

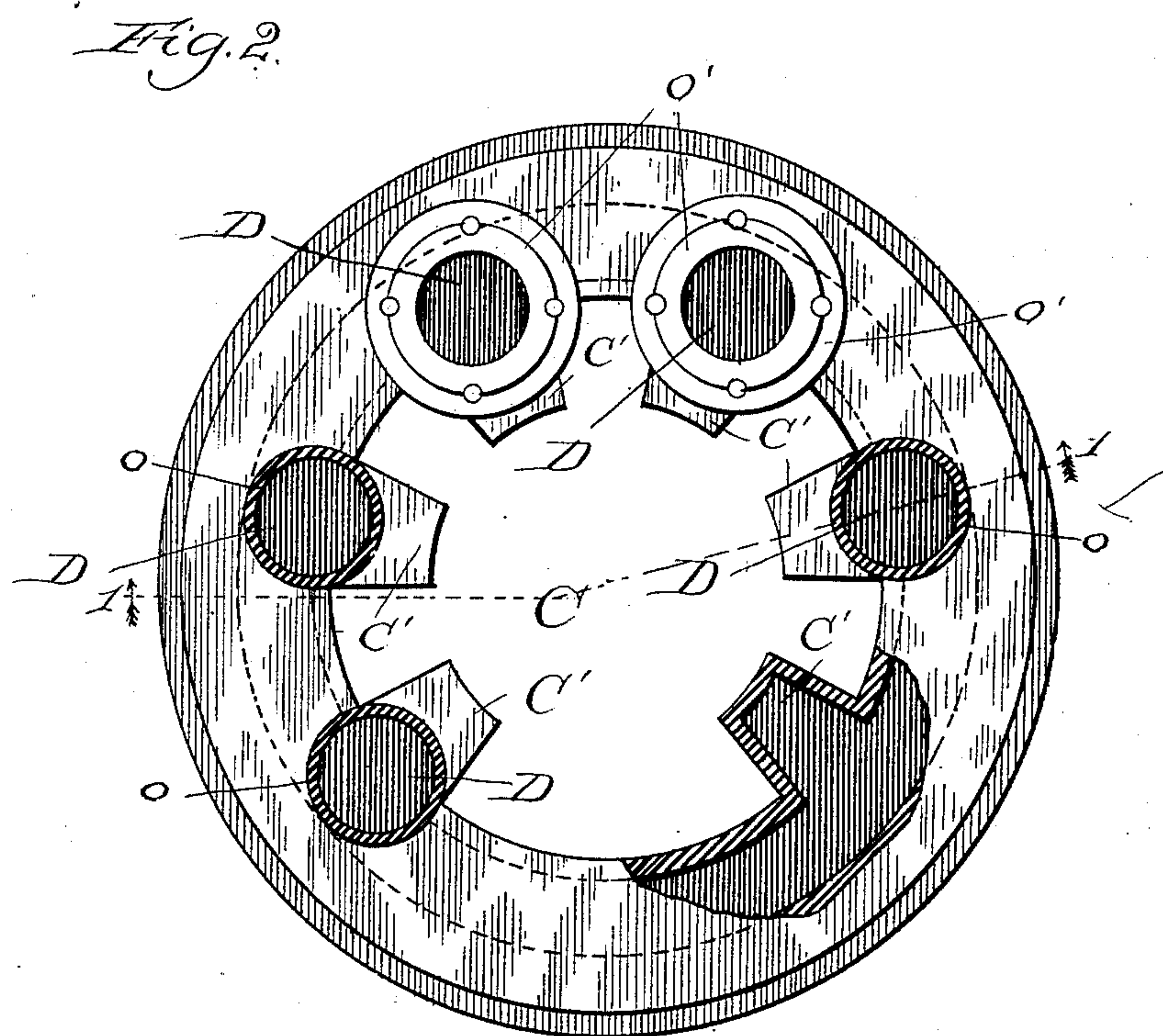
(No Model.)

2 Sheets—Sheet 2.

R. F. BROWN.
FURNACE.

No. 348,885.

Patented Sept. 7, 1886.



Witnesses:
Chas. E. Gaylord
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UNITED STATES PATENT OFFICE.

ROYAL F. BROWN, OF CHICAGO, ILLINOIS.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 348,885, dated September 7, 1886.

Application filed September 21, 1885. Serial No. 177,753. (No model.)

To all whom it may concern:

Be it known that I, ROYAL F. BROWN, 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 Furnaces; and I hereby declare the following to be a full, clear, and exact description of the same.

My improvements relate particularly to the class of furnaces employed for heating apartments by the circulation of heated water passing through them in pipes, which circulation is produced by the expansive effect upon the water of the heat in the furnace.

It is my object to provide a construction of furnace whereby the heating of the water shall be accomplished more rapidly and by the use of less fuel than is possible with other constructions of furnaces known to me, and also to permit, when desired, hot air to be employed as an additional medium of heating.

To these ends my invention consists in the particular construction and combination of parts, all as hereinafter more particularly set forth and claimed.

Referring to the drawings, Figure 1 is a vertical sectional view of my improved furnace, taken on the line 1 1 of Fig. 2; and Fig. 2 a plan view of my improved heater having a portion broken away better to illustrate the construction.

A is the usual sheet-metal shell supported upon legs *r*, and containing the grate *g*, ash-pit *p*, fire-chamber B, and other parts of the construction common to furnaces, and parts of novel construction, hereinafter described.

Surmounting the fire-chamber B is an annular reservoir, C, affording the heater, (see Fig. 2,) provided with pockets C', preferably of the form shown, and extending laterally toward a common center from the inner surface of the ring, and D D are circular openings formed in the upper surface of the heater at the pockets C', and provided with flues or conduits *o*, having flanges *o'*, to afford a seat for the main reservoir or dome E, hereinafter described.

The reservoir E comprises, preferably, the form shown in Fig. 1 of the drawings, and is provided with tubular openings *o''* around its under surface to coincide with the openings

D in the heater, and having flanges *o''*, which are bolted, as shown in Fig. 1, to the flanges *o'*. An annular plate, *n*, surrounds the heater C, being supported upon a seat, *n'*, extending laterally from the upper edge of the heater, and affords a seat and bottom to the radiator F, comprising a cylindrical shell, *m*, preferably of sheet metal, surmounted by a cover, *m'*, of thicker metal, from which the smoke-flue G leads, and the position of the radiator F affords an air-chamber, H, which surrounds it, and fulfills a purpose hereinafter described. Water-pipes I lead from the top of the reservoir E, through the upper sides of the radiator F and shell A, and extend into the apartments to be heated, all in the usual way, and return to the heater C, penetrating the same and shell A, as pipes I'.

To prepare the device for operation the reservoir E, conducting-pipes, and heater C are filled with water, which is heated by the hot products of combustion which arise from the fire-chamber B and escape through the smoke-flue G, passing on their way to the latter through the annular heater C, about the pockets C' and radiator F, thus enveloping the reservoir E, and heating the air contained in the chamber H, which heated air may, as is commonly practiced by me, be conducted away through flues K and utilized to heat apartments. By the construction of the heater C, the pockets of which afford projecting surfaces in contact with the products of combustion where the latter are at their highest temperature, the water, as it is returned by way of the pipes I' in a cooled condition, is heated without the employment of an unusual quantity of fuel as rapidly as is required to maintain a constant supply of hot water to the apartments to be heated, the other features of the radiator F and reservoir E assisting in the rapid attainment of heat, whereby the expansion of the water produces the required circulation, and hot air is also afforded to be employed as an additional heating medium without necessitating the burning of extra fuel to produce it.

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

A hot-water furnace comprising, in combination with the shell A, grate *g*, ash-pit *p*,

and fire-chamber B, an annular reservoir, C, provided with pockets C', a dome, E, conduits 10, supporting the dome and communicating with the latter, and the pockets C' at opposite 5 ends, a radiator, F, surrounding the dome E, within the shell A, and affording an air-chamber, H, provided with openings K, a water-pipe, I, leading from the dome E and return-

ing to the heater C, and a smoke-flue, G, leading from the radiator F through the shell A, the whole being constructed and arranged to operate substantially as described.

ROYAL F. BROWN.

In presence of—

MASON BROSS,

W. M. BOYD.