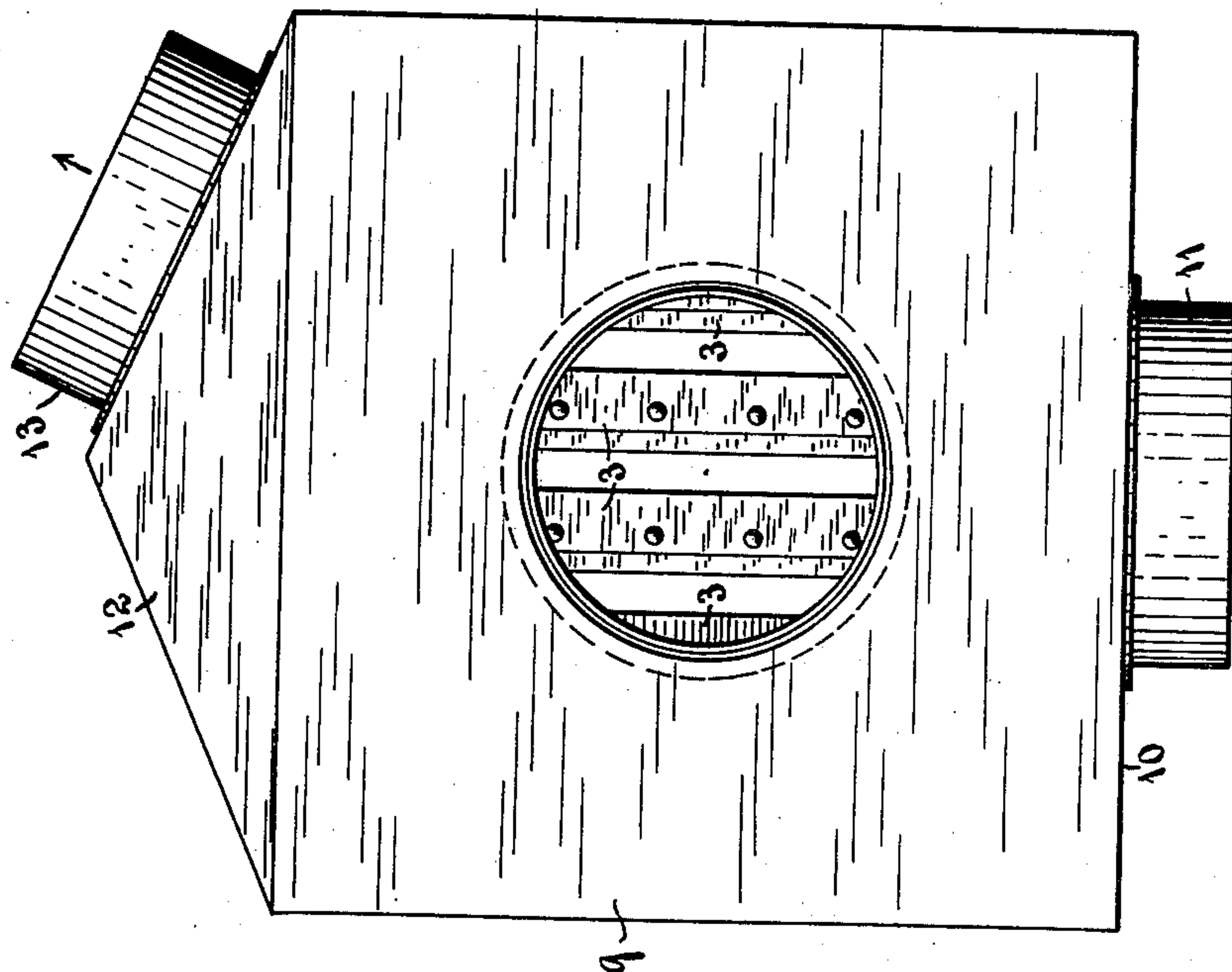
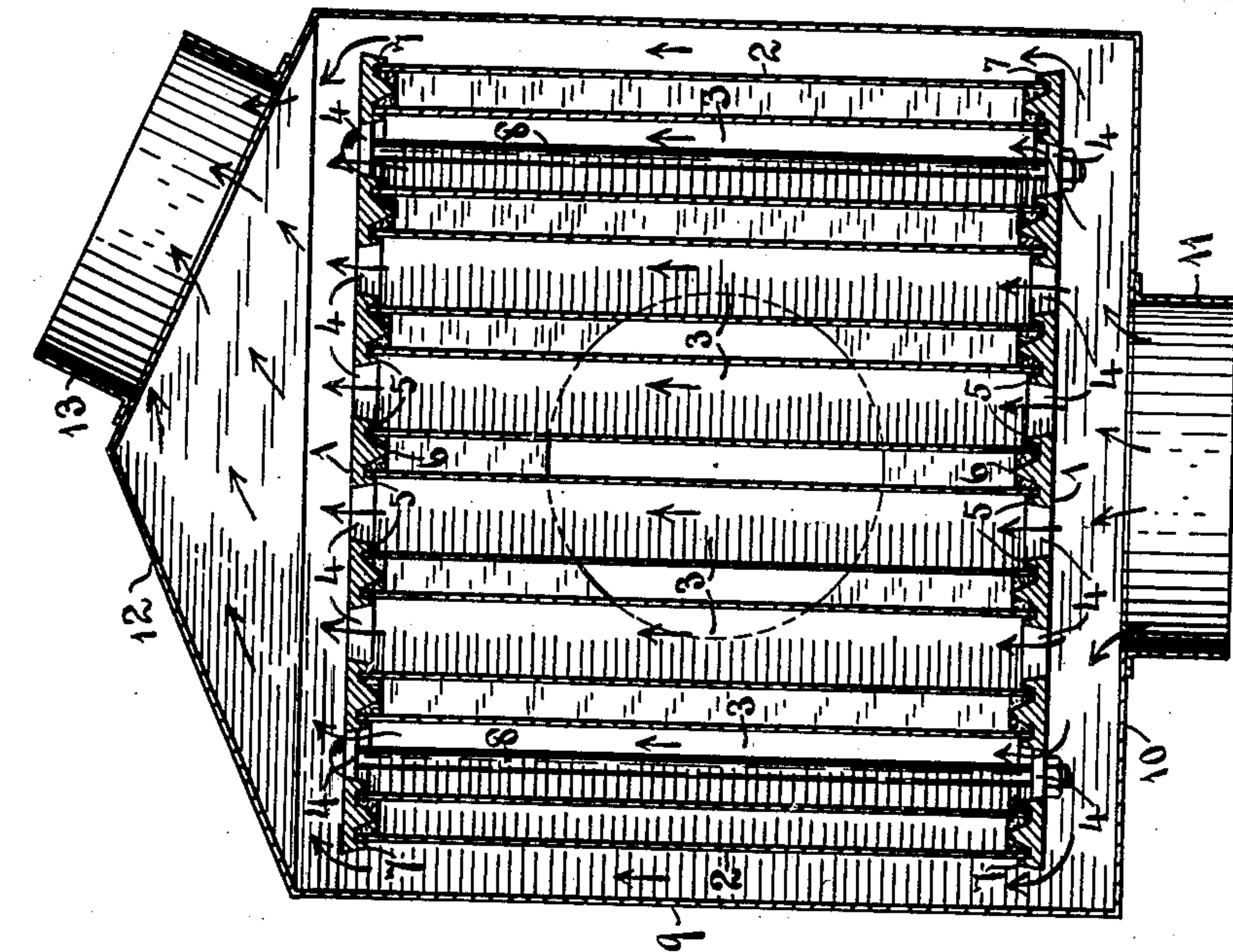


908,200.

G. R. BROWN.  
SMOKE PIPE RADIATOR.  
APPLICATION FILED JUNE 26, 1908.

Patented Dec. 29, 1908.

3 SHEETS—SHEET 1.



WITNESSES:  
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3 SHEETS—SHEET 2.

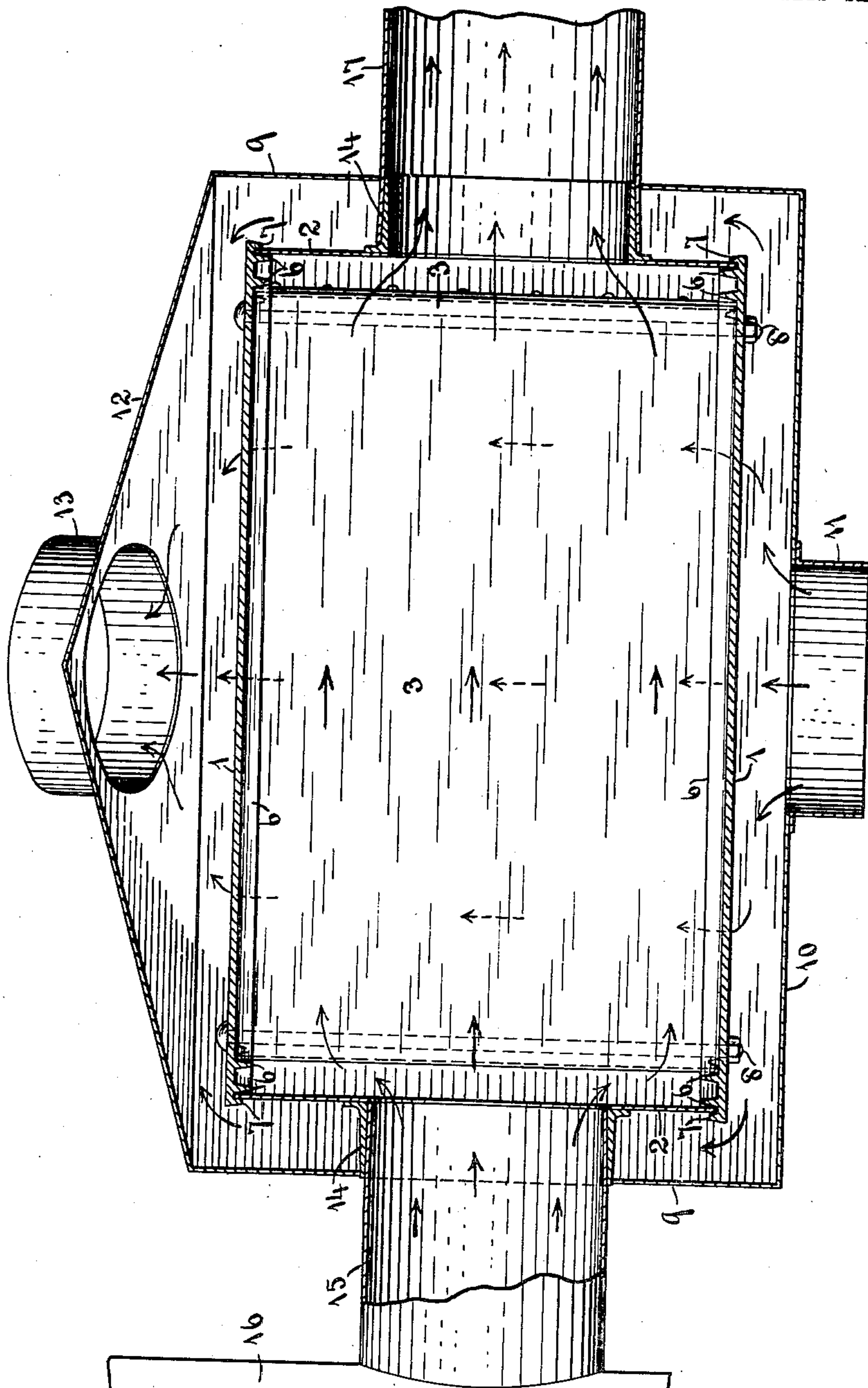


Fig. 3.

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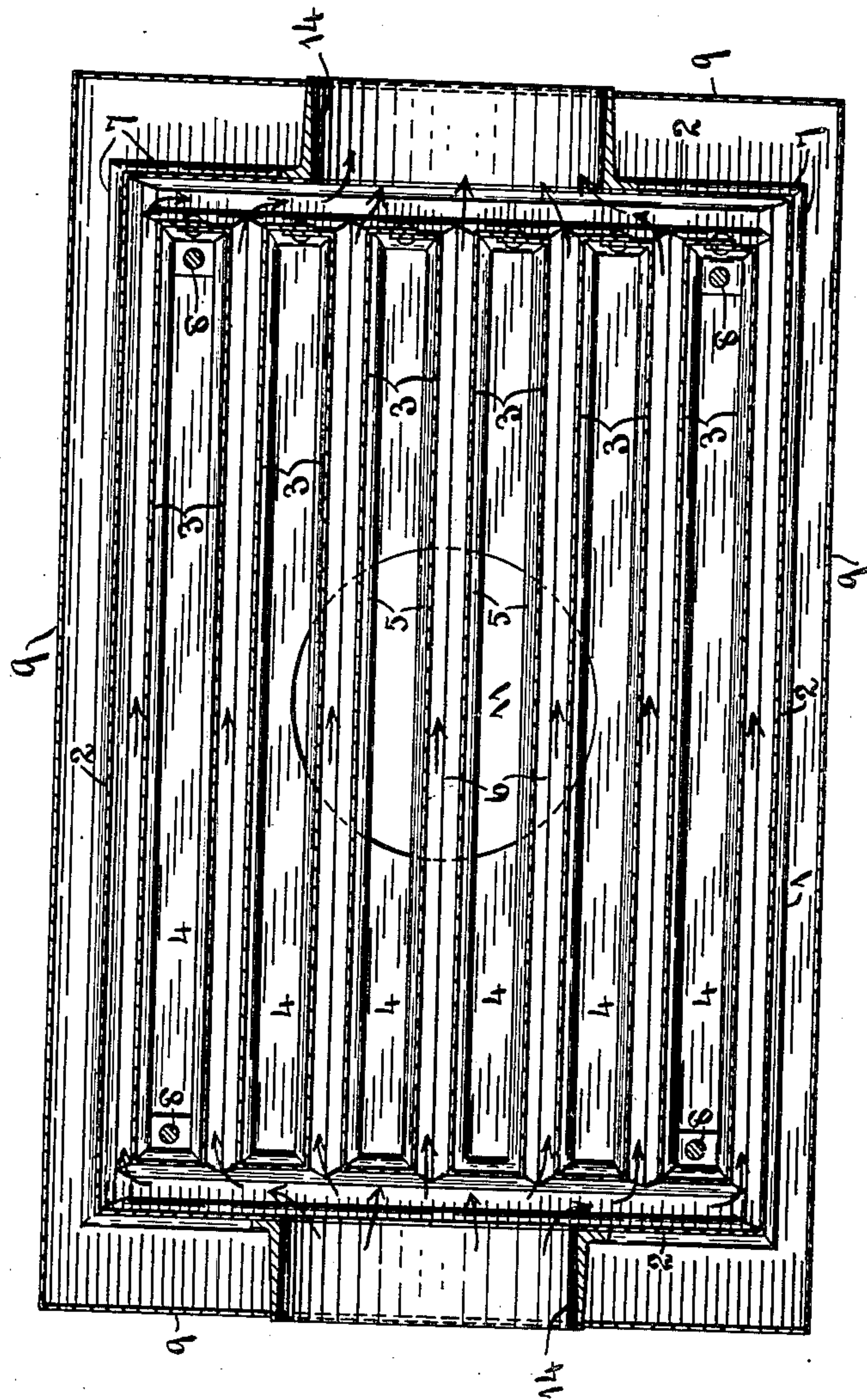


Fig. 4.

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# UNITED STATES PATENT OFFICE.

GEORGE R. BROWN, OF ELMIRA, NEW YORK.

## SMOKE-PIPE RADIATOR.

No. 908,200.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed June 26, 1908. Serial No. 440,492.

*To all whom it may concern:*

Be it known that I, GEORGE R. BROWN, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented a new and useful Smoke-Pipe Radiator, of which the following is a specification.

This invention relates to improvements in devices for utilizing the heat which passes off through the smoke pipe of a heater, or furnace for dwelling houses or other buildings; my object being to provide a compact and efficient radiator of small cost, which may be readily coupled into the smoke pipe connection between a heater and the chimney, and whereby a certain percentage of the heat of the waste gases passing through the smoke pipe may be utilized to augment the heater in warming one or more rooms of a building, without, however, extracting so much of the heat as to destroy the draft.

It frequently occurs that some particular room of a building is found to be not satisfactorily heated from a heater after installation, either by reason of its location with respect to the heater, or to the inability of the heater connections to supply the necessary circulation to all parts of the building under different atmospheric conditions. By placing a properly constructed radiator in the smoke pipe, and conducting an air current directly through the radiator to the room, or rooms, which it is desired to heat, this difficulty may be overcome, and, in addition thereto, a more economical heating apparatus may be produced, inasmuch as a large percentage of the heat which would otherwise be wasted can be utilized in producing a direct hot air current to any desired point, independent of the other heater connections.

I attain my object by constructing the radiator in the manner illustrated in the accompanying drawings, in which—

Figure 1 represents an end elevation of the radiator, as viewed through one of the smoke pipe connections; Fig. 2, a vertical transverse section thereof; and Figs. 3 and 4, vertical and horizontal longitudinal sections, respectively.

Like numerals designate like parts in the several views.

The radiator consists of an oblong metal box composed of cast and sheet iron parts, and having narrow vertical and longitudinal

passages or flues passing through it in the manner presently to be described, whereby the furnace gases will pass through in close contiguity with fresh air currents, which are conducted through and around the radiator within a suitable envelop or casing provided with suitable inlet and outlet connections.

The radiator box consists of two cast iron plates 1, spaced apart a suitable distance, the spaces between the castings being inclosed by a sheet metal casing 2, preferably of black iron. Within the box so formed there are a plurality of vertical flues 3, consisting of black sheet metal tubes of oblong rectangular shape, into which corresponding openings 4 open through the castings 1. To insure gas tight joints where the outside casing and flue casings unite with the castings, I provide on the castings suitable grooves around the edges thereof and around the openings 4, said grooves being formed by the beveled ridges 5 formed immediately adjacent the openings, and by deeper ridges 6 between and at the ends of the openings and inside the outer edges of the castings, a continuous ridge 7, corresponding with the ridges 5, being provided around said outer edges. These ridges form V-shaped grooves, into which the ends of the flues 3, and the outer casing 2, may be readily entered in assembling the box; the ridges 5 and 7 being made lower than the ridges 6, in order to facilitate the entry of the flues and casing into the grooves. These grooves are filled with cement on both sides of the sheet metal of the flues and casing, which, when hardened, will form smoke and gas tight joints. The castings 1 are drawn into tight engagement with the flues and casing by means of four or more bolts 8, which preferably pass through flues adjacent the corners of the radiator box. Surrounding this radiator box, and spaced away from it on all sides, is a sheet metal box 9, preferably of galvanized iron, having a flat bottom 10 provided at the center with a coupling 11, by which it may be united to a pipe connection from any suitable source of fresh air supply. The top of the casing 9 is preferably of pyramidal shape, and is provided with one or more connections 13, by which it is connected with the line, or lines of pipe leading to the point, or points to which it is desired to conduct the heat from the radiator. The radiator



casing 2 is provided at each end with cast iron connections 14, into which, at one end of the radiator, the smoke pipe 15 is entered directly from the heater, indicated at 16; the connection 14 at the other end of the radiator being inserted in the smoke pipe 17, which leads on to the chimney. The outside box 9 is provided at each end with openings through which the connections 14 project, said openings being fitted around the connection 14 on the heater side, and around the smoke pipe on the chimney side.

As so constructed, the gases from the firepot, after passing through the heater, are carried into the radiator, and there divided up, passing through the narrow longitudinal passages running between the vertical flues 3 and between the casing 2 and the outer of said flues, the ends of the flues being set in from the ends of the casing 2 a suitable distance to provide the necessary interconnecting passageways. The air current entering the outer box through the connection 11 is split up, passing upward through the flues 3 and through the spaces between the sides and ends of the radiator casing 2 and the outer box 9. After becoming heated from contact with the sheet metal flues, the air currents are brought together in the top, or dome of the outside box, passing thence through the connection 13 to the hot air pipe. It will, of course, be understood that the flue areas and the over all dimensions of the radiator will be proportioned in accordance with the size of the particular heater to which the radiator is to be attached, in order that no more than a desirable percentage of the heat shall be taken from the waste gases, it being apparent that if the radiator were of too large proportions heat would be extracted to such an extent as to completely destroy the draft to the chimney. By reason of the narrow gas and fresh air flues running transversely to each other, respectively, and separated by thin sheet metal walls, a high degree of efficiency is attained with a comparatively small radiator. In the spaces between the radiator box and the outside box the air currents will be more sluggish than

toward the center, forming in effect an insulating jacket for the radiator box.

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

1. A smoke pipe radiator comprising an inside radiator box of rectangular form provided at opposite ends with smoke pipe connections, a plurality of oblong sheet metal flues passing through the radiator box at right angles to the smoke pipe connections, said flues forming air passages through the radiator box with narrow gas passages between, and an outside air box inclosing a radiator box and provided with inlet and outlet connections communicating respectively with the opposite ends of said flues.

2. A smoke pipe radiator comprising an inside radiator box composed of a pair of grid shaped plates spaced apart with a sheet metal casing and sheet metal flues fastened therebetween with gas tight joints, said flues uniting oppositely disposed grid openings in the two plates to form air passages through the radiator box, smoke pipe connections at opposite ends of the casing, and an outside air box inclosing the radiator box, said air box being provided with an air inlet and an air outlet and with openings in register with the smoke pipe connections.

3. A radiator box comprising a pair of grid shaped plates spaced apart and provided on oppositely disposed sides with grooves around their respective edges and openings, a sheet metal casing and a plurality of sheet metal flues having their opposite ends fitted into said grooves, said flues uniting oppositely disposed grid openings in the two plates to form air passages through the radiator box, means for fastening the plates against the ends of said casings and flues, and pipe connections leading out from the ends of the casing.

In testimony whereof I have affixed my signature, in presence of two witnesses.

GEORGE R. BROWN.

Witnesses:

M. E. VERBECK,  
A. S. DIVEN.