

No. 760,327.

PATENTED MAY 17, 1904.

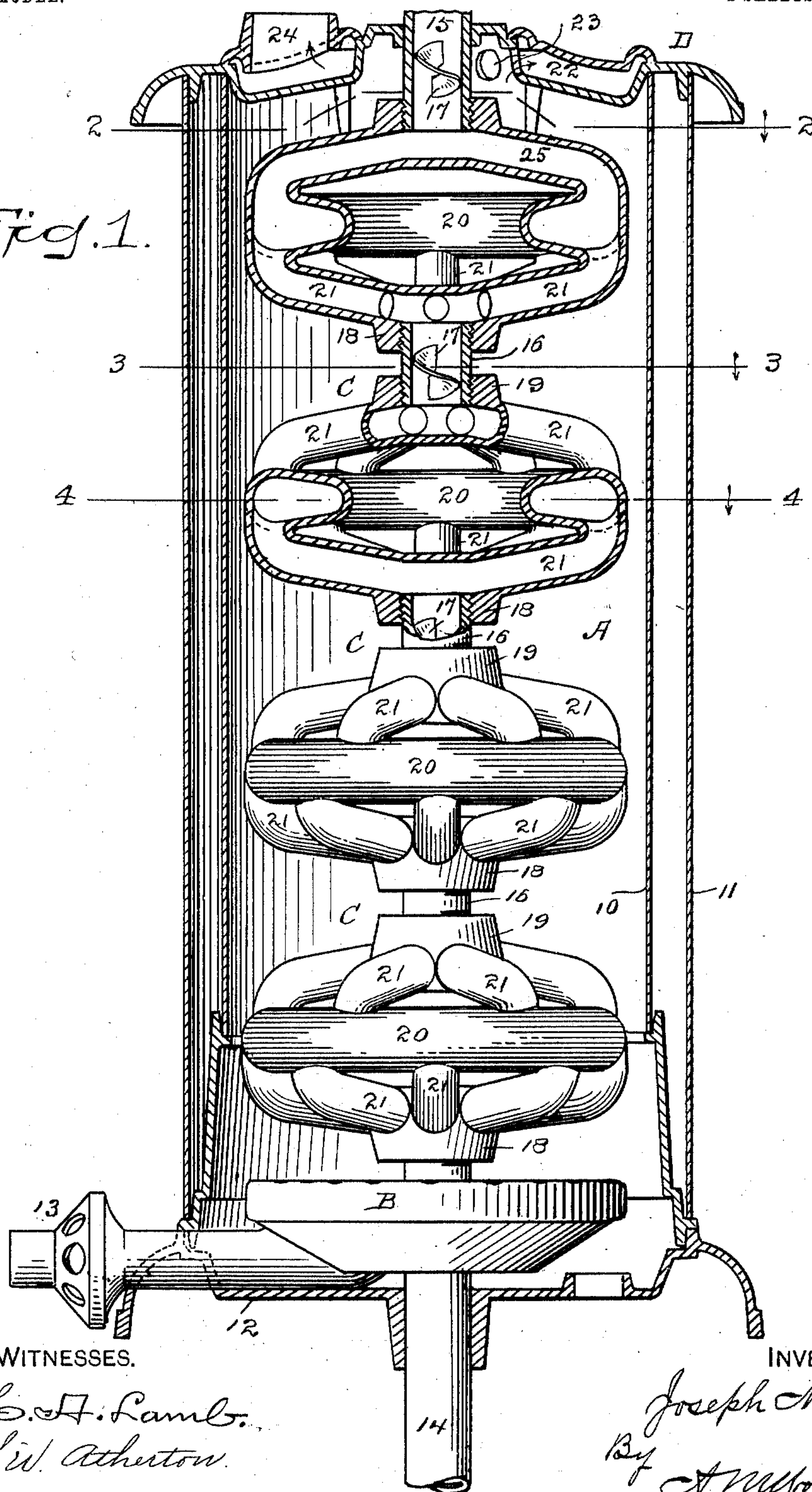
J. M. FOX.
WATER HEATER.

APPLICATION FILED AUG. 10, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES.

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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.

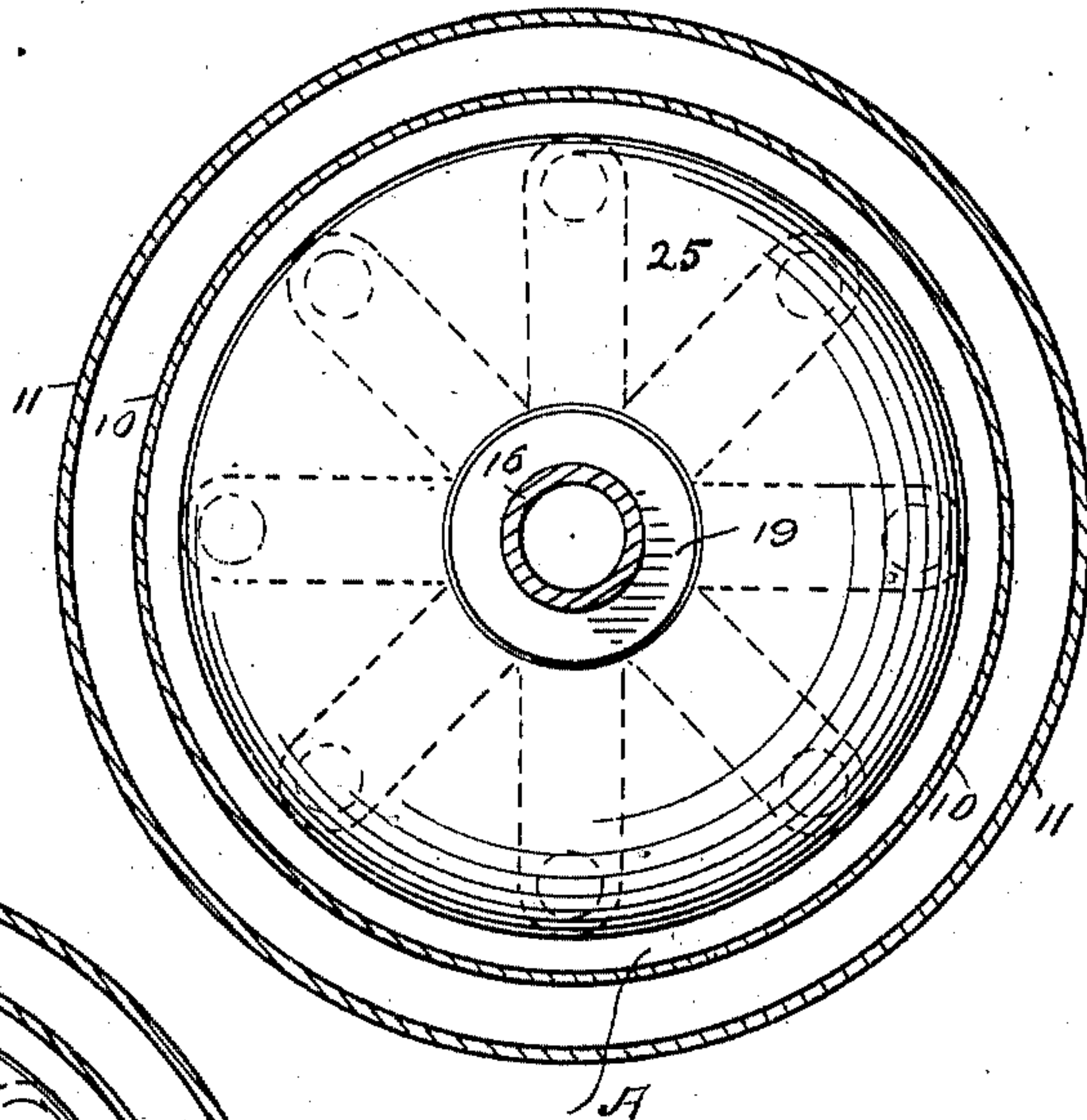


Fig. 3.

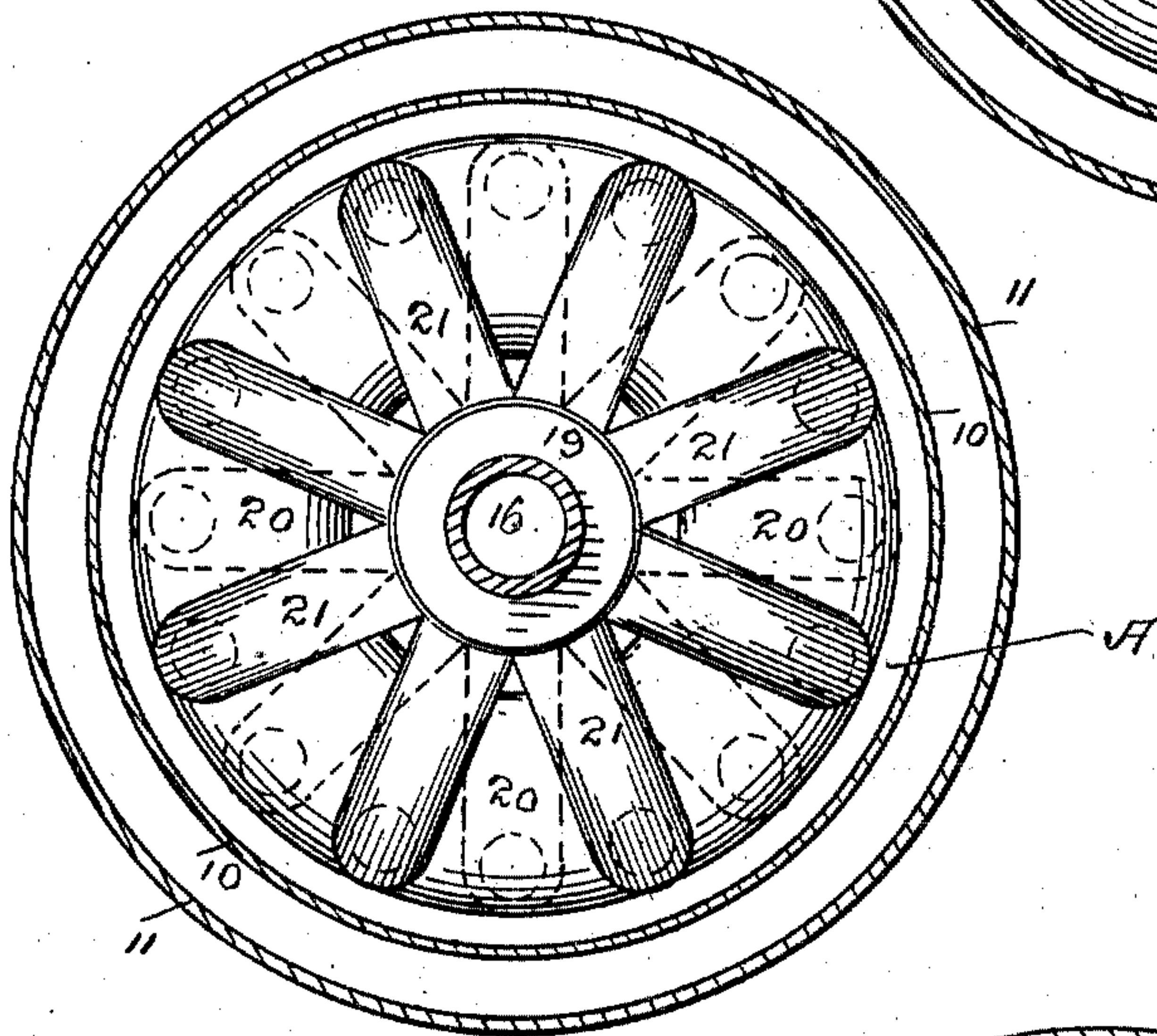
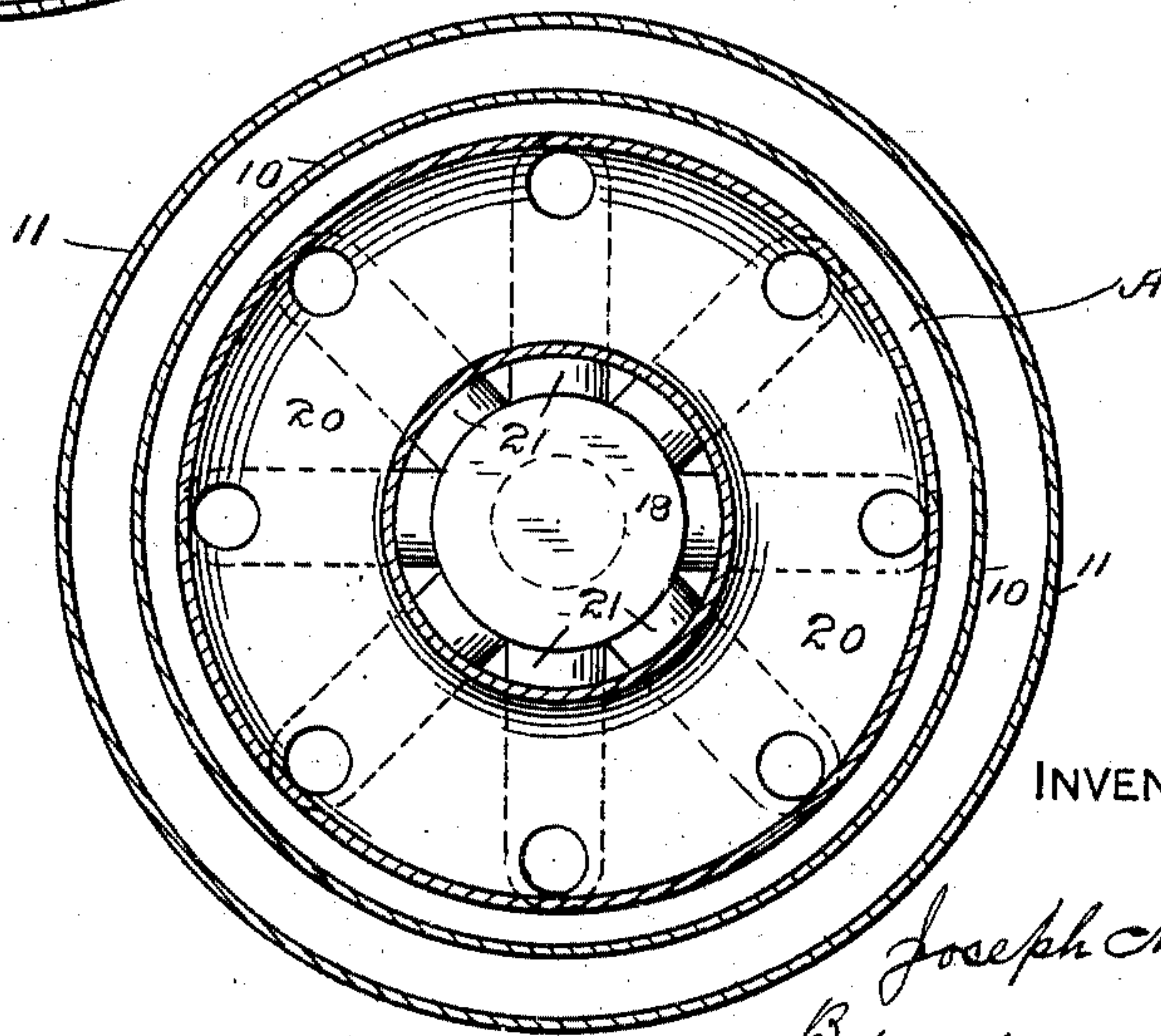


Fig. 4.



WITNESSES.

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UNITED STATES PATENT OFFICE.

JOSEPH M. FOX, OF PEEKSKILL, NEW YORK.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 760,327, dated May 17, 1904.

Application filed August 10, 1903. Serial No. 168,987. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. FOX, a citizen of the United States, residing at Peekskill, county of Westchester, State of New York, have invented a new and useful Water-Heater, of which the following is a specification.

My invention relates to the class of water-heaters in which the water is heated by being passed through a series of sections inclosed in a heating-chamber, it being wholly immaterial so far as my present invention is concerned to what use the heater is applied, whether for water-heating generally or for making steam, or what fuel or type of burner is used; and my invention has for its general object to simplify and cheapen the construction, to improve the operation in use, and to greatly reduce the consumption of fuel required to produce a required result, important special objects being to produce a novel form of section that will give a maximum amount of heating-surface and at the same time be relatively easy to cast and to produce a novel form of top plate that will retard the draft and prevent excessive radiation of heat from the top of the chamber.

With these and other objects in view my invention consists in certain constructions and in certain parts, improvements, and combinations, which will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings, forming a part of this specification, Figure 1 is a vertical sectional view, partly in elevation, illustrating the construction and mode of operation of my novel heater; Fig. 2, a section on the line 2 2 looking down; Fig. 3, a section on the line 3 3 looking down, and Fig. 4 is a section on the line 4 4 looking down.

The essential features of my novel water-heater are a heating-chamber, (indicated by A,) a heater proper, (indicated by B,) and a water-heating section or plurality of sections, (indicated by C.) The special construction of the heating-chamber is not of the essence of the invention. I have shown a heating-chamber having inner and outer walls, (indicated by 10 and 11, respectively,) a bottom plate, (indicated by 12,) and a top plate, which is

preferably but not necessarily of special construction and which I have indicated by D. The heater B illustrated in the drawings is an ordinary gas-heater having a gas and air supply pipe 13, although, as already stated, the special form of heater used is not of the essence of the invention.

14 denotes the water-supply pipe, and 15 the delivery-pipe. Between these pipes I place one or a plurality of my novel water-heating sections, connected, when a plurality is used, by short pipes 16.

17 denotes spiral plates which I preferably place in the water-pipes for the purpose of giving a whirl to the water as it enters and leaves the sections, so as to break up the column of water as it passes through the sections, thereby insuring that the entire body of water passing through the heater will be brought into direct contact with heating-surfaces.

Each heating-section comprises lower and upper hubs, (indicated, respectively, by 18 and 19,) an intermediate ring 20, which may be more or less oval in cross-section, as shown in the drawings, and inclined tubes 21, which connect the intermediate ring with the hubs. These inclined tubes are preferably staggered—that is, placed out of line with each other, as shown in the drawings, in which it will be seen that the lower inclined tubes intersect the ring midway between the intersection of the upper inclined tubes with the ring. This construction I find in practice produces better results in heating water to any required degree with a minimum consumption of fuel than any construction that has heretofore come to my knowledge, it being impossible for the water to pass through the sections in a column or columns, but inevitable that water columns be broken up in each section and practically the entire body of water brought into direct contact with heating-surfaces.

In practice where a plurality of water-heating sections are used I preferably use a special form of top section, as clearly shown in the drawings. (See Figs. 1 and 2.) The lower portion of this section is identical in construction with the other sections—that is to say, it

comprises an intermediate ring and a lower set of inclined tubes. The upper portion of the upper section, however, comprises a circular water-chamber, which I have indicated
 5 by 25, the water in this section being in a solid body, so that this section, in fact, serves as a baffle-plate and retards, as would any other form of baffle-plate, the passage of air from the heating-chamber. This special form
 10 of top section is provided with lower and upper hubs precisely like the other sections.

As already stated, the special form of top plate used is not of the essence of the invention. I preferably, however, use a top plate
 15 provided with an annular chamber 22, the function of which is to control the escape of heated air from the heating-chamber and prevent the escape of any air therefrom until it has made a partial circuit of the annular chamber.
 20 Another function of this chamber is to prevent radiation of heat from the top of the heating-chamber, as the radiation will be from the annular chamber instead of from the heating-chamber, thus assisting materially in
 25 keeping the air in the heating-chamber at a high temperature with a relatively small fuel consumption. All air escaping from the combustion-chamber must pass into one side of the annular chamber through openings 23, a
 30 plurality of said openings being provided on the side opposite to the outlet-pipe, which is indicated by 24, and thence around to the other side to escape through said outlet 24.

Having thus described my invention, I
 35 claim—

1. A heater-section comprising upper and lower hubs, an intermediate ring and a plurality of inclined tubes connecting the intermediate ring with the hubs.

40 2. A heater-section comprising hubs, a ring lying intermediate said hubs, said ring being oval in cross-section, and a plurality of inclined tubes connecting the intermediate ring with the hubs.

45 3. A heater-section comprising hubs, a ring lying intermediate said hubs and inclined tubes

connecting said ring with the hubs, said tubes being placed out of alinement with each other, substantially as shown, for the purpose specified.

50 4. In a heater of the character described the combination with water supply and delivery pipes, of a series of water-heating sections intermediate the supply and the delivery pipes, connecting-pipes intermediate the sections
 55 and spiral plates in the water-pipes, each of said sections presenting a deflecting-surface opposite the end of the pipe containing the spiral plate, whereby the water is spread spirally.

60 5. In a heater of the character described the combination with water supply and delivery pipes, of water-heating sections each consisting of hubs, a ring intermediate the hubs and staggered inclined pipes connecting the ring
 65 and the hubs.

6. In a heater of the character described the combination with water supply and delivery pipes, of water-heating sections each consisting of hubs, a ring intermediate the hubs and
 70 inclined pipes connecting the ring and the hubs, and water-pipes connecting the sections each of which is provided with a spiral plate.

7. In a heater of the character described the combination with water supply and delivery
 75 pipes and an intermediate water-heating section, of a heating-chamber comprising a bottom plate, inner and outer walls and a top plate having an annular chamber, openings into said chamber and an outlet-pipe opposite
 80 said openings.

8. An upper heater-section comprising hubs, a ring lying intermediate said hubs, a plurality of inclined tubes connecting the lower
 85 hub with the ring and a circular water-chamber intermediate the ring and the upper hub.

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

JOSEPH M. FOX.

Witnesses:

HARRY G. WATERBURY,
 WM. F. WATERBURY.