

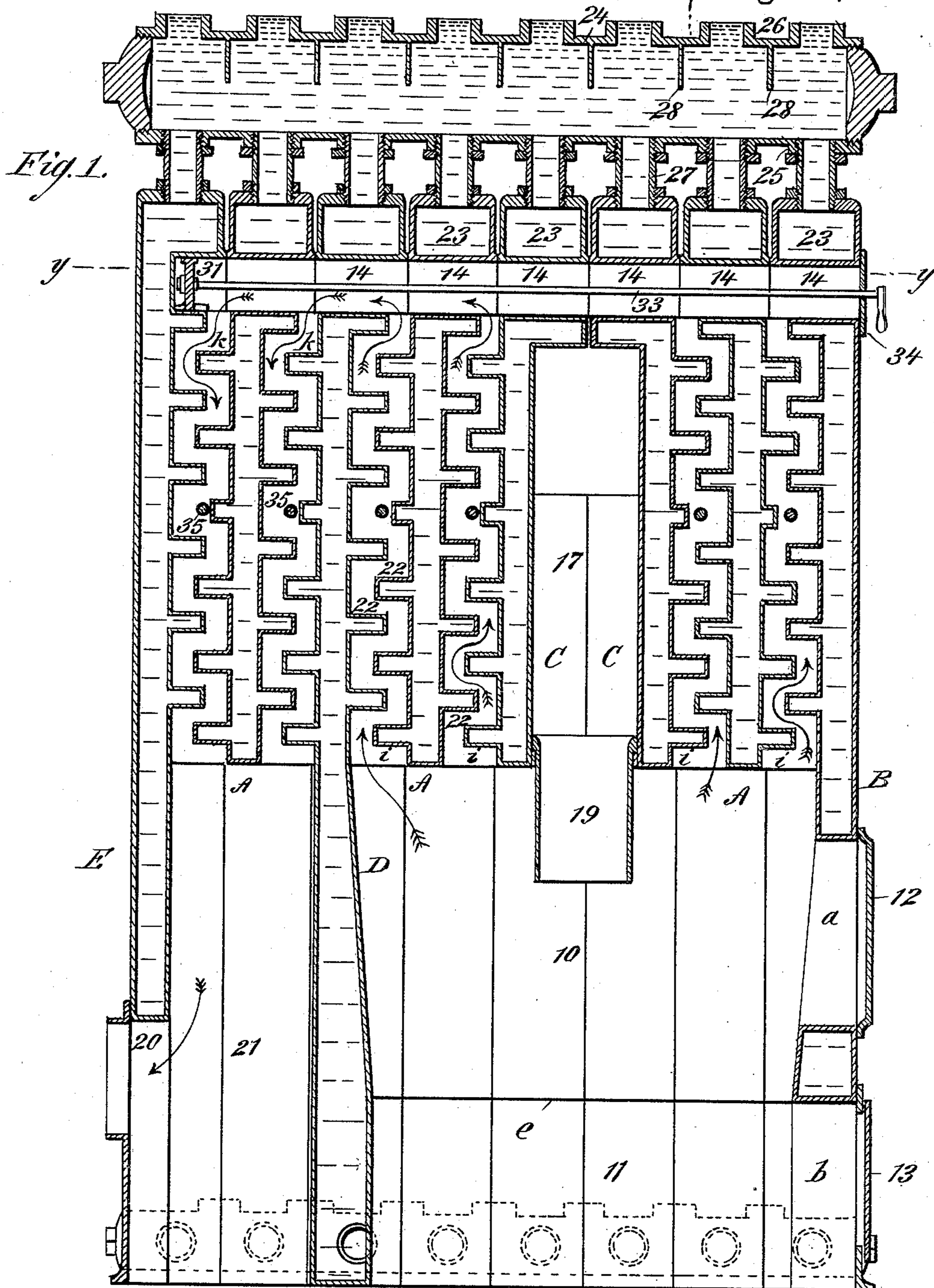
(No Model.)

3 Sheets—Sheet 1.

D. W. FLETCHER.
STEAM GENERATOR.

No. 409,781.

Patented Aug. 27, 1889.



WITNESSES:

Donn Twitchell
C. Sedgwick

INVENTOR:

D. W. Fletcher

BY

Munn & Co

ATTORNEYS.

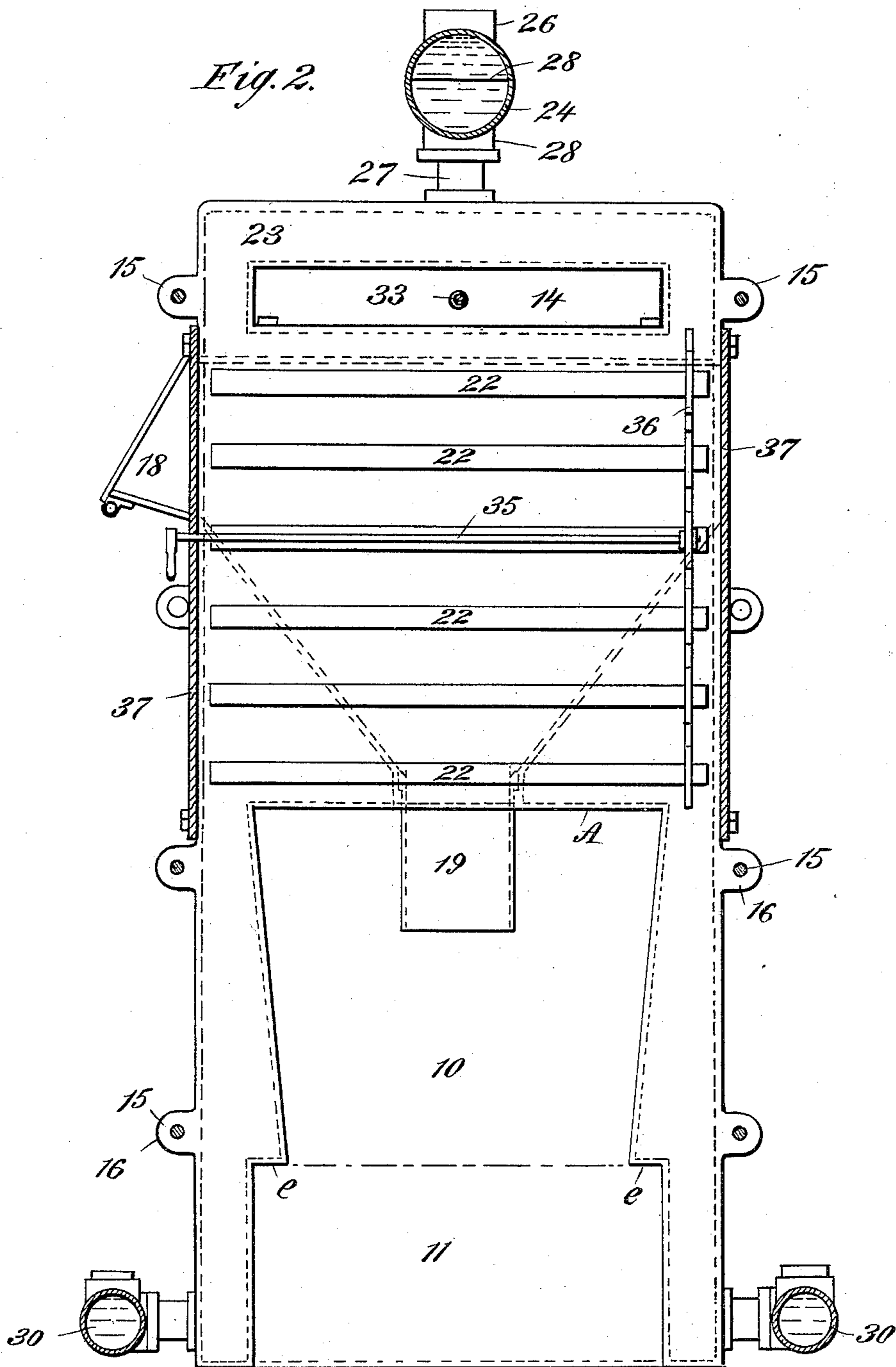
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Fig. 3. Patented Aug. 27, 1889.

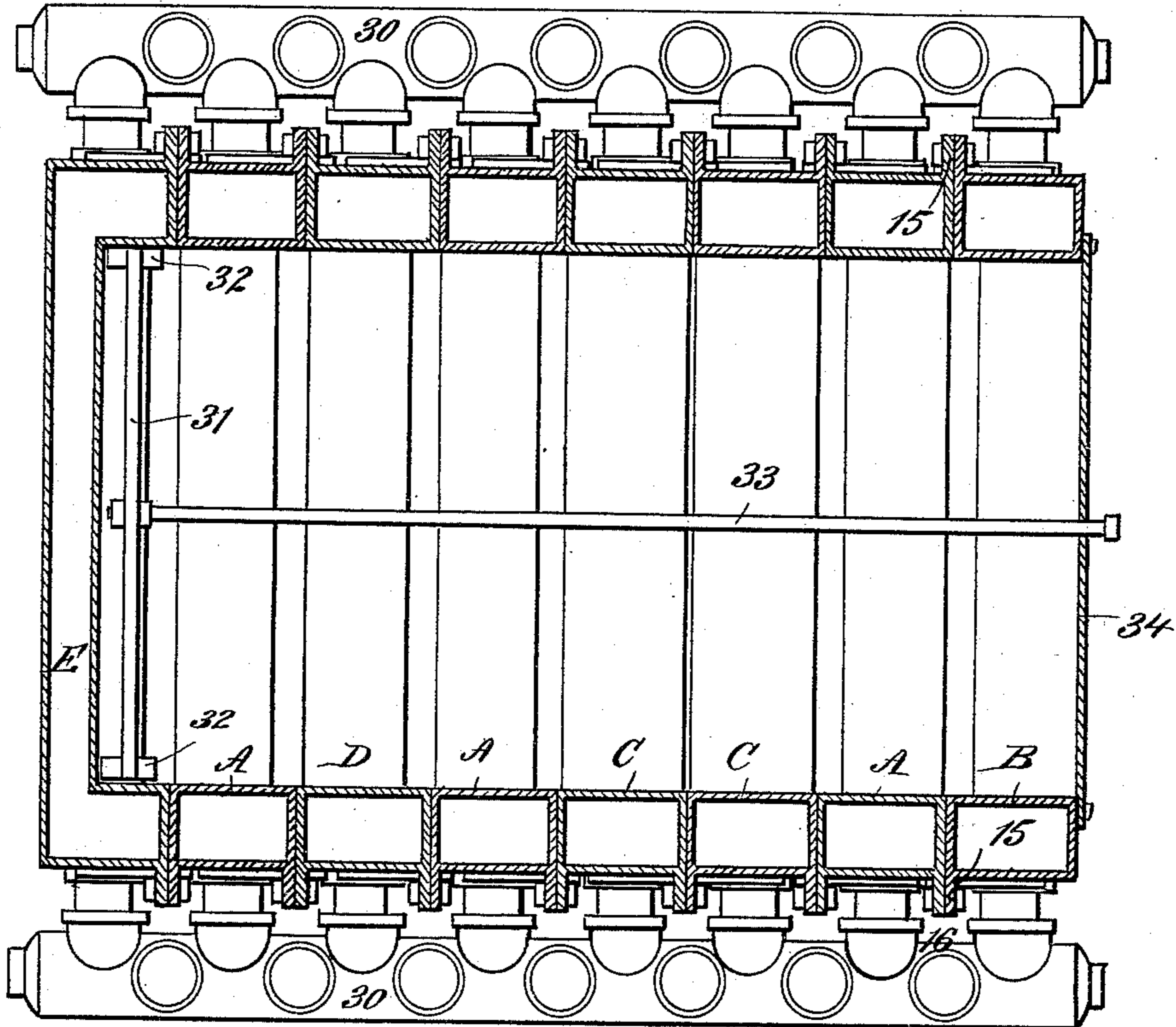
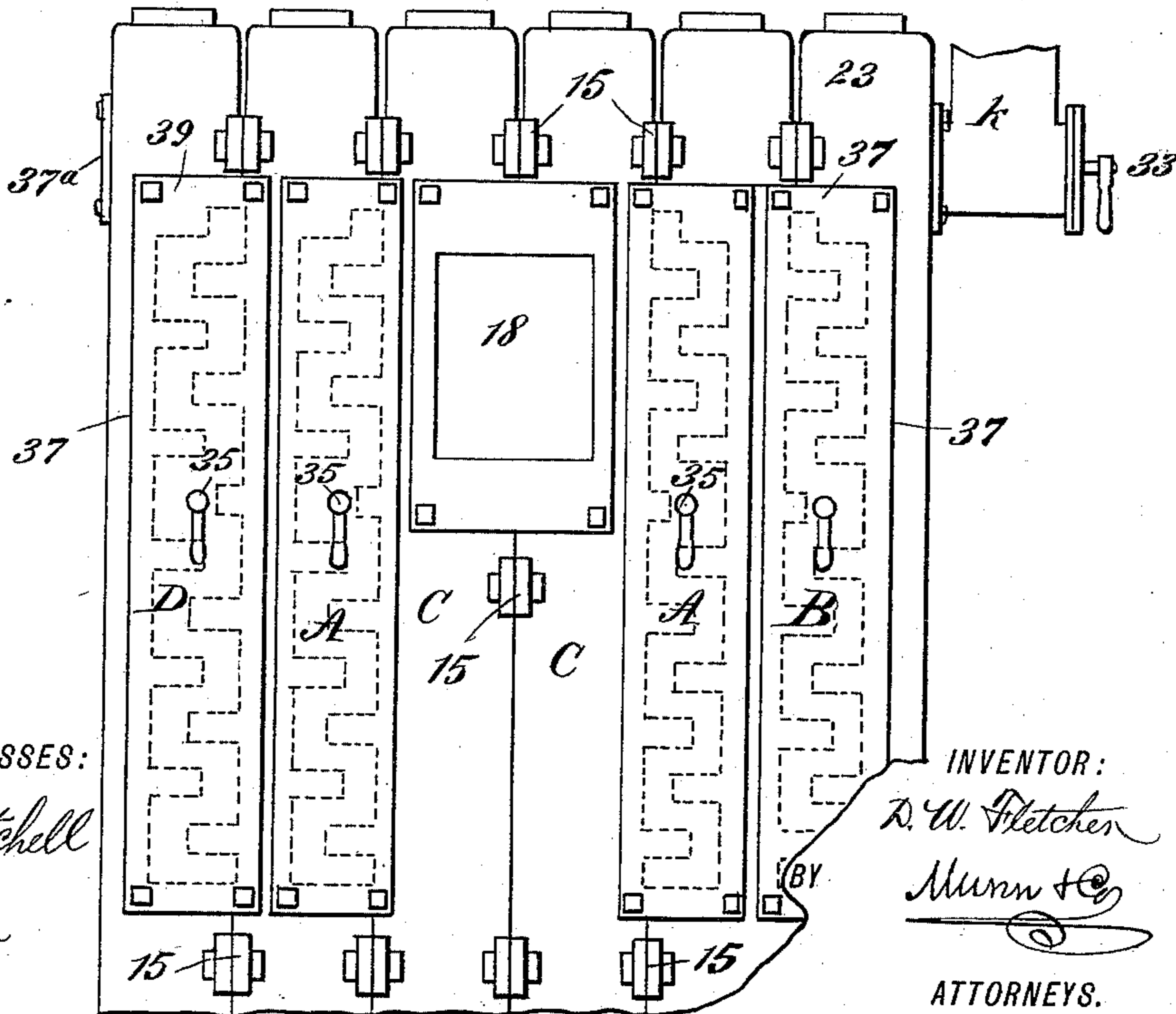


Fig. 4:



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UNITED STATES PATENT OFFICE.

DOC WILLIAM FLETCHER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-FOURTH
TO WALTER RODGERS FLETCHER, OF SAME PLACE.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 409,781, dated August 27, 1889.

Application filed December 3, 1888. Serial No. 292,525. (No model.)

To all whom it may concern:

Be it known that I, DOC WILLIAM FLETCHER, of St. Louis, in the State of Missouri, have invented a new and Improved Water-Heater and Steam-Generator, of which the following is a full, clear, and exact description.

The object of this invention is to provide a water-heater and steam-generator which may be so constructed and arranged as to use a minimum amount of fuel in the heating of the water or the generating of the steam, a further object of the invention being to provide for an increased capacity of the heater, and to provide practically independent water-heaters for each radiator or each section in the building; and to the ends named the invention consists of the novel constructions and combinations to be hereinafter described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a central longitudinal sectional elevation of my improved water-heater and steam-generator. Fig. 2 is a cross-sectional elevation taken on line *xx* of Fig. 1. Fig. 3 is a sectional plan view of the generator, taken on line *yy* of Fig. 1; and Fig. 4 is a side view of the upper portion of a smaller heater and one wherein all of the flues are direct flues.

In constructing such a heater as the one illustrated in the first three figures of the drawings, I employ boiler-sections of five types—such as those shown at A, B, C, D, and E—all of the sections, however, having common features, as will be hereinafter explained.

Of the sections above referred to the section B constitutes the front of the water heater or boiler, said section being provided with openings *a* and *b*, the opening *a* leading to the fire-chamber 10, while the opening *b* leads to the ash-pit 11, the openings being closed by doors 12 and 13, the frames of which doors are bolted to the outer walls of the section in the ordinary manner.

Near the upper portion of the section under consideration there is formed a flue 14, which registers with similar flues formed in the other boiler-sections. Against the inner face of the section B, I place one of the sections A, the

two sections being united by bolts, as 15, which pass through lugs 16, that extend from the ends of the sections, and to the sections A, I bolt one of the sections C, the other section C being reversed and bolted to place against its like section, the sections C being shaped so that when bolted together they will form a fuel-receptacle 17, said receptacle being provided with a trap or door 18, the frame of which door is bolted to one of the side walls of the generator.

The lower walls of the fuel-receptacle are inclined, as indicated by dotted lines in Fig. 2, and at the lower portion of the receptacle there is arranged a delivery-nozzle 19, which leads downward into the fire-chamber 10. The section D is bolted to the rear section C; or one or more sections A may be interposed, the introduction of the sections A depending upon the desired size of generator. The section D forms a water-back for the chamber 10, extending across the rear end of said chamber, as shown in Fig. 1.

Beyond the section D, I place the section E, interposing one or more sections A, if desired, and this section E is formed with a draft-exit 20, the space between the section E and the section D forming a soot-chamber 21. The walls of the several sections which form the sides of the fire-chamber are inclined, as shown best in Fig. 2, thus forming shoulders *e*, beneath which the grate-frame rests, the shoulders acting as protectors for the journals and bearings should a rotary grate be employed.

All of the generator-sections are formed with pockets 22, which are arranged to interlock, as shown clearly in Fig. 1, this arrangement producing an immense heating-surface and providing for the heating of the water within the several sections through the medium of a minimum amount of fuel.

As before stated, the boiler-sections are all provided with flue-openings 14, and above these openings there are water-chambers 23, an upper communication between said chambers being secured by means of a vessel 24, which I shall hereinafter designate as a "distributor." This distributor is formed with two sets or series of nipples, as shown at 25 and 26, the lower nipples 25 being engaged by tubes 27, that lead to the chambers 23, while the upper

nipples 26 are arranged for connection with the several service-pipes, each pipe leading to a separate radiator or to a separate section of the building.

5 Between each of the nipples 26, I arrange deflecting-plates 28, the purpose of said plates being to direct the flow of liquid from the tube 27, that is below and between any pair of plates, to the discharge-nipple that is above
10 and between said pair of plates, whereby I provide for the heating of a radiator or building section from a single boiler-section, and I practically secure an independent circulation through said section, as will be under-
15 stood.

At the bottom communication between the several generator-sections is established through the medium of pipes or tubes 30, which communicate with each of the sections,
20 and to which the return-flow of water from the radiators is delivered.

In such a generator as the one shown in the first three figures of the drawings, the heated gases and products of combustion
25 will pass through the flues *i* between the boiler-sections upward in the direction of the arrows shown in connection with said flues, thence into the flue-chamber formed by the flue-openings 14 to the downflues *k*, and
30 thence to the soot-chamber and out through the opening 20. With such a multiplicity of flues it is desirable that some provision be made for the ridding of the flues from soot and the unconsumed portions of the fuel car-
35 ried up by the draft and deposited within the flue-openings 14 and the flues *i* and *k*; and to this end I arrange a strip 31 within the flue 14, said strip being provided with shoes 32, of a width sufficient to carry the strip over
40 the flues *k* and *i*, and to this strip 31, I connect a rod or handle 33, which extends outward through an aperture formed in a plate 34, that is bolted to the front of the gener-
45 ator, the arrangement being such that by drawing the handle or rod 33 forward the strip 31 will clear the flue from soot, said soot falling into the flues *k* and *i*, and to clear these flues *k* and *i*, I provide a strip 36 of proper form to fit therein, the form of said
50 strip being indicated by dotted lines in Fig. 4, each strip being provided with a rod or handle 35, which extends outward through one of the side walls of the generator, the soot gathered by the strips 36 being forced
55 over the ends of the projections constituting the pockets 22, said projections being shorter than the width of the boiler-section, thus leaving a space between the ends of the pro-
60 jections and the outer facing-plates 37, that are bolted to the side walls of the boiler, said plates constituting the end walls of the flues *i* and *k*.

In Fig. 4 I illustrate a construction where-
65 in the soot-chamber and the flues *k* are dispensed with, the section E and the last section A being removed and the section D forming the back of the generator. In this

case all flues are direct flues, and the products of combustion pass off through a pipe K, the back of the flue 14 being closed by a
70 plate 37^a.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A water-heater formed of vertical transverse spaced sections having longitudinally-
75 extending interlocking pockets 22, forming zigzag flues *i*, substantially as set forth.

2. A water-heater formed of vertical transverse spaced water-sections having aligned lower openings 10, forming the fire-chamber,
80 longitudinally-extending interlocking pockets above said openings forming zigzag flues *i*, and aligned openings near their upper ends forming a horizontal flue 14, into which the flues *i* discharge, substantially as set forth. 85

3. A water-heater formed of vertical transverse spaced water-sections A B C D E, hav-
ing interlocking longitudinally-extending pockets forming zigzag flues, aligned open-
90 ings near their upper ends forming flue 14, communicating with the flues *i*, outlet-opening 20 in the lower end of the rear section E, a water-back formed by section D, the fire-chamber 10, formed in front thereof, and soot-
95 chamber in rear thereof, a pipe connecting the lower ends of said sections and a distributor communicating with the upper ends of said sections, the front section having fire-chamber and ash-pit doors, substantially as
100 set forth.

4. A water-heater formed of transverse ver-
tical water-sections having aligned openings forming a fire-chamber, interlocking longi-
tudinally-extending pockets forming zigzag
105 flues *i*, and openings forming top flue 14, two of said sections above the fire-chamber having a fuel-magazine 17 formed between them, sub-
stantially as set forth.

5. In a water-heater, the distributor 24, having aligned openings in its top and bot-
110 tom, and transverse deflecting-plates 28, depending from the upper side of the interior of the distributor between each top opening, substantially as set forth.

6. In a water-heater, the combination, with
115 a series of sections formed with side pockets, and flue-sections 14 and flues *i* *k*, of flue-cleaners 31 and 36, arranged substantially as described.

7. The combination, with a water-heater
120 having vertically-ranging flues and a horizontal flue communicating with the upper ends thereof, of the horizontal and vertical cleaners having operating-rods extending to the outer sides of the heater, substantially as
125 set forth.

8. A water-heater made up of sections A, B, C, D, and E, whereby there are formed flues *i* *k* and 14, a fire-chamber, an ash-pit, and a soot-pit, substantially as described.

DOC WILLIAM FLETCHER.

Witnesses:

LEO B. SWEENEY,
WM. J. MURPHY.