

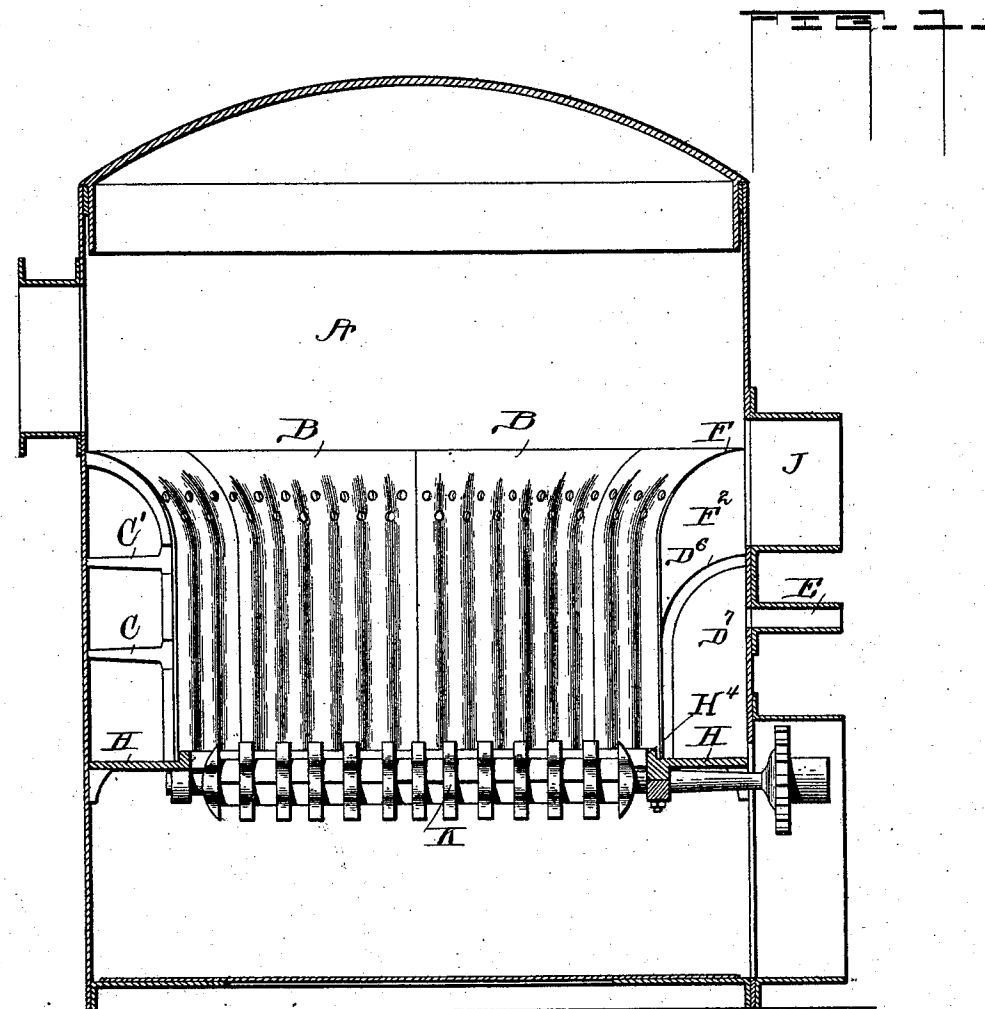
(No Model.)

2 Sheets—Sheet 1.

F. MEYER & G. HARMS.
FURNACE.

No. 576,135.

Patented Feb. 2, 1897.



Witnesses:
Chas. W. La Porte.
Abraham Jacobson

Inventors,
Frank Meyer
George Harms
by W. T. Telford
att'y

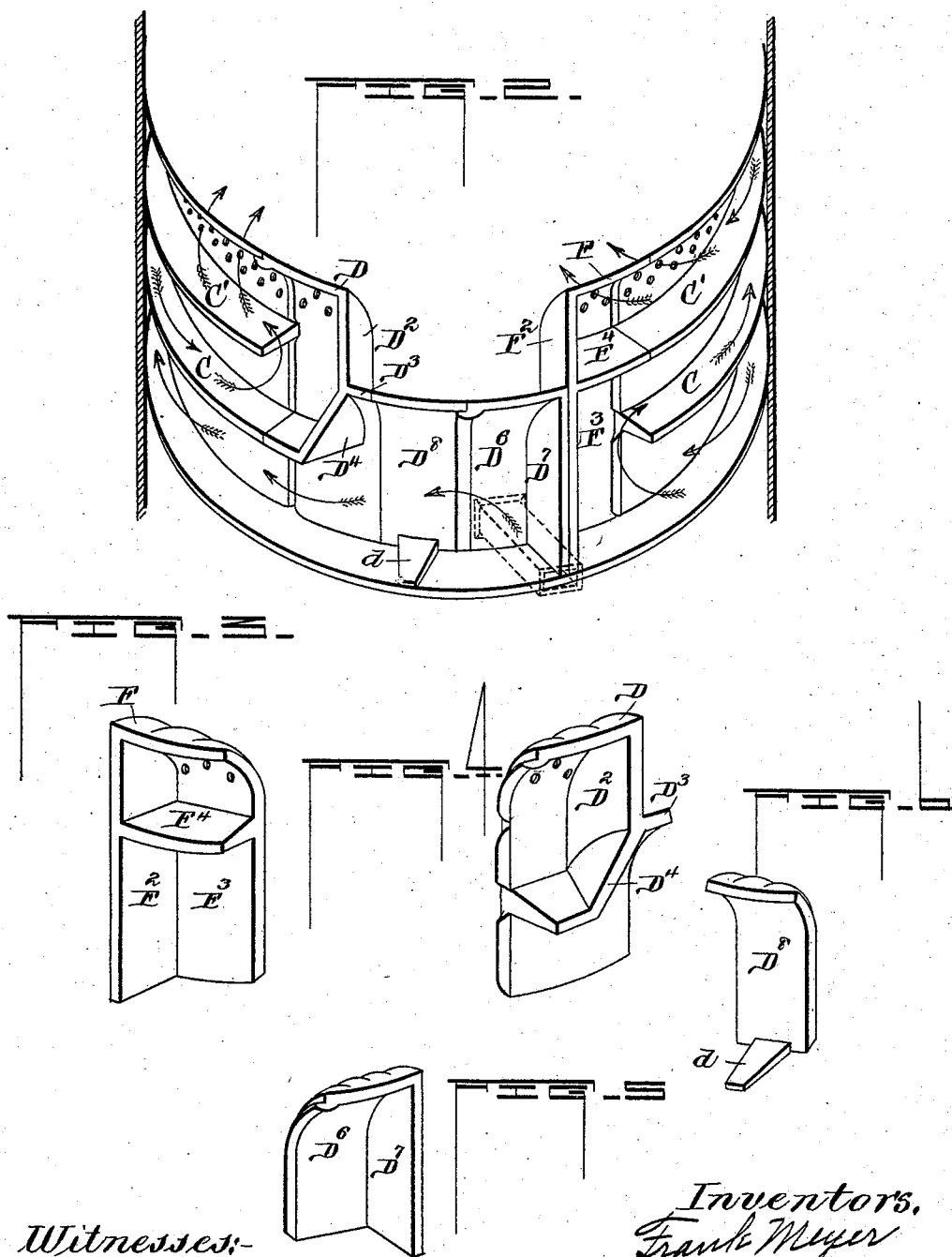
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UNITED STATES PATENT OFFICE.

FRANK MEYER AND GEORGE HARMS, OF PEORIA, ILLINOIS.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 576,135, dated February 2, 1897.

Application filed December 10, 1895. Serial No. 571,692. (No model.)

To all whom it may concern:

Be it known that we, FRANK MEYER and GEORGE HARMS, citizens of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Furnaces; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to certain new and useful improvements in furnaces, stoves, or other heaters by means of which we improve the general efficiency of the same by providing a particular construction of a part thereof.

More particularly our invention relates to the fire-pot of a furnace, stove, or other heating apparatus; and we have for our object to improve the efficiency and increase the durability of that portion of a furnace, stove, or other heating apparatus to which it may be applied; also to so form the fire-pot that air-ducts will be provided in the fire-pot lining to facilitate in the circulation of air around and in contact with the fire-pot lining to equalize the temperature of the said lining or independent parts or sections thereof to prevent the burning or warping of the same, and to heat a body of air by passing it through said ducts and deliver the same properly distributed into the fire-pot at points above the burning fuel to facilitate in the burning of gas liberated by the combustion of the fuel and the consumption of smoke and soot.

Our invention consists in the forming of a fire-pot of separate and independent sections or parts bearing a detachable relation the one to the other, so that portions of the fire-pot may be removed when desired, whether for the purpose of cleaning out the furnace or for replacing sections that have by long use become inefficient on account of burning or other cause without having to take the furnace apart, and also in the formation of the said sections to provide air-ducts around the fire-pot when the sections are put together and properly supported within the furnace, which amounts practically to the addition of flanges to the ordinary fire-pot bearing between the outside wall of the said fire-pot lining and the inner wall of and the inside

face of a wall or cylinder within which the fire-pot is supported to promote the circulation of air around the fire-pot, as has been previously specified, of the particular and detailed formation of the independent sections of the main body of the fire-pot and the detailed construction of the special sections provided to form a doorway, and of certain other details of construction hereinafter more particularly specified and claimed.

That our invention may be more fully understood reference is had to the accompanying drawings, in which—

Figure 1 is a transverse sectional portion of the fire-pot. Fig. 2 is a perspective view of our invention, showing a portion of the fire-pot and showing the matching sections detachably connected with each other and a ring for supporting the lower ends of the sections. Figs. 3, 4, 5, and 6 are perspective views of sections of the fire-pot, adapted when properly matched to produce a doorway and air-chamber under the doorway and for closing the ends of the air-ducts and facilitate in the proper disposition of the currents to cause them to circulate properly around the fire-pot.

In the drawings, A refers to the cylinder or wall designed to inclose the fire-pot.

B designates the sections of the complete device, that are uniform in size and alike in construction and adapted to be assembled, detachably combined, in forming the fire-pot. Each independent section is constructed to form a segment of the complete circle described by the wall of the fire-pot of which it is a part and has the proper lateral curve through the main portion of the body thereof, adapting it to fit within the ring so formed, the main portion of each independent section being made straight vertically and the top portion curved outwardly and flared laterally to adapt it to the larger circle and the extreme upper end thereof curved to form a segment of the complete circle described by this portion of the fire-pot concentric with the circle described by the segments of the lower portions of the sections, each section being provided with flanges suitable for overlapping the meeting sections to facilitate in the more secure attachment of the parts to form the complete fire-pot, but in no way interfering with their separate attachment.

C and C' are rearwardly-extending flanges or extensions bearing at right angles with the body of the segment and integral therewith and are adapted to bear against the inside face of the wall or cylinder A, as shown in Figs. 1 and 2, in such a manner that they will, in combination with the wall C, produce air-ducts between the sections and the wall, through which ducts air can be circulated around the fire-pot, as required, to prevent the sections B from burning and warping, and also for the purpose of heating the air and discharging it into the fire-pot at points around the entire circumference thereof and above the body of burning material being consumed in the fire-pot.

D is a section of our complete device adapted to participate in the formation of an opening or doorway leading to the fire-pot, as shown in Figs. 1 and 2, and also adapted to aid in directing and circulating air that is admitted through duct E, as shown by solid lines in Fig. 1 and by dotted lines in Fig. 2, or in any other suitable way. This section has an integral vertical side portion D², that is adapted to serve as a portion of the wall of the doorway, and a shorter portion D³, having an extension D⁴, that engages the lower extension C of the adjoining section. Said extension D⁴ is inclined, so as to aid in directing the current of air into the fire-chamber under the extension C. The upper extension C' of the same adjoining section B is shorter than the lower extension C, and thereby an opening is provided that allows air to pass over the middle air-chute into the top chute and passage-way, from whence it is distributed through perforations in the curved top portions of the sections B, as required, to promote combustion of the gas and soot from the fuel within the fire-pot.

F is a section adapted in form to aid in producing a doorway and a chute under the doorway. It has integral vertical side portions F² at its top corresponding with the part D² and also adapted to serve as a wall for the doorway. Section F³ is a continuation of section F² and closes the two lower ducts or passage-ways for air, produced by the sections B, having the lateral extensions C and C'.

F⁴ is a lateral extension that abuts against the edge of the extension C' of the adjoining section B and closes the end of the upper air-duct, from which the hot air is distributed to the fire in the fire-pot.

D⁶ is a short section corresponding with sections B in all particulars except as to height, and it has the vertical side piece D⁷, that abuts with the vertical extension F² of section F.

D⁸ is also a short section that matches with short section D⁶ and abuts against the extension D³ from section D, and is provided with the foot-piece d to assist in maintaining the side section firmly in place. These combined sections D⁶ and D⁸ assist in producing the opening or doorway leading into the fire-pot.

H is a metal ring in concentric position with

the cylinder A and is suitably supported therein, and serves as a support for the series of sections B and the sections D and F and the short sections D⁶ and D⁸, and also as a bottom for the lower duct and air passage-way.

J represents a doorway to the fire-pot affixed to cylinder A.

K represents a grate in the bottom of the fire-pot in the same plane of the ring H and in concentric position therewith.

The sections B, D, D⁶, D⁸, and F are preferably made of cast metal in suitable molds, but may be made of fire-clay or other suitable material.

The air-inlet duct E, opening into the passage-way underneath the doorway to the fire-pot, supplies the air designed to circulate through the ducts around the fire-pot and that is ultimately discharged through the perforations in the upper portions of the sections into the fire-pot.

In applying the sections B, D, D⁶, D⁸, and F for practical use they are adjusted within the cylinder A in the manner shown in the drawings, and the edges of the matching sections are made to overlap, as therein shown. The lower ends of the said sections bear upon the ring H and against the flange H⁴ upon the inner circumferential edge thereof, and the upper edges of the sections are caused to bear against the inner face of the cylinder or wall, in this manner forming the complete fire-pot.

The size of the sections is obviously not material, as they can be made of any size required to produce fire-pots adapted for stoves and furnaces of different sizes.

In operation, the parts having been arranged in the relative position shown in the drawings, and air being admitted into the duct under the doorway through the inlet-tube L, as shown in Figs. 1 and 2, will pass through the lower chamber or passage-way to the end thereof, and then upward and backward in the second passage-way to its end, and from thence upward again and into the top duct or passage-way, as indicated by arrows, to be distributed therefrom to the fire through the perforations in the curved top portions of the sections B. The cold air thus admitted and circulated will prevent the sections of the fire-pot from becoming unduly heated and the heat radiated from them will heat the air as it circulates, so that it will be at a high temperature when it is distributed by and discharged from the upper chamber, duct, or passage-way into the fire-pot to promote combustion of the fuel in the fire-pot and of the gases freed by such combustion and of sooty substances produced by such combustion.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. An improved fire-pot for stoves and furnaces comprising a series of sections adapted to rest upon a flat surface and project upward, said sections being square-ended at their lower end portions and perforated and

curved outward at their upper ends and having outward extensions at different points of elevation, the extensions and the top of the sections terminating in the same vertical planes and engaging the inside surface of the cylinder, forming communicating air-chambers which extend horizontally, mating sections having integral side portions adapted to produce a doorway and to close the ends of the upper air-chamber and to also produce an air-chamber under the doorway communicating with the lowest horizontal air-chamber, a flat ring supporting said sections, and a cylinder engaging the outer edges of the upper portion of the sections and the horizontal flanges, and supporting said ring.

2. In a fire-pot for furnaces, the section D having a vertical portion D², a horizontal extension D³, and an inclined portion D⁴, the

section F, having a vertical portion F², the abutting extension D⁶, and the section D⁸, in combination with a series of sections B having lateral extensions C, C', and provided with perforations at their curved end portions, a flat ring to support said sections and a cylinder to inclose all of said sections, as shown and described to produce a doorway and communicating chambers extending horizontally from the chamber under the doorway for the purposes stated.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK MEYER.
GEORGE HARMS.

Witnesses:

HENRY MANSFIELD,
CHAS. W. LA PORTE.