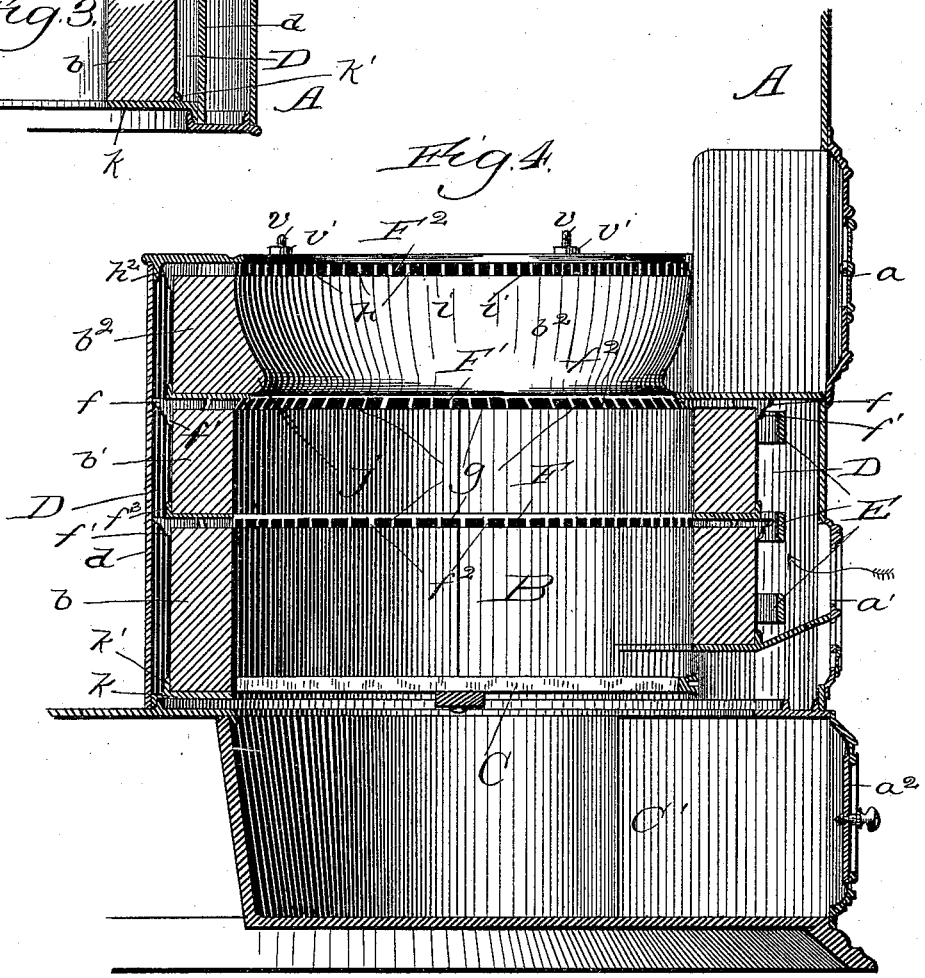


Fig. 5.

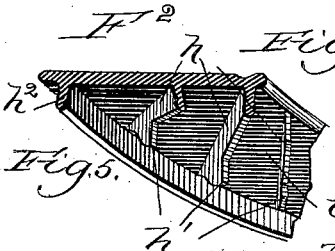


Fig. 8.

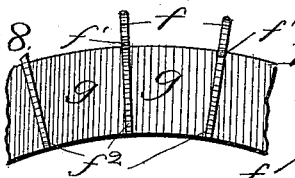


Fig. 7.

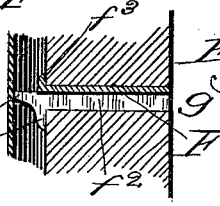
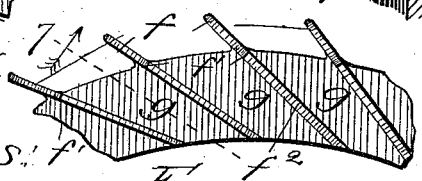


Fig. 6.



Witnesses:
Chas. E. Gaylord.
Arthur Johnson.

Inventor:
George H. Hess
By Chas. A. Brown.
Atty

UNITED STATES PATENT OFFICE.

GEORGE H. HESS, OF CHICAGO, ILLINOIS.

FIRE-POT.

SPECIFICATION forming part of Letters Patent No. 348,013, dated August 24, 1886.

Application filed October 19, 1885. Serial No. 180,247. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. HESS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Fire-Pots for Anthracite and Soft Coal Stoves, Furnaces, Boilers, and the like.

My invention relates to fire-pots suitable for stoves, furnaces, boilers, and the like, in which hard (anthracite) coal or soft (bituminous) coal is to be burned for heating or other purposes, and in which heated air is supplied the burning mass in the fire-pot and combustion-chamber to assist and more effectually promote combustion therein; and the object of my invention is to construct a fire-pot in which the combustion of the smoke and gas evolved from the burning mass contained therein may be more perfectly attained, a more perfect combustion of the coal in the fire-pot secured, and complete control of the combustion of the contents of the fire-pot and the smoke and gases evolved therefrom obtained by a sufficient and regulated amount of heated air supplied thereto and in the manner desired.

I have illustrated my invention by the drawings accompanying this specification and forming a part hereof, in which—

Figure 1 is a front elevation of the lower portion of a furnace containing my improved fire-pot. Fig. 2 is a cross-section on line 2 2 of Fig. 1. Fig. 3 is a sectional view on line 3 3 of Fig. 2. Fig. 4 is a vertical sectional view through center of furnace and fire pot from front to back. Fig. 5 is a perspective view of the top plate, F^2, or casting used in my invention. Fig. 6 is a bottom view of the lower or middle plates. Fig. 7 is a sectional view on line 7 7 of Fig. 6. Fig. 8 is a modification of Fig. 6.

The modification illustrated in Fig. 8 may be used, if desired, and very satisfactory results attained, especially in the burning of hard or anthracite coal; but I prefer the form illustrated in Fig. 6, even where hard coal is to be used, as much better results are obtained by its use.

Like letters refer to like parts throughout the several views.

A is a furnace.

a is the fuel-door.

a' is the air-supply door used in my invention.

a^2 is the ash-pit door.

B is the fire-pot. Fire-pot B is constructed of sections *b b' b²*, of brick or metal, separated by castings F F' F^2. Castings F F' are duplicates, and any desired number of alternations of brick or metal *b b'* and castings F F' may be used. F F' have webs f^2 cast thereon, which form, when the castings are placed in suitable position, as illustrated, conduits or air-ducts from air-chamber D to the fire-pot. Webs f^2 project beyond the outer circumference of castings F F', (forming fingers,) which projection is lettered for convenience of reference *f*. b^2 is surmounted by casting F^2, having webs *h* thereon, forming conduits *i*.

f' is a flange on the under side of web or rib f^2, its purpose being merely to retain pieces *b b'* in position. f^3 is a flange on the upper surface of castings F F', likewise used to retain *b b'*, forming the body of the fire-pot, in position.

The several pieces named as forming the fire-pot B are secured together by the tie-rods *v* and nuts *v'*.

C is the grate.

C' is the ash-pit.

D is an air-space or air-chamber surrounding fire-pot B, and is formed by and between the outer surface of said fire-pot and the inner surface of metal casing *d*. This air-space communicates with the interior of the fire-pot through the several conduits, *g g* and *i i*, and with the outer air through the door *a'*. There is no communication between said air-space and the combustion-chamber, (except through conduits *g* and *i*;) and, further, there is no communication between said air-space D and the ash-pit C'.

E is the door-casing surrounding door *a'*, and connecting air-space D with the outer air, thus cutting off said air-space from the combustion-chamber.

e e are flanges of casing E, forming the sides thereof.

E′ E′ are bands uniting flanges *e e*, and forming a continuation of the casing inclosing the fire-pot.

j is the inner surface or contour of top pieces, b^2, of the fire-pot.

Dampers are placed in door *a′*, to regulate the amount of air admitted to air-space D.

The purpose and object of having webs or ribs f^2 and *h* placed on castings F F′ F^2 diagonally to the radii of a circle is that a rotary motion is thereby imparted to the heated air entering the fire-pot through conduits *g* and *i*, and such rotary motion tends to resist the upward draft in said fire-pot, caused by the air entering said fire-pot through grate C, as well as to counteract the tendency said heated air has to rise above said fire-pot after entering the same through said conduits. The inner surface or contour, *j*, of top pieces, b^2, also tends, by the projection thereof, to retain said heated air entering the fire-pot through conduits *g i* from air-space D in close proximity to the burning mass contained in said fire-pot.

The operation of my improved fire-pot is as follows: Air is admitted to the contents of the fire-pot through grate C, and at the same time a regulated amount of air is admitted to air-space D. The amount of air admitted through grate C is at all times under control through the damper in ash-pit door a^2, as is the amount of heated air admitted through conduits *g i* by damper in air-supply door *a′*. The rotary motion imparted to the air admitted through conduits *g i* tends to keep said heated air in close proximity with the contents of the fire-pot and the smoke and gases evolved therefrom, and to more thoroughly mix the same, which are thus more perfectly consumed, leaving a very small percentage of waste products therefrom.

It is evident that the precise form or shape of the furnace to which my improved fire-pot may be adapted, and with which it may be used, is of no material importance, provided said furnace is constructed upon the principles described and set forth in the furnace illustrated herein.

Having thus described my invention, its construction and method of operation, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a furnace or stove or steam-generator, the combination of a fire-pot having conduits or air-ducts passing through the same, with metal casing *d* surrounding the fire-pot, with a space between the two, casing A, door or dampers *a′*, and casing E *e* around said door or damper, extending from casing *d* to casing A, whereby the chamber around the fire-pot communicates with the open air independent of the ash-pit or combustion-chamber of said fire pot, all substantially as described, and for the purpose set forth.

2. In a furnace or stove, a fire-pot having conduits therein arranged diagonally with the radius of the fire-pot, in combination with metal casing *d*, surrounding the fire-pot, with a space between the two, casing A, door or dampers *a′*, and casing E *e* around said door or damper, extending from casing *d* to casing A, whereby the chamber around said fire-pot communicates with the open air independent of the ash-pit or combustion-chamber of said fire-pot, all substantially as described, and for the purpose set forth.

3. A fire-pot constructed of alternate layers of brick or metal, and castings having webs or flanges thereon, forming, in connection with said first-named pieces of brick or metal, conduits for the admission of air to the body and surface of the contents of the fire-pot, from an air-space surrounding said fire-pot, the upper series of said first-named pieces of brick or metal projecting into said fire-pot and overlapping said conduits, all substantially as described, and for the purpose set forth.

4. A fire-pot constructed of alternate layers of brick or metal, and castings having webs or ribs thereon, forming, in connection with said first-named pieces of brick or metal, conduits arranged diagonally to the radius of the fire-pot, for the admission of air to the body and surface of the contents of the fire-pot from an air-space surrounding it, all substantially as described, and for the purpose set forth.

5. A fire-pot constructed of alternate layers of brick or metal and castings, said castings having ribs thereon, forming, in connection with said first-named pieces, conduits for the admission of air to the body and surface of the contents of the fire-pot from an air-space independent of the ash-pit surrounding said fire-pot, all substantially as described, and for the purpose set forth.

6. A fire-pot constructed of alternate layers of brick or metal and castings, said castings having ribs thereon, forming, in connection with said first-named pieces, conduits, in combination with metal casing *d*, surrounding the fire-pot, with a space between the two, casing A, door or damper *a′*, and casing E *e* around said door or damper, extending from casing *d* to casing A, whereby the chamber surrounding said fire-pot communicates with the fire-pot through said conduits, and the open air through said dampers *a′*, all substantially as described, and for the purpose set forth.

GEORGE H. HESS.

Witnesses:
CHARLES T. BROWN,
FRED W. SAWYER.