J. F. PRATH. 2 Sheets—Sheet 1.

KETTLE-FURNACE.

No. 191,465. Patented May 29, 1877.

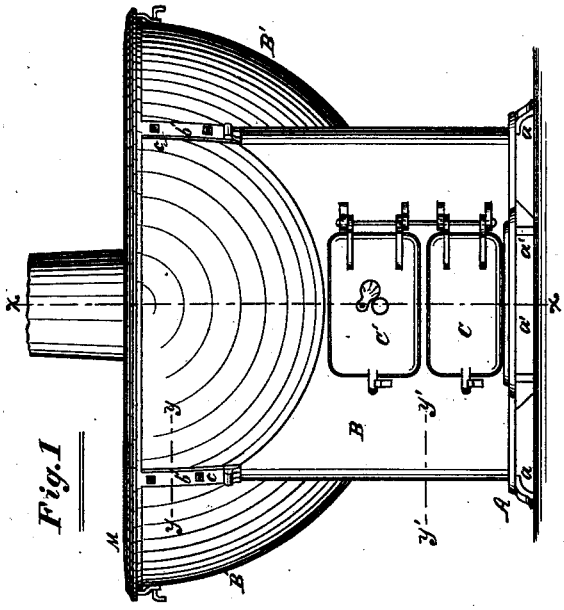

Fig. 1

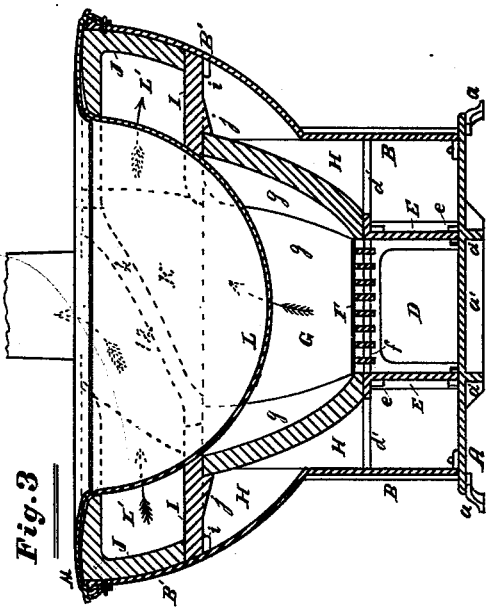

Fig. 3

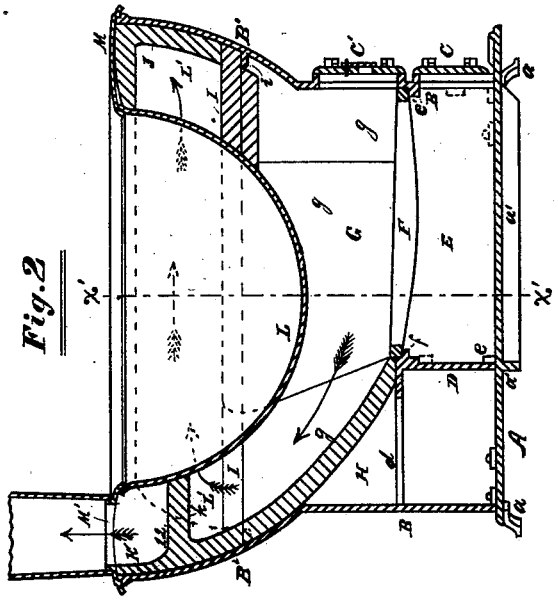

Fig. 2

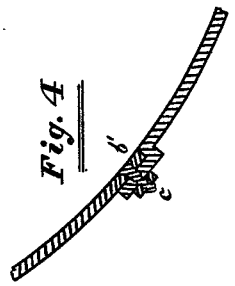

Fig. 4

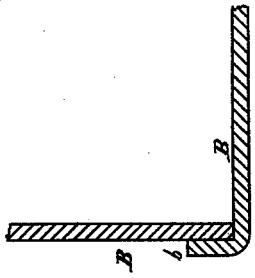

Fig. 5

Attest

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H. L. Warner

INVENTOR

John F. Prath

2 Sheets—Sheet 2.

J. F. PRATH.

KETTLE-FURNACE.

No. 191,465. Patented May 29, 1877.

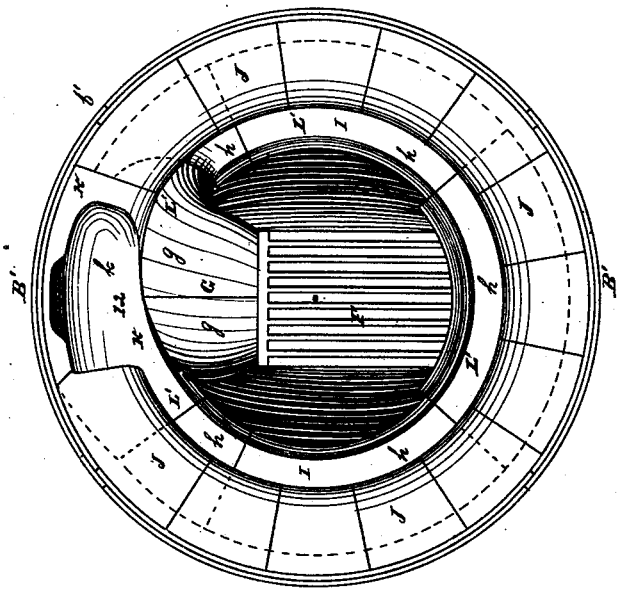

Fig. 6

Fig. 8

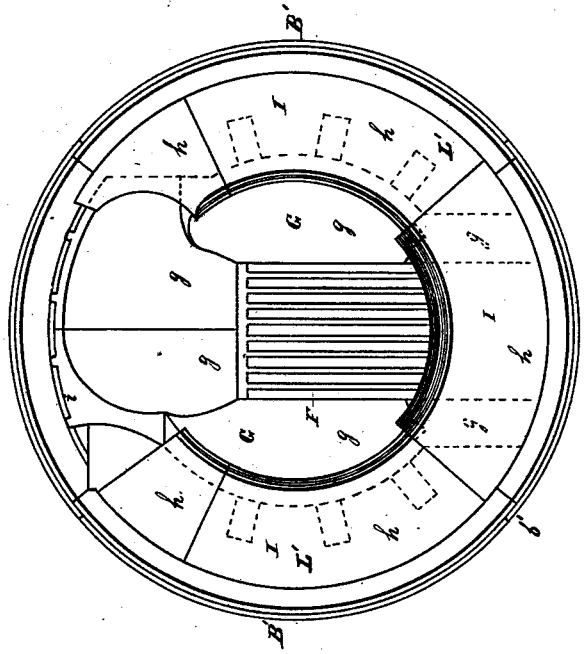

Fig. 7

Attest

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JOHN F. PRATH, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN KETTLE-FURNACES.

Specification forming part of Letters Patent No. **191,465**, dated May 29, 1877; application filed December 26, 1876.

To all whom it may concern:

Be it known that I, JOHN F. PRATH, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Kettle-Furnaces, 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 said improvements, reference being had to the accompanying drawing, forming a part hereof, and in which—

Figure 1, Sheet 1, is a front elevation of my improved furnace. Fig. 2, Sheet 1, a vertical central section thereof in the plane of the line *x x*; Fig. 3, Sheet 1, a like representation in the plane of the line *x' x'*; Fig. 4, Sheet 1, a horizontal section, representing the construction of the joints of the outer wall of the furnace, at the elevation indicated by the line *y y*; Fig. 5, Sheet 1, a like representation at the elevation indicated by the line *y' y'*; Fig. 6, Sheet 2, a top or plan view of the furnace when the cap and kettle are removed; Fig. 7, Sheet 2, when the parts forming the worm-flue are removed; and Fig. 8, Sheet 2, a front elevation of the rear flue-block.

Like letters of reference indicate like parts.

In the drawing, A represents the platform or base of the furnace, which is preferably supported on the legs *a a*, and strengthened by the cross-ribs *a' a'*. B B are the vertical walls of furnace. The upper parts of these walls bulge outwardly, as represented at B' B', so as to approximate to the form of an ordinary hemispherical kettle. Each vertical side, of which there are four, together with its bulging part, consists of one piece, and these parts are made to overlap each other along their vertical edges, as shown at *b b'*, respectively, and are fastened together, preferably, by means of screws *c c* passing through the joints at *b' b'*. The front wall is supplied with doors C C' for access to the ash-pit and fire-pot, respectively. By this means the outer walls of the furnace may be readily arranged together and taken apart, and are firmly and tightly held when set up. They may be securely attached to the base A in any suitable manner when the parts are arranged together for use.

D is the rear wall of the ash-pit. This part is prevented from being moved laterally and rearwardly by means of the horizontal arms *d d'* extending to the rear and side walls B B, respectively. E E are the side walls of the ash-pit. The parts E E are retained in a vertical position by means of the lugs *e e'*. F is the grate. This part rests on the supports *f f*, and is prevented from lateral motion by the side walls E E, and rearward motion is prevented by the wall D, and forward motion by the front wall B. The grate and all the walls of the ash-pit are removable.

G is the fire-pot. This chamber is constructed of separate parts *g g*, made of the material of which fire-bricks are made. The lower edges of the parts *g g* rest upon the upper edges of the walls of the ash-pit, and the grate serves as a stop or shoulder to keep the lower edges in place. The front and rear pieces *g g* also rest against the outer walls of the furnace. The joints or adjacent edges of the parts *g g* are also such as to prevent the collapse of the wall thus formed. All the parts *g g* are removable. The pot thus formed is open at the front to receive the fuel, and the rear pieces *g g* are inclined as indicated in Fig. 2. By this means a space or chamber, H, is formed between the outer walls and the fire-pot.

I is a diaphragm extending across and covering the chamber H. This diaphragm is made of the pieces *h h*, which are of the same material of which the parts *g g* are made. The outer edges or parts of the blocks or pieces *h h* are curved, and rest upon the supports *i i*, and the inner edge or part of the diaphragm thus formed rests upon the upper edge or top of the fire-pot, and is curved to correspond to the form of the said pot. The ends of the pieces *h h* are formed to lie in radial lines, as shown, so that said pieces will remain in their proper places, and not be crowded inwardly. I deem it best to have the diaphragm I project a little way into or over the fire-pot, so that the projecting part may be clipped off, if necessary, to receive the kettle nicely. *j j* are brackets on the side pieces *h h* to aid in keeping the side pieces *g g* in place. I make the front piece *h* thicker than the others, to en-

dure the greater exposure to heat to which it is subjected on account of its position. All the pieces *h h* are removable.

J J are rectangular pieces, made preferably of fire-brick clay. The backs of these pieces are in contact with the walls B′ B′, and are fitted thereto. The lower edges of the vertical parts or backs of the pieces J J rest upon the diaphragm I, while the upper or horizontal parts extend inwardly from the walls B′ B′, and terminate in a circle somewhat larger than the inner circle formed by the diaphragm I. The horizontal adjacent edges of the pieces J J lie in radial lines, as shown. The upper interior edges of the pieces J J should be beveled or rounded off for the reception of the kettle. K is an irregularly-formed piece, serving as a lining to that part of the rear wall not already lined by the parts described. *k* is an inclined diaphragm extending horizontally and inwardly from the part K, of which it is a part. L is the kettle. This kettle is removable, and is supported by the rims formed by the fire-brick blocks. It will be perceived from the foregoing description, and by reference to the drawings, that the fire-brick blocks are contiguously arranged, and that this contiguity, in connection with their peculiar construction and arrangement, forms a wall, which, with the exception of the joints between the removable blocks, is continuous, and constitutes at once the fire-pot, the lining for the outer wall, and a worm-flue, L′, around the kettle. An air-chamber also surrounds the ash-pit and the fire-pot.

M is a removable annular cap covering the upper faces of the blocks J J, and having therein an opening, M′, to receive a smoke-flue or pipe. One end of the flue L′ terminates at the opening M′, and the other enters the fire-pot. I deem it preferable to make the rear end of the grate a little higher than the front end.

Any of the fire-bricks or blocks may be readily duplicated if they should be broken or injured, and I deem it best, in order to facilitate the arranging and replacement of the blocks, to number them with regularity. Some of the blocks, as, for example, at 12, which are greatly exposed to heat, or are liable, on account of their exposed position, to be broken, may be made of iron.

A furnace thus constructed may be shipped with facility from place to place, for the reason that it may be compactly arranged for transportation, and readily set up when it reaches its destination. The outer walls are greatly protected from the heat, but the kettle is exposed to intense heat. The fire-brick or blocks also retain for a long time the heat imparted to them, and there will be a saving in fuel on this account, and on account of the intense heat upon the kettle caused by the worm-flue surrounding it.

The precise construction of fire-blocks herein shown is not essential.

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

A worm-flue kettle-furnace, wherein the said flue, the fire-pot, and the lining for the outer walls consist of removable fire-proof blocks consecutively arranged and matched together, substantially as and for the purposes specified.

JOHN F. PRATH.

Witnesses:
JOHN WALTER,
F. F. WARNER.