No. 620,874. Patented Mar. 14, 1899.

D. E. AUSTIN.

HEATER.

(Application filed Apr. 4, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 5.

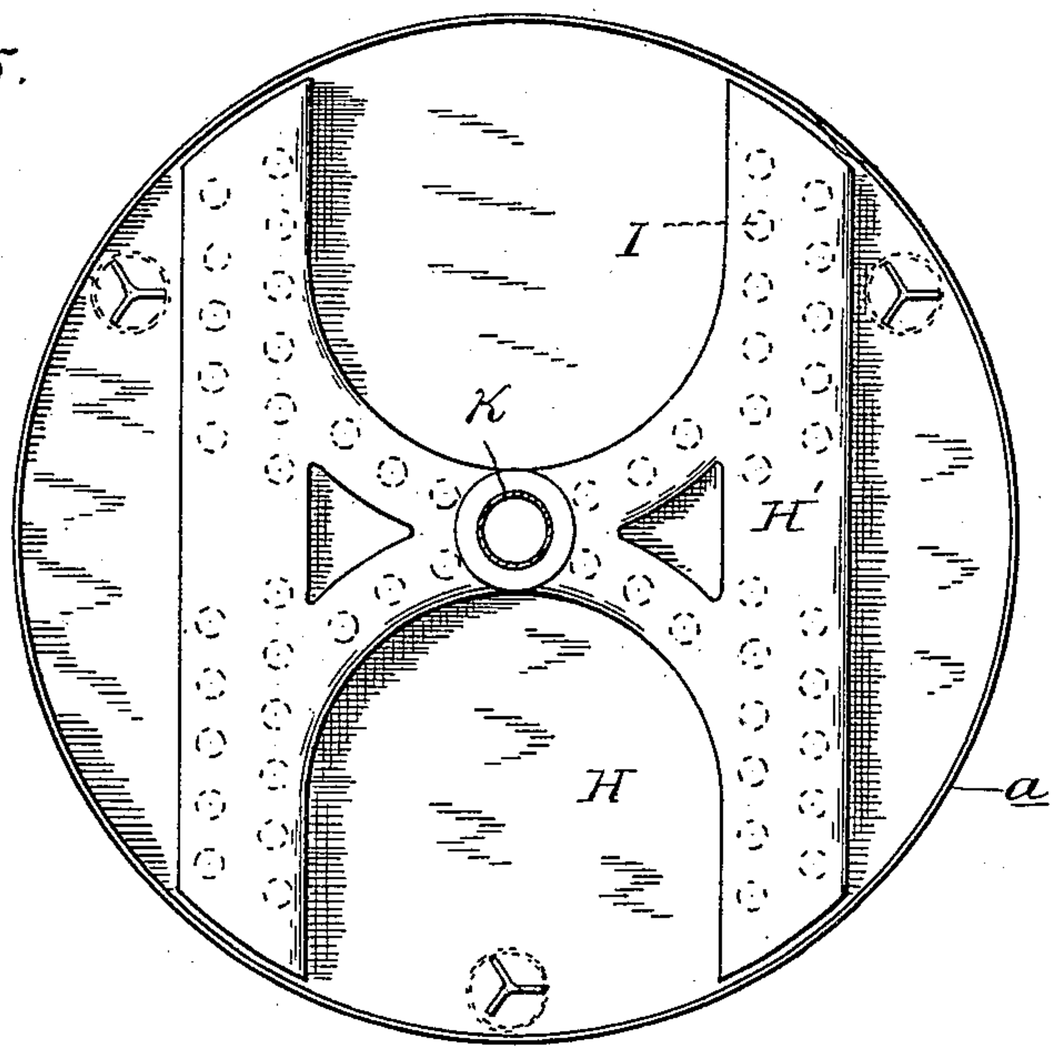
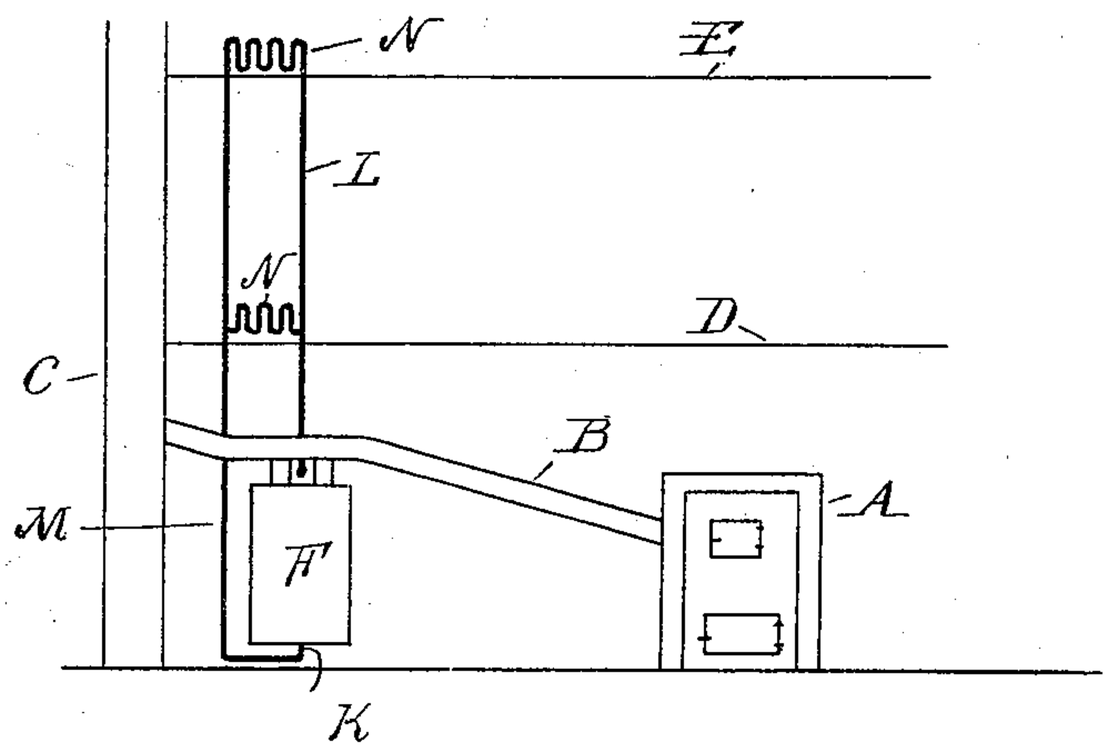


Fig. 1.



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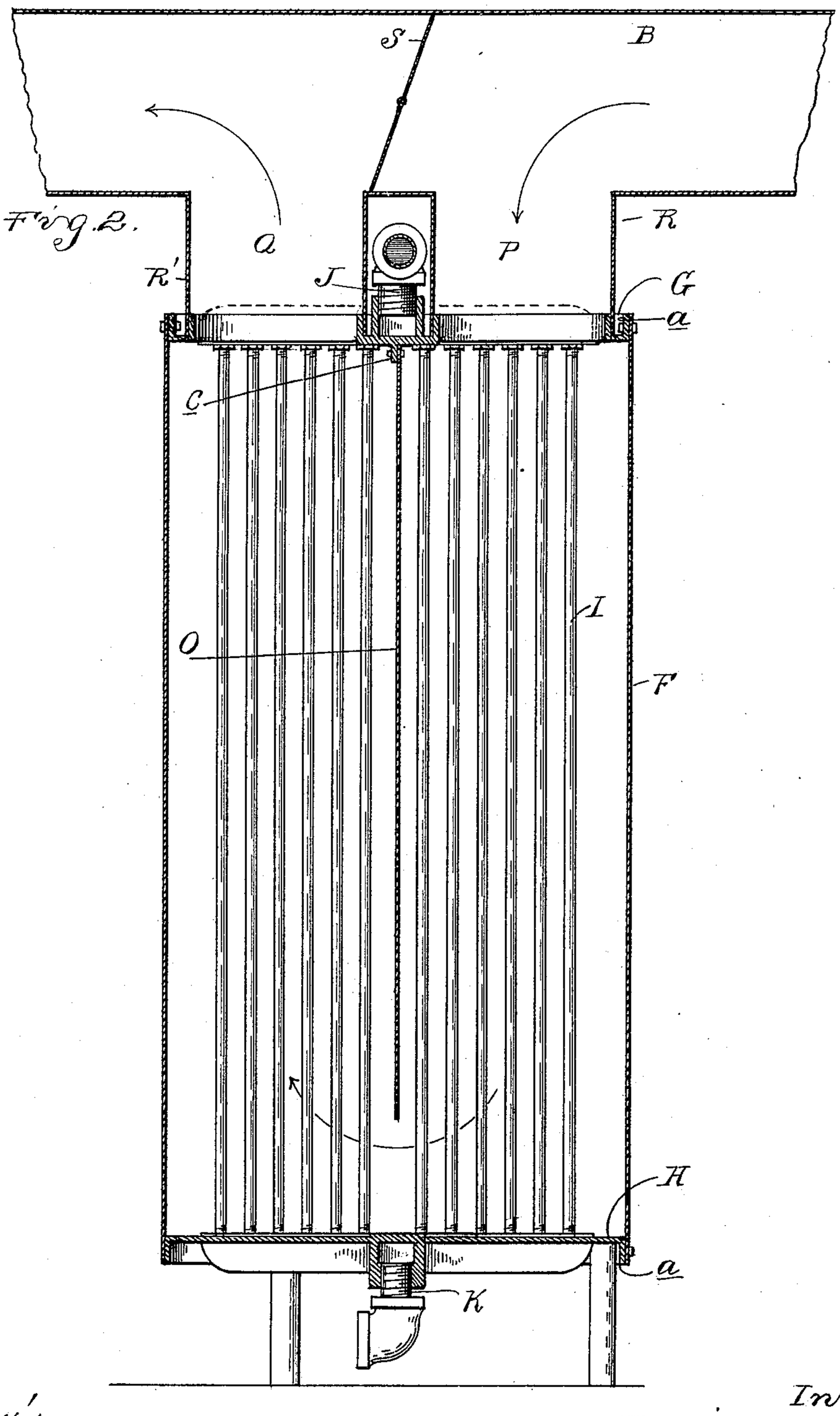
(No Model.) 3 Sheets—Sheet 2.

Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

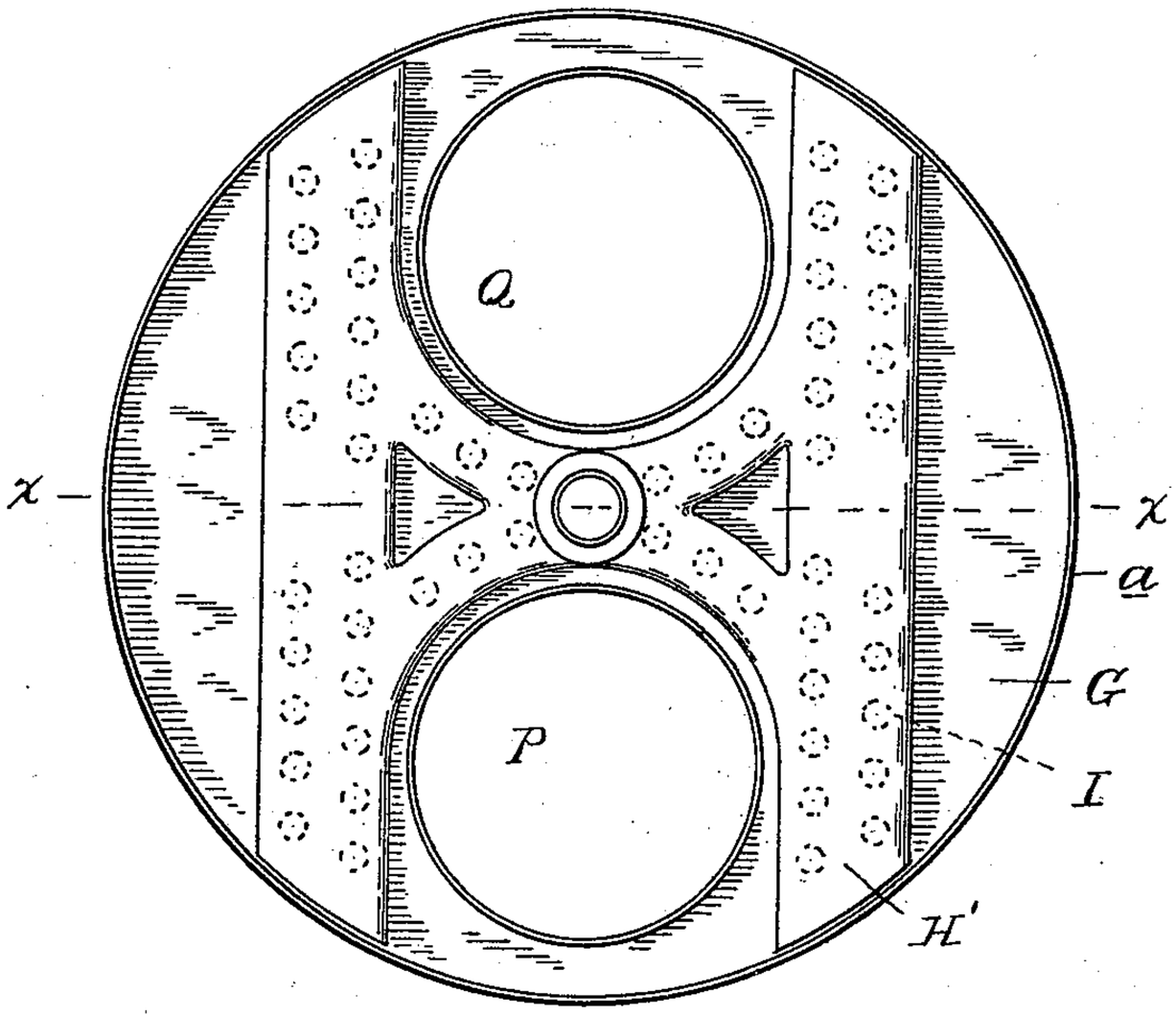
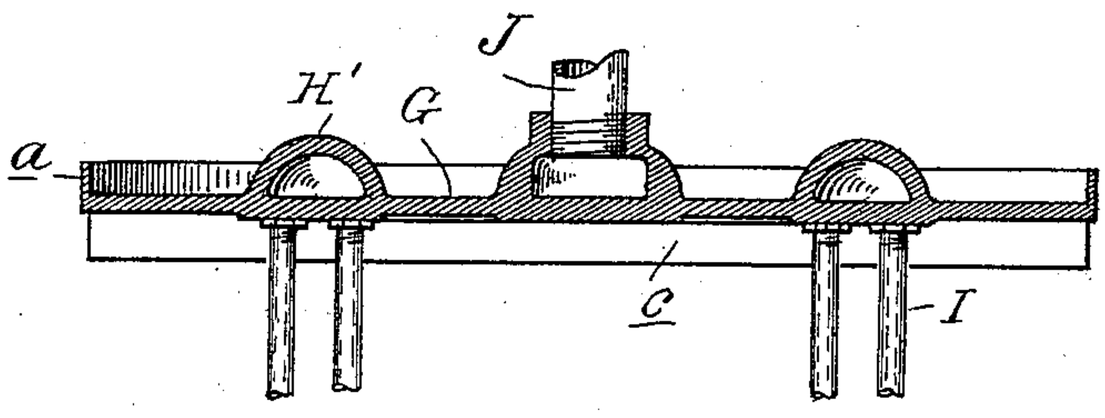


Fig. 4.



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UNITED STATES PATENT OFFICE.

DAVID E. AUSTIN, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO FRANK T. CAUGHEY, OF SAME PLACE.

HEATER.

SPECIFICATION forming part of Letters Patent No. 620,874, dated March 14, 1899.

Application filed April 4, 1898. Serial No. 676,348. (No model.)

To all whom it may concern:

Be it known that I, DAVID E. AUSTIN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Heaters, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of a supplemental heater adapted to be heated by the products of combustion from a furnace and comprising a chamber having therein a series of circulating-pipes connected into heads, from which heads extend a circulating system.

The invention further consists in the peculiar construction of the heater and in the construction, arrangement, and combination of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a diagrammatic section of part of a house, showing a furnace and my auxiliary heater applied thereto, with a circulating hot-water system connected therewith. Fig. 2 is a vertical central section through the heater. Fig. 3 is a top plan view of the upper head. Fig. 4 is a central cross-section on line *x x* of Fig. 3. Fig. 5 is a bottom plan view of the lower head.

In the present state of the art it is customary to use the products of combustion from furnaces or stoves through heating-drums of various constructions, the heating-drums being the ordinary hot-air drums which are usually located directly in the room to be heated. It has also been proposed to heat tanks of hot water for use in kitchens by means of water-tanks surrounding the kitchen stovepipe; but so far as I am aware no one has applied in a chamber connected with the smoke-pipe from a furnace an auxiliary heater comprising a series of water-circulating pipes in the chamber from which a water-heating circuit extends.

A represents a furnace of any desired construction having the smoke-pipe B, which leads to the usual chimney C, and D and E represent floors of the building above the furnace.

F is a casing, preferably of sheet metal and preferably cylindrical. This casing is provided at top and bottom with heads G and H. These heads are preferably cast heads provided with marginal flanges *a*, to which the casing may be bolted, riveted, or otherwise secured. The heads are provided with hollow chambers which are in the nature of headers and which I will therefore call "headers" H′. These headers are preferably cast integral with the head proper, as plainly shown in Fig. 4. The headers are connected by a series of circulating-tubes I. The upper header is provided centrally with an outgoing discharge-pipe J, and the lower header is provided with a return-pipe K. These pipes are connected, respectively, to the outgoing and the return pipes L and M of the hot-water circuit extending into the house and comprising a radiator or radiators N. The upper head is provided with a central transverse flange *c*, to which is connected the depending diaphragm or partition O, which extends nearly to the bottom of the casing and divides it into two chambers connected by the opening below the lower edge of the diaphragm O. The upper head has in it a smoke-inlet passage P and a smoke-exit passage Q on opposite sides of the diaphragm, and these passages are connected by means of the pipes R R′ with a smoke-pipe B from the furnace.

S is a damper located in the smoke-pipe between the pipes R R′, so that in case a direct passage is desired the damper may be turned and allow the products of combustion to pass into the chimney without passing through the casing F; but in case the supplemental heater is used the damper is turned across the pipe, as shown in Fig. 2, in which case the products of combustion will pass down into the casing to near the bottom thereof on one side of the diaphragm O and then up to the top upon the other side thereof, finding exit through the aperture Q and from thence into the smoke-pipe and the chimney.

It will be seen that the products of combustion will pass over the entire length of both sets of pipes on opposite sides of the diaphragm O, which pipes are small pipes giving a large surface to be heated.

It will also be observed that the products of combustion pass from the smoke-pipe into a large chamber within the casing, which de-

creases the speed of their flow somewhat at this point, and thereby holds them long enough to give off the greater part of their heat into the water circulation.

The water circulation will pass up from the outgoing pipe from the upper heater and return to the return-pipe in the lower heater in the usual manner of water-circulating systems.

I have found by actual tests that such a heater will take the greater part of the heat from the products of combustion, so that they will pass up the chimney only slightly slower, and the heat therefrom will be given off into the rooms above in which the radiators are located.

What I claim as my invention is—

1. The combination with a conductor for the products of combustion from a furnace or the like, of a damper therein, a supplemental heater comprising a casing connecting with said conductor on each side of said damper, headers for said casing, water-heating tubes connecting said headers, a partition in said casing between its connections with the conductor and a heating-circuit having its outgoing and return pipes connected respectively to said headers, substantially as described.

2. The combination with a conductor for products of combustion from a furnace or the like, of two pipes connected with said conductor, a casting provided with a header and secured to said pipes, a similar casting also provided with a header, water-heating tubes connecting said headers, a sheet-metal piece connected to said castings and forming therewith a casing inclosing said water-heating pipes, a partition in said casing between said two pipes and a circulating system connecting with said headers, substantially as and for the purpose set forth.

3. The combination of a casting provided with two flanged openings, a circumferential flange and a header, a similar casting provided with a header and a circumferential flange, a sheet-metal tube secured to said circumferential flanges connecting said casting and forming therewith a casing, water-heating tubes connecting said headers, a partition secured to said first casting and extending into said casing, two pipes secured to the flanges around said openings in the first casting, and a circulating system connecting with said headers, substantially as and for the purpose set forth.

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

DAVID E. AUSTIN.

Witnesses:

M. B. O'DOGHERTY,

OTTO F. BARTHEL.