

(No Model.)

C. M. BAXTER.
HOT AIR FURNACE.

No. 331,025.

Patented Nov. 24, 1885.
Fig. 1.

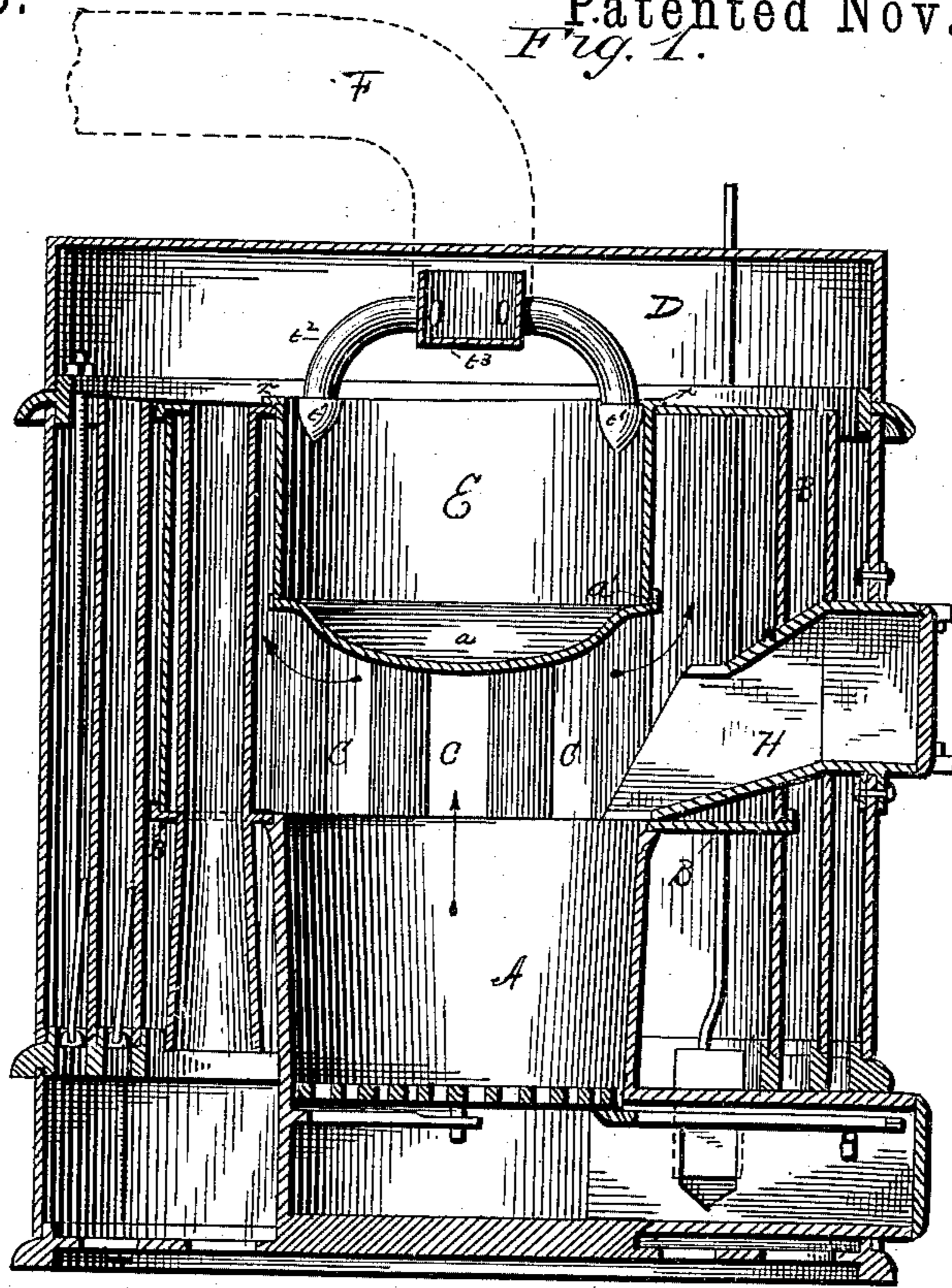


Fig. 2.

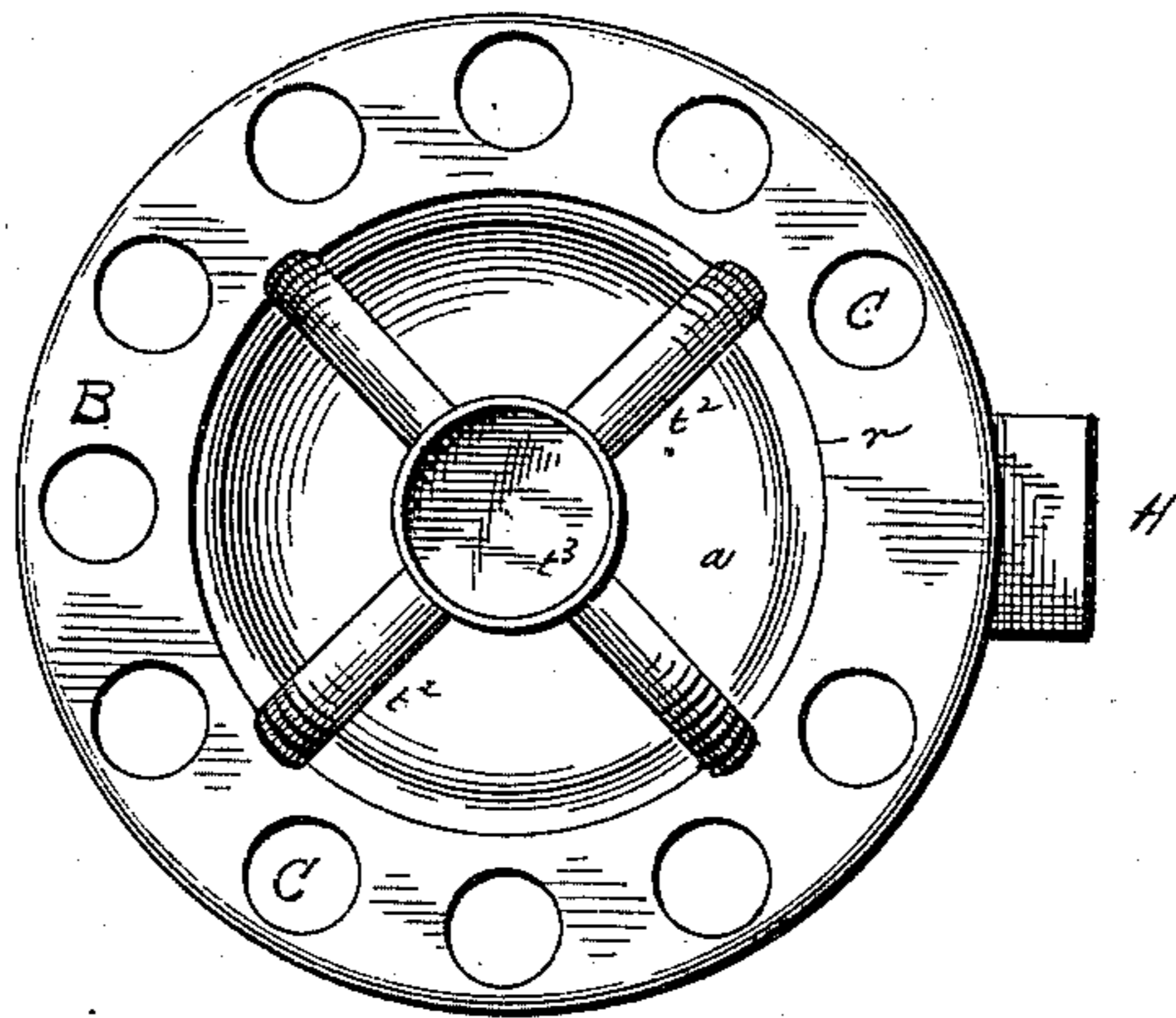
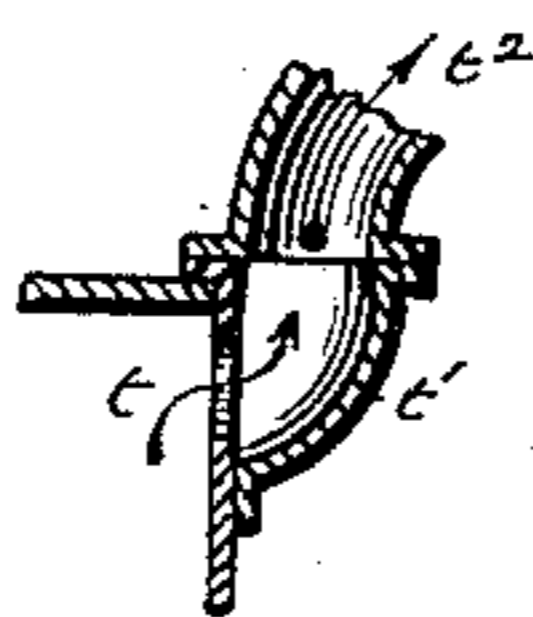


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 331,025, dated November 24, 1885.

Application filed April 22, 1885. Serial No. 163,041. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. BAXTER, a citizen of the United States, residing at Lebanon, in the county of Grafton and State of New Hampshire, have invented certain new and useful Improvements in Hot-Air Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

The object of my invention is to improve the construction shown in Reissue Patent No. 8,822, granted to me July 29, 1879.

My invention consists in combining with the fire-pot, the shell and its concentric air-pipes, and the hot-air chamber a kettle-shaped radiator provided with a convex bottom terminating in a flange, for directing the heat outward centrally among the air-pipes and the walls of the shell, and having an open top to permit the heat inside the radiator to pass directly into the hot-air chamber, said radiator being further provided with openings and chutes at the top, whereby the smoke and volatile products of combustion pass through the radiator-walls into pipes arranged over it and within the hot-air chamber.

In the drawings, Figure 1 is a central vertical section of the furnace with the improvement. Fig. 2 is a plan view of the shell, the radiator and its smoke, &c., exit pipes, and the fuel-chute removed from the furnace. Fig. 3 is a detail view in vertical section, showing the manner in which the smoke, &c., escapes through the wall of the radiator into the exit-pipes.

Like letters refer to like parts.

As the same furnace shown in the above patent is used, it will not be necessary for the purposes of this case to redescribe it wholly. A represents the fire-pot. Resting upon it is the shell B, or the chamber which receives the products of combustion rising from the former. The fuel-chute H passes through the wall of the shell, which has also vertical air-pipes C C concentrical with it. Said pipes are open at both ends, and extend from the hot-air chamber D at the top of the furnace down to and

around the fire-pot. The former dome of the shell and the dome-radiator depending from it are dispensed with in this improvement, it being found that the inverted cup soon burned out without radiating much heat. In its place the wide kettle-radiator E, with straight sides, is substituted, which is open at the top and closed at the bottom by convex or disk-shaped deflector *a*, terminating in a circular flange or flare, which aids materially in directing the products of combustion outward, and keeps them from following up the sides of the radiator *a'*. The bottom of the radiator may, however, be flat or concave. By means of a circular flange, *r*, resting on the top of the shell, this radiator depends well down within the latter, and inside the circle of pipes C C, leaving little space between it and said pipes, and directing the heat centrally among them. Near the flange *r* the wall of the radiator is perforated in four opposite places, (see *t*, Fig. 3.) Each of these openings is surrounded by a small chute, *t'*, on the inside of the radiator, and from the top of the chutes pipes *t'' t''* (see Figs. 1 and 3) extend to a pipe-socket, *t''*, in the hot-air chamber. This socket has four openings to correspond to the pipes, and is adapted to joint with an exit-pipe, F, (see dotted lines, Fig. 1,) which leads to the chimney. Hence it will be seen how the smoke and volatile products of combustion collecting about the top of the shell B escape.

Though the kettle or radiator is shown as depending half-way within the shell, I do not desire to limit myself as to its height above the fire-pot or its dimensions, and it is evident that the number of openings *t t* and pipes *t'' t''* may be varied.

The operation of the radiator possesses advantages over that shown in the above patent. The products of combustion, striking the convex bottom and the flange or flare *a*, are directed centrally outward between the air-pipes, the outside of the radiator, and the shell, heating all these parts intensely, at the same time the non-combustible products being finally allowed free egress to the chimney. The radiator, being kettle-shaped, not only deflects but radiates heat from its whole surface, some of which passes directly from its open mouth into the hot-air chamber above, adding to the effect of the vertical air-pipes and the shell. Not

collecting the products of combustion, as an inverted cup does, it will not easily burn out, and when a new one is required it can easily be inserted at small cost.

5 I am aware that conical frustums have been used as radiators in connection with concentric air-pipes and a surrounding shell, and disclaim such. Said frustums, either on account of their pointed bottom or tapering sides, direct the
10 heat upward between them and the pipes without radiation; or, if there is any, it is near the top, not centrally to the pipes and shell, as I do. Besides, these frustums are too narrow to come near enough to the air-pipes, or they de-
15 pend so little from the top of the shell as to add nothing, if they do radiate, to the pipes, which have been intensely heated below. None of them, so far as I know, shows a flange on the bottom for guiding the products of combustion
20 outward and away from the sides of the radiator. I am also aware that an arrangement of exit-pipes resembling mine has been used; but as they were not surrounded by a hot-air chamber the heat passed away, or was, contrary to
25 its natural direction, forced down through a large and objectionable pipe having exit at one

side of the fire-pot, said pipe being an obstruction to the other parts. In my combination the heat in the bent pipes will add to the effect of the hot-air chamber, which is an important
30 advantage, as it adds to the effect of the furnace.

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

35 The combination of the kettle-radiator E, having convex flanged bottom *a*, openings *t t*, and chutes *t' t'*, with the pipes *t² t²*, perforated pipe-socket *t³*, and exit-pipe F, the hot-air chamber open over the radiator and inclosing
40 pipes *t² t²*, the shell B, provided with interior air-pipes, C C, opening into the hot-air chamber and extending down to and around the fire-pot, and the said fire-pot, substantially as set forth.

45 In testimony whereof I affix my signature in presence of two witnesses.

CHARLES M. BAXTER.

Witnesses:

C. A. DOLE,

O. A. JOHNSON.