

P. SCHILL.

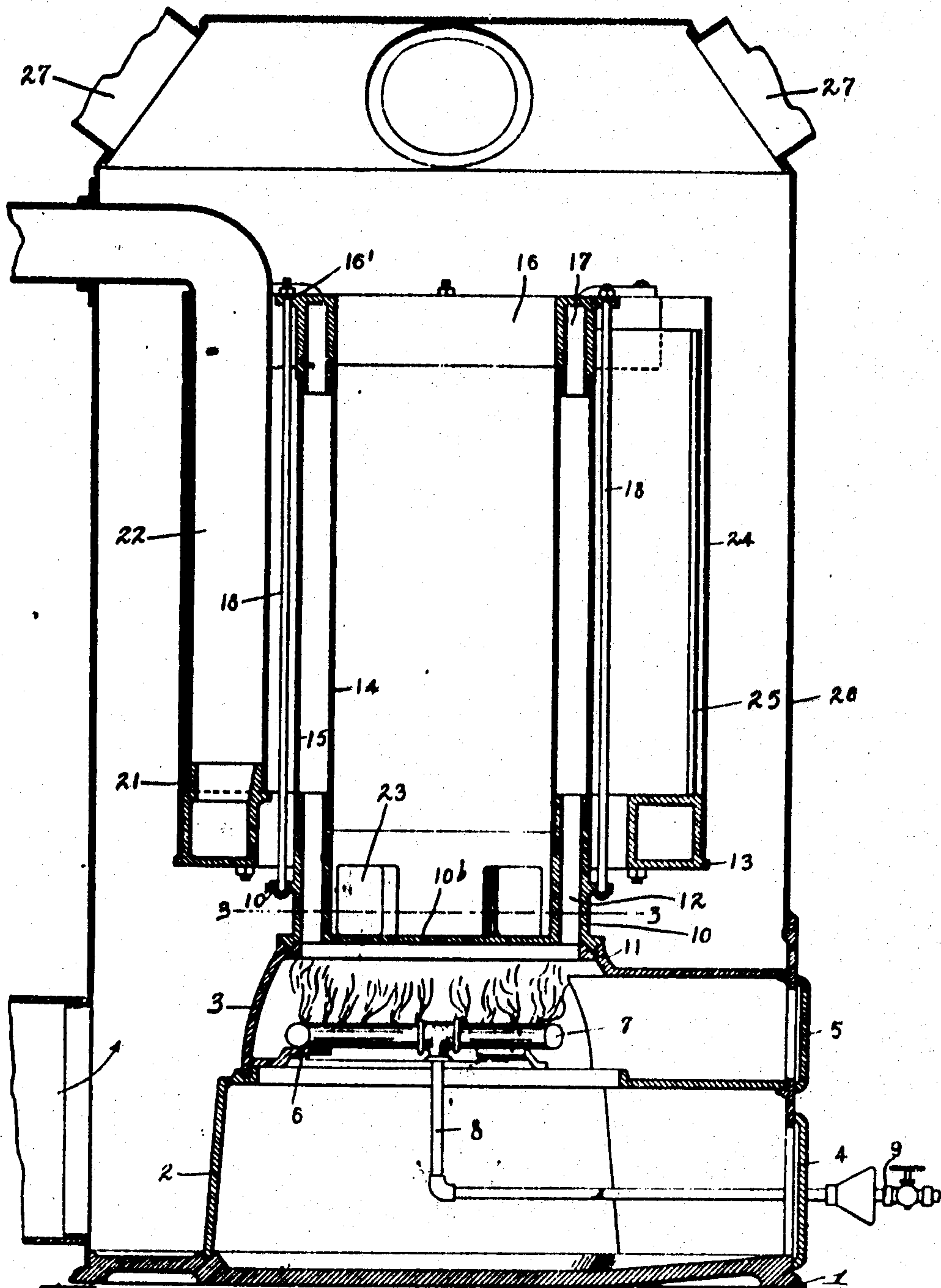
HEATER.

APPLICATION FILED SEPT. 16, 1908.

932,500.

Patented Aug. 31, 1909.

2 SHEETS—SHEET 1.



Witnesses:
Nathan T. Fetter
Arthur S. Remberg.

Fig. 1

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2 SHEETS—SHEET 2.

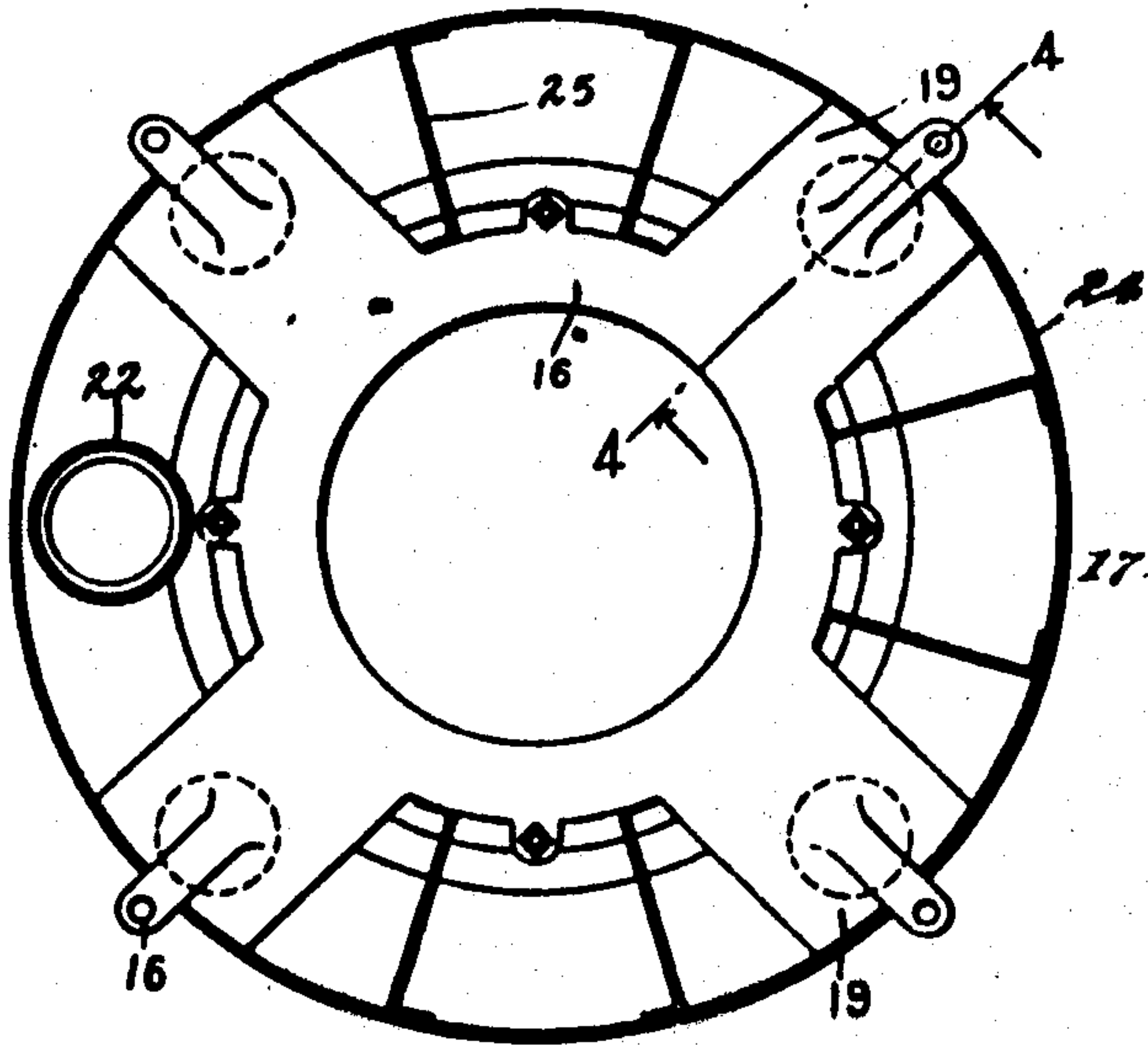


Fig. 2

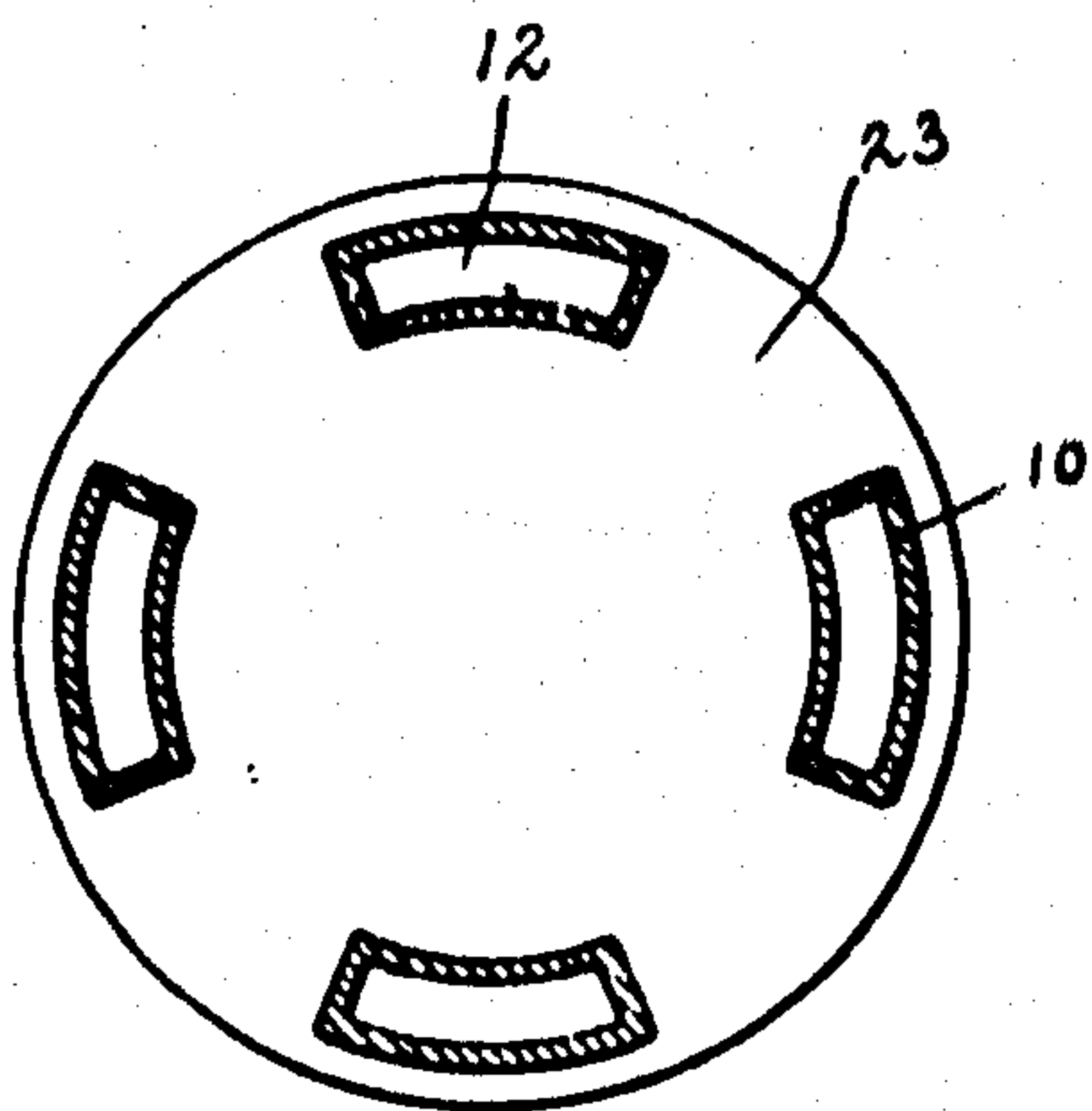


Fig. 3

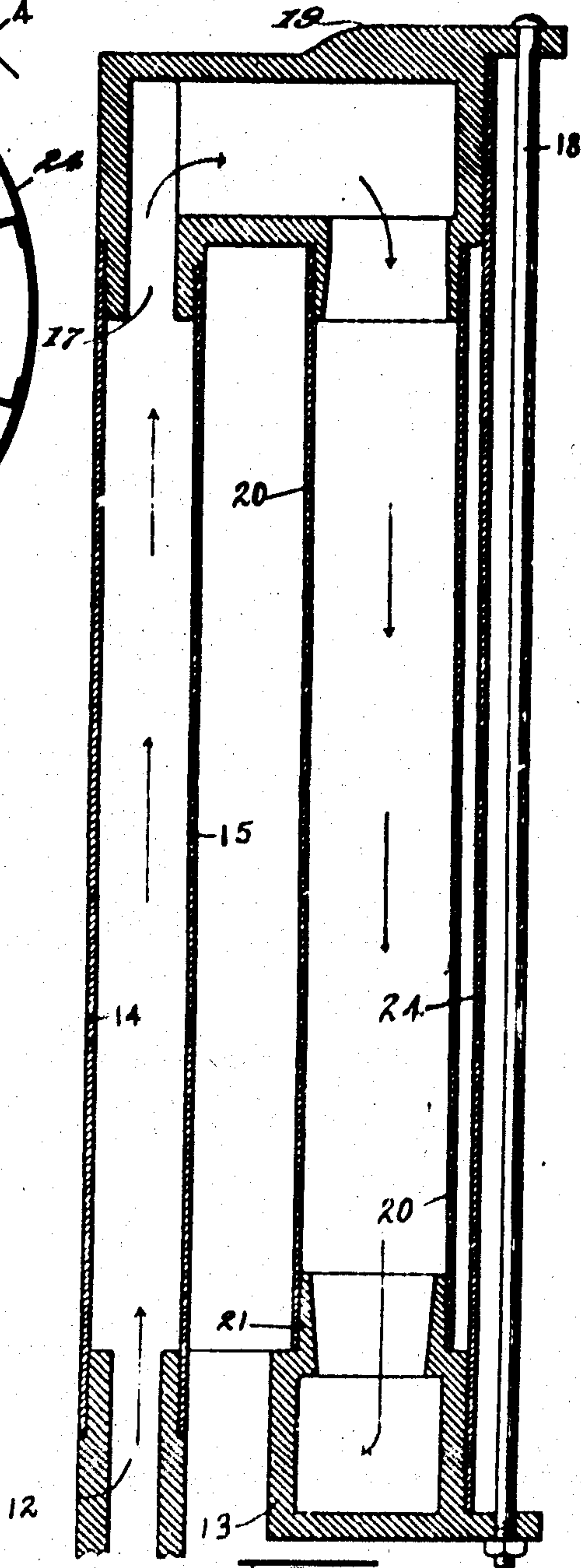


Fig. 4

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UNITED STATES PATENT OFFICE.

PETER SCHILL, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO WILLIAM A. REHBURG, OF CLEVELAND, OHIO.

HEATER.

932,500.

Specification of Letters Patent.

Patented Aug. 31, 1909.

Application filed September 16, 1903. Serial No. 453,340.

To all whom it may concern:

Be it known that I, PETER SCHILL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Heaters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to heaters, more particularly to gas heaters, and provides a heating device in which the products of combustion from the burner are caused to travel in a sinuous course while the air to be heated is brought into intimate contact with the conduits which carry the air. Moreover, by the construction which I have provided, a column of fresh, cool air ascends through a central duct of the heater, which cool air is surrounded by the flue member that carries the products of combustion from the burner. Likewise, a second, hollow column of fresh, cool air ascends through the heater upon the outside of the flue member. Thus the flue member is enveloped, as it were, with the cool air upon all sides, which results that practically all the heat in the products of combustion is extracted therefrom and absorbed by the air passing through the heating device, which air is to be delivered to the room or rooms to be heated.

Generally speaking, the invention comprises the elements and combinations thereof set forth in the accompanying claims.

Reference should be had to the accompanying drawings forming a part of this specification, in which—

Figure 1 is a central vertical section through the heater and inclosing casing; Fig. 2 is a top plan view of the heating device; Fig. 3 is a section taken upon the line 3--3 of Fig. 1; and Fig. 4 is a vertical section upon the line 4--4 of Fig. 2 taken in the direction of the arrows.

Generally speaking, the invention comprises a burner, and heating device through which air is caused to pass and absorb heat from the products of combustion from the burner. The said device and burner are surrounded by a casing which is in communication with suitable pipes for conducting the heated air to the place or places that may be desired. Upon the base 1 is mounted a casting 2 which is also surmounted by a casting 3. Both of the castings are hollow and are

provided with openings 4 and 5 at the front end of the same. The bottom part of the member 3 has an opening which is provided with inwardly projecting lugs 6 that are adapted to support a burner 7. This burner may be of any desired type. Gas or other fluid fuel is supplied by means of a pipe 8 to the said burner. This pipe 8 enters the furnace through the opening 4 and outside is in communication with a valved pipe 9 which communicates with the source of fuel. The opening 5 is closed by a door which may readily be removed so as to permit access to the combustion chamber formed within the member 3.

Mounted upon the casting 3 is a member 10 round in shape which is formed of cast metal. The member 10 has a tongue and groove connection, as indicated at 11, with the member 3, so as to be readily removed from the same when it is desired to disassociate the parts for the purpose of cleaning or repair. The member 10 is formed as a hollow casting with two parallel side walls. A plurality of openings 23 extend through the side walls, which openings are bounded by walls so as to have no communication with the space 12 between the side walls. The space 12 is uninclosed at the top of the member and is also uninclosed at the bottom of those portions between the openings 23. A bottom 10^b connects with the inside wall of the member 10 and is preferably formed integral therewith.

A hollow circular member 13 of cast metal surrounds the member 10 and is secured thereto. The members 10 and 13 may be separately formed and secured together, or, if desired, they may be formed as a single casting. The upper part of the walls of the member 10 are rabbeted to accommodate the lower ends of telescoping tubular members 14 and 15. The said tubular members are of sheet metal and are held in place with respect to the member 10 by frictional engagement with the side walls and lower part of the rabbeted portions as before mentioned. At the upper end of these tubular members is a member 16 which is of cast metal. The said member 16 is formed with parallel side walls which provide a hollow space 17 therebetween, which is closed at the top and open at the bottom. The end portions of these walls are rabbeted in a manner similar to the walls of the member 10 and the upper ends

of the tubular members 14 and 15 are adapted to engage with the side and bottom of the rabbeted portions of the member 16.

The members 10, 14, 15 and 16 are held together by means of brace rods 18 which are formed with heads at one end and screw-threaded portions at their opposite ends which are adapted to engage with nuts. These rods extend through openings formed in flanges 16' and 10' which are formed upon the members 16 and 10, with which flanges the bolt heads and nuts engage. There are a number of these rods extending around the members 10 and 16, so that the members are securely held in relative position.

In plan, the member 16 is shown in Fig. 2 and it is seen that the said member is formed with a series of projecting portions 19 which are hollow and the interiors of which are in communication with the space 17. These projections are formed as integral parts of the outer wall of the member 16. The lower portions of the members 19 are formed with openings which communicate with pipes 20, which pipes likewise communicate with the interior of the members 13, as shown in Fig. 4. One portion of the member 13 is formed with a flanged opening 21 which is in communication with a flue pipe 22, which pipe leads to the chimney for conducting away products of combustion.

As before stated, the member 10 is formed with a series of openings 23 which openings extend through the walls inclosing the space 12. These openings are for the purpose of admitting air into the space inclosed by the inner wall of the member 10 and the member 14.

A sheet metal shield 24 surrounds and incloses the hollow members, pipes, etc. It is supported upon a flange which projects outwardly from the hollow member 13 and extends to a height substantially equal with the top of the heating device. Sheet metal members 25 formed in a Z-shape with the middle part greatly lengthened are secured as by riveting to the outer tubular member 15, the outer edges of these members bear against the inner side of the shield 24. The said members are of the same height as the shield. By virtue of the fact that these members 25 are secured to the member 15 they become highly heated by the radiated heat and the air in passing around them absorbs considerable heat from them. They also serve as stiffening members to brace the outer shield.

A casing 26 is mounted upon the base member 1 and incloses the members 2 and 3 and the heating device which is mounted upon the member 3. The front part of this casing is cut away so as to accommodate the front portions of the members 2 and 3. At the upper end of the casing are pipes 27

which will conduct the heated air to the places that may be desired.

It will be noted that the products of combustion from the burner are caused to first travel through the space 12 which is comprehended between the walls of the member 10 and between the tubular members 14 and 15. They will then enter the space 17 in the member 16 and passing out through the hollow projections 19 formed upon the member 16 will pass down through the pipes 20 and enter the interior of the member 13. Circulating around this member, they will next pass through the flue pipe 22 and enter the chimney, from whence they will pass to the atmosphere. The cool air upon entering will pass through the openings 23 in the member 10 and up through the central air shaft which is inclosed by the tubular member 14. Additional air will likewise circulate around the exterior of the tubular member 15 and also around the tubular member 20, as well as around the flue pipe 22. All the air entering the casing after being heated will pass to the upper portion of the casing 26, where it will be conducted through the pipes 27.

Particular importance is attached to the fact that a column of air is caused to ascend through the central portion of the heater. In the ordinary types of heater the burner is placed in a position similar to the manner which I have shown and a central tubular member is arranged above the burner to carry away the products of combustion. In such a construction only a small portion of the heat contained within the products of combustion is radiated to the air surrounding the same, the most of it passing up the flue. In my construction, the products of combustion pass through the conduits, which are comparatively small in cross-sectional area, so that they are spread out, as it were, affording a large surface for contact with the air which it is desired to heat.

By sending the air through the sinuous course which it is caused to assume, sufficient time is given the air passing through the casing to extract all the heat units which are contained within the products of combustion, and so to obtain the highest efficiency from the device, which of course cheapens its operation.

The whole heater is simple in construction and may readily be disassembled for purposes of repair and cleaning.

I claim:

1. In a device of the character described, a burner, a double walled hollow member above said burner, telescoping hollow members adapted to cooperate with the walls upon said member, a hollow cap member formed with two walls there being a walled opening through the central part of said cap forming a continuation of the space within the inner

of the telescoping members, each wall cooperating with one of the tubular members just mentioned, a hollow member encircling the hollow members before mentioned, the cap member having hollow projections extending from it, and pipes connecting the interior of the said projections with the interior of the encircling hollow member, and a flue pipe in communication with the encircling hollow member.

2. In a device of the character described, a burner, a double walled hollow member above said burner, telescoping hollow members adapted to cooperate with the walls upon the first-mentioned member, a hollow cap member formed with two walls, each wall cooperating with one of the tubular members just mentioned, a hollow member encircling the tubular members above mentioned, and a protecting shield member supported from the last-mentioned hollow member and encircling all the members above set forth, substantially as described.

3. A heater comprising a double walled drum, a hollow base and cap member for said drum, the base member being closed at the bottom, the cap member having hollow arms projecting from it and having an annular channel coincident with the inner walls of the drum, a hollow annular member supported from the cap, pipes connecting the hollow arms and the hollow annular member, a flue pipe connected to the hollow annular member, and a burner beneath the base of the drum.

4. A heater comprising a double walled drum, a hollow base for said drum having projecting lugs and being closed at the bottom, a cap member for said drum having an annular channel coincident with the inner

walls of the drum and lugs projecting from it, brace rods cooperating with the lugs on the base and cap to hold the structure together, said cap member having hollow arms with lugs thereon projecting from it, a hollow annular member surrounding the said drum near the lower part thereof and having lugs thereon, brace rods cooperating with the said lugs to support the hollow annular member, pipes connecting the hollow arms and the hollow annular member, a flue pipe connected to the hollow annular member, and a burner beneath the base of the drum.

5. In a device of the character described, a burner, a double walled hollow member above said burner, the space inclosed by the inner wall being closed at the bottom, whereby the products of combustion will pass between the walls of the said member, the said member being provided with walled openings through the side thereof for admitting air to the space within the inner wall, a hollow cap member formed with two walls, telescoping tubular members cooperating with the walls upon the first mentioned member and the cap member, a hollow member encircling the member above mentioned, said cap member being provided with hollow projections, and pipes connecting the interior of said projections with the interior of the encircling hollow member, and a flue pipe in communication with the encircling hollow member.

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

PETER SCHILL.

Witnesses:

W. A. REHBURG,
A. J. HUDSON.