

W. ENNIS.

Fire Pot for Stoves, &c.

No. 47,895.

Patented May 23, 1865.

Fig. 1.

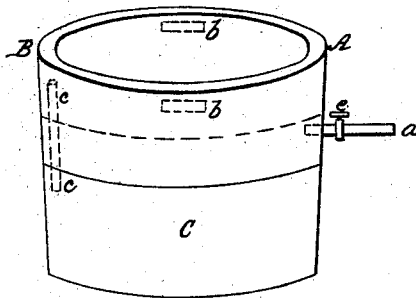


Fig. 2.

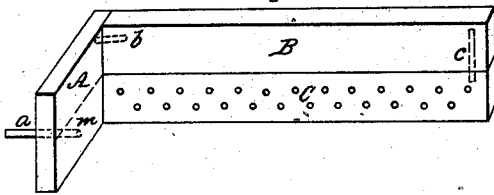
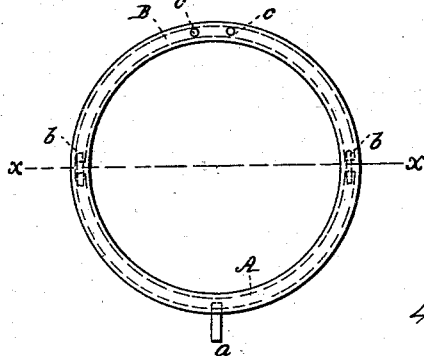


Fig. 3.



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Fig. 4.

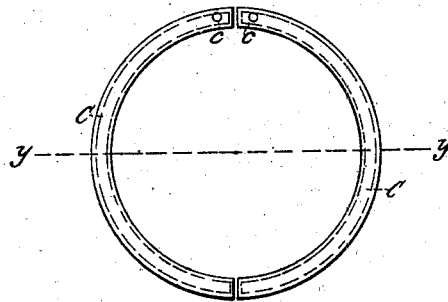


Fig. 5.

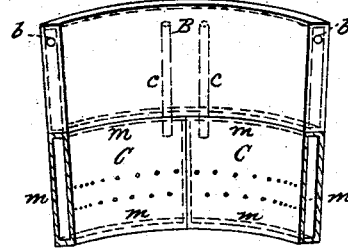


Fig. 6.

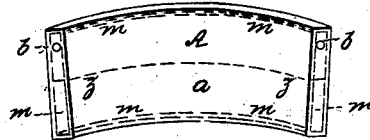
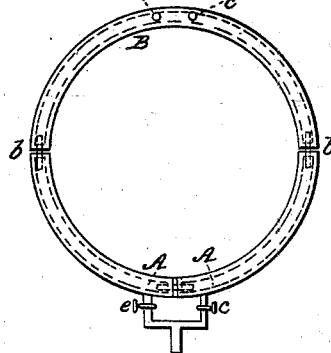


Fig. 7.



Witnesses:

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Chas. L. Fowler

Inventor:

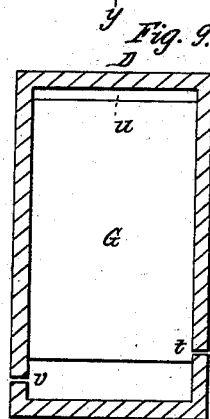
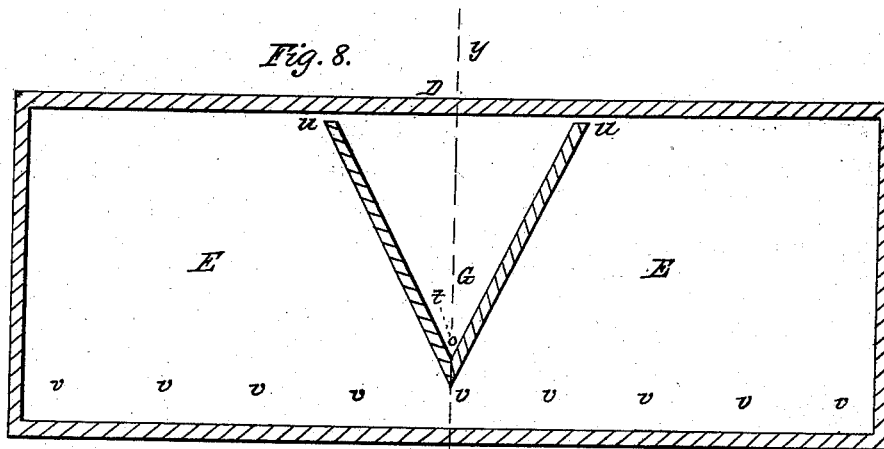
William Ennis

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Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

WILLIAM ENNIS, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND
OSBORNE MACDANIEL, OF SAME PLACE.

FIRE-POT FOR STOVES, &c.

Specification forming part of Letters Patent No. 47,895, dated May 23, 1865.

To all whom it may concern:

Be it known that I, WILLIAM ENNIS, of the city, county, and State of New York, have invented a new and improved mode of constructing fire-pots and retorts for stoves, ranges, and furnaces, and generating steam for the promotion of combustion therein; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings which form a part of this specification.

Figure 1 is a perspective view of a fire-pot or lining for a heating stove or furnace for houses. (See Sheet of Drawings No. 1.) Fig. 8 is a vertical lateral section of a straight retort for a cook stove or range designed to be placed on one or more sides of a fire-chamber, which exhibits the sections or steam-chambers, formed by partitions in a single hollow casting, one of which is used for generating, and the others for the superheating and discharging, the steam into the fire. Fig. 9 is a vertical transverse section of the same, drawn through the line *y y*, Fig. 8. Fig. 2 is a perspective view of a fire-pot or lining for a cook stove or range. Fig. 3 is a plan of the upper part of a round fire-pot. Fig. 4 is a plan of the lower part of a round fire-pot. Fig. 5 is the vertical section of a fire-pot in the line *x x*, Fig. 3, showing the concave side and the ends of section B, and the line *y y*, Fig. 4, showing sectional divisions of sections C C, Fig. 4. Fig. 6 is a view of the concave side and ends of section A, Fig. 3, showing the steam-chamber *m* within and the water-level on the line *z z*. Fig. 7 is a plan of the upper part of a round fire-pot divided into three sections instead of into two, as in Fig. 3. (See Sheet of Drawings No. 2.)

The nature of my invention consists in a new mode of constructing fire-pots, retorts for stoves, ranges, and furnaces for generating steam directly in the pot or retort itself instead of employing an independent boiler for the purpose, the pot-retort being made of hollow cast-iron sections connected with pipes, and so formed and arranged that steam is made in the chamber or chambers of one or more sections and conveyed into the chamber or chambers of one or more other sections in which it is superheated, and thence in a superheated condition into the chamber or

chambers of other sections, from which it issues in small jets through holes on the interior of the pot-retort into the fire, for the promotion of combustion, under the Letters Patent granted to William E. Hagan, March 8, 1864, or otherwise constructed by making the pot or retort of one or more cast-iron sections united by screw-bolts to form one piece, or in one hollow casting divided by partitions into chambers, which communicate with each other by pipes or openings, and have the same uses as when formed in separate sections of cast-iron, the chambers in which are connected by means of pipes only, as described above, by means of which improvement I am enabled to furnish a regular and uninterrupted supply of steam to the fire in a stove, range, or furnace graduated in quantity as desired by the flow of water led by a feed-pipe into the steam-chamber, thus securing higher utility and effecting great economy in the application of superheated steam for the promotion of combustion in stoves, ranges, and furnaces.

To enable others skilled in the arts to make and use my invention, I will proceed to describe its construction and operation.

Section A, Figs. 2, 3, and 6, is the steam-generator, the steam-chamber *m* within being shown in Fig. 6, which is supplied with water by the feed-pipe *a*, the flow of the stream being graduated by a stop cock or valve or controlled by a feed-regulator, so that the water shall not rise above a certain level indicated by the line *z z*, Fig. 6, in the steam-chamber, the water being taken from a service pipe or tank.

Section B, Figs. 2, 3, and 5, is the superheater, into which the steam is conveyed directly from the steam-generator A by the pipe *b*.

Sections C C, Figs. 2, 4, and 5, are the distributors, into which the superheated steam is conveyed by the pipes *c c*. The pipes *c c* are made long enough to rise nearly to the top of the chamber in the superheater, as shown in Fig. 5, for the purpose of guarding against the passage of water into the distributors C C by any accidental overflow of the steam-chamber *m*.

The material and mode of constructing the distributors C C may be modified advantageously, perhaps, in some cases, in which,

as in furnaces, a very intense fire is required, by forming them of fire-brick or soapstone, and instead of making them with chambers inside, with small holes for the superheated steam to issue into the fire, have each section perforated with two or more holes, into which are conducted small pipes leading the superheated steam from the superheater into the fire. The pipes *b* and *c* are screwed into the castings at one of their ends, and at the other ends are fitted tightly into their corresponding holes, and stuffed with red lead and iron filings when the sections of the fire-pot are put together. Thus connected and locked together, the sections of the fire-pot or retort will remain firm in their place and form the pot-retort to be set in the stove or furnace.

The castings of the sections of the fire-pot may be made from one to three inches thick, according to their size and the use to which they are to be applied, and the cavities or chambers within them may be from a quarter to three-quarters of an inch wide, having greater substance on the inside than the outside, and the distributors may be made thicker than the steam generator and the superheater, allowing the substance of iron on the inside an inch or more in thickness, as a better protection against the action of an intense fire. The substance of iron left at the ends and top and bottom of the sections of the pot may be an inch or more in thickness.

In some instances it may be advisable to have a smaller steam-generator than the segment of the circular pot *A*, and it may be divided into two parts, *A A'*, Fig. 7, making section *A* the steam-generator, and section *A'* an additional superheater. When this is done, the feed-pipe *a* may be branched, and provided with stop cocks *e e*, Fig. 7, to admit water into each part, so that one or both parts may be used as steam-generators, as may be required.

In Figs. 8 and 9 is seen a straight retort, *D*, which is cast in one piece, and designed for the fire-chamber of a cook stove or range. It is divided into sections or chambers by the partitions *pp*, of which *G* is the steam-generator and *E E* superheating and distributing chambers, the water being conveyed by a pipe

through the hole *t* into the chamber *G*, and the steam being generated therein is admitted through spaces *uu* at the top of the partitions *pp* into the chambers *E E*, and, being therein superheated, is discharged through the holes *v v v v* into the fire.

My invention is not limited in its application to any particular form or kind of fire-chamber or furnace, but may be adapted to and used in all kinds and forms of furnaces and fire-chambers, and retorts may be placed at the sides or in the body of a fire.

Having thus described the construction and operation of my invention, disclaiming the use of superheated steam to promote combustion and the division of a fire-pot into hollow segments or sections, of the prior use of which I am aware, and especially distinguishing my invention from the construction of fire-pots in hollow sections, one of which is employed as a water-leg or water-back, having pipes connected with an independent boiler for the heating of water and the generating of steam, which is led thence by a pipe into a superheating section of the pot and thence into a distributor, all of which devices and arrangements have been previously employed by others.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The method of generating steam in the fire-pot retort itself, as and for the purpose herein described.
2. The construction of the steam generator *A*, combined with the feed-pipe *a*, leading into the steam-chamber *m*, and the escape-pipe *b*, leading into the superheater *B*, as and for the purpose herein described.
3. The combination of the steam-generator *A*, the superheater *B*, and the distributors *C C*, connected with the pipes *a*, *b*, and *c*, as and for the purpose herein described.
4. The construction of a retort divided by partitions into chambers or sections formed of one or more pieces, as and for the purpose herein described.

WILLIAM ENNIS.

Witnessed by—

A. D. PLATT,
J. M. STAPLES.