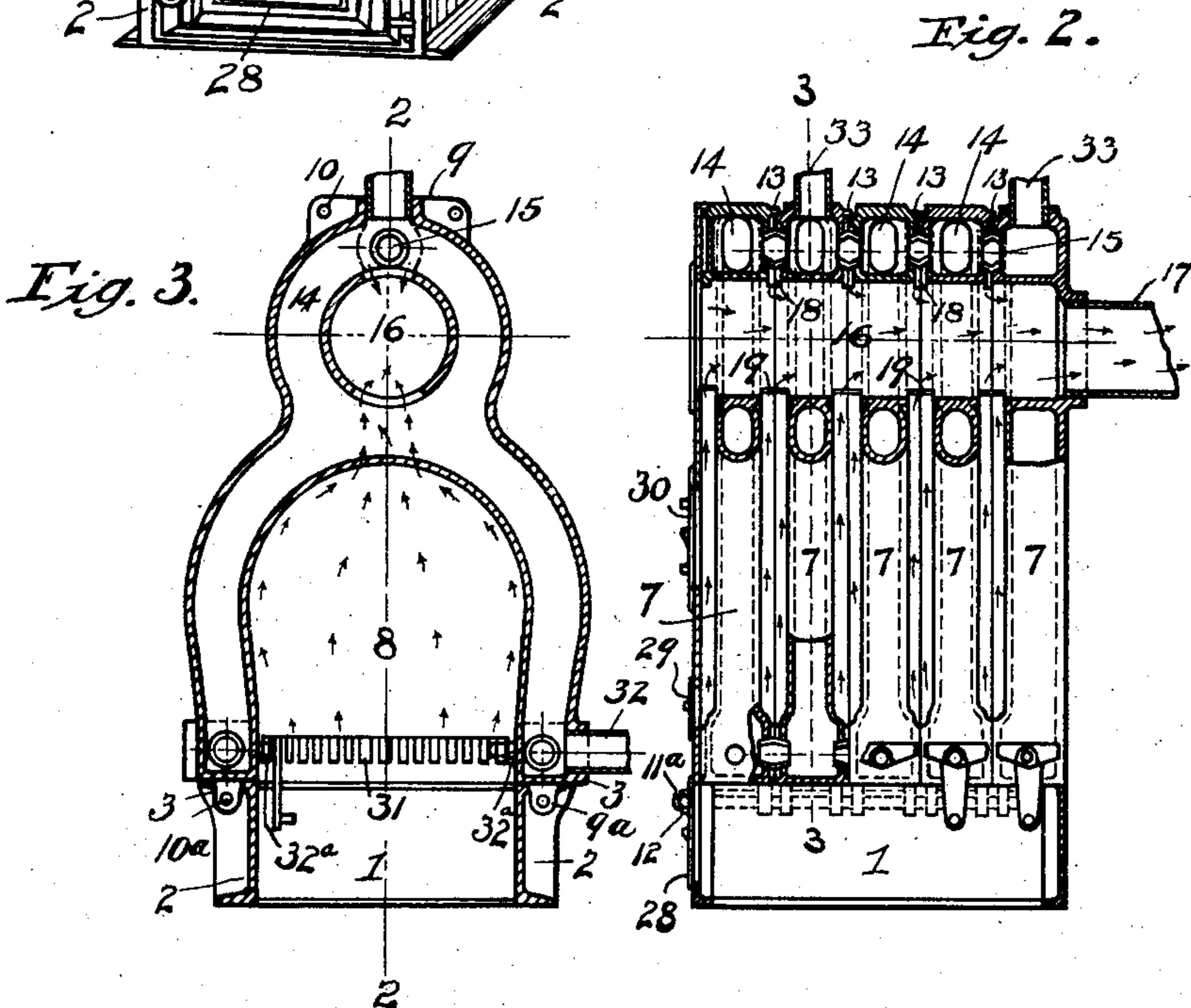
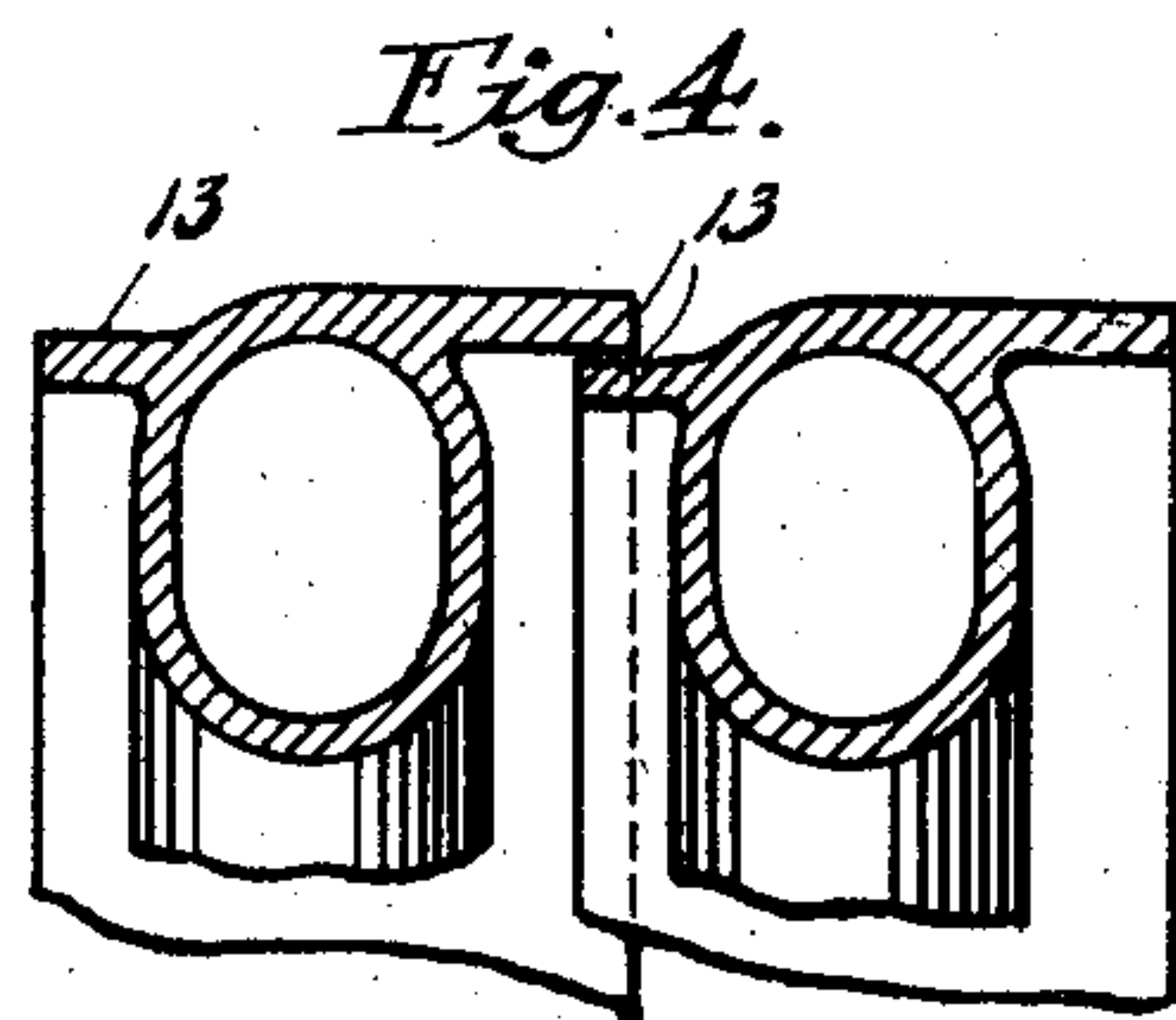
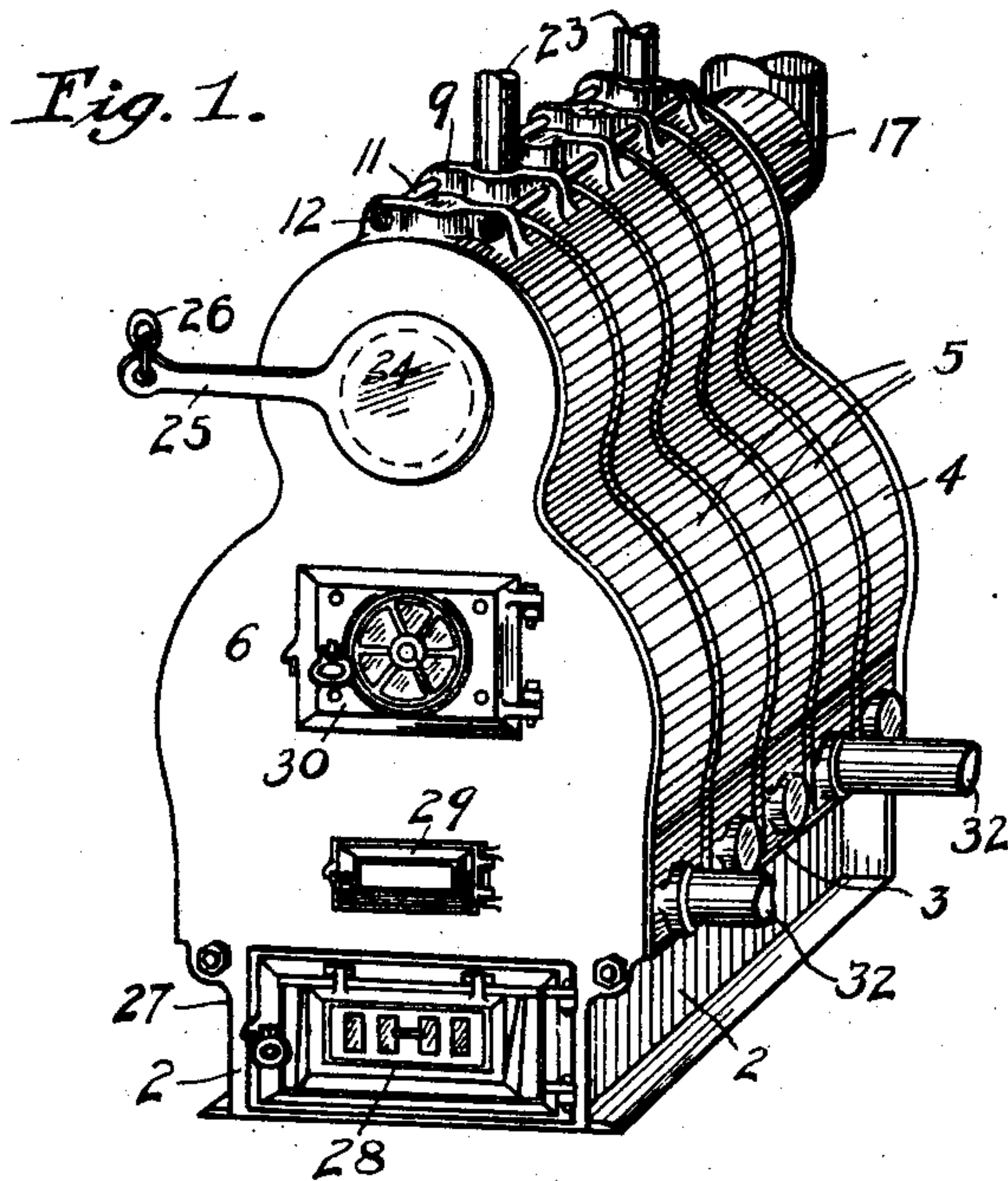


D. F. GREENAWALT,
HOT WATER HEATER,
APPLICATION FILED MAR. 30, 1908.

919,344.

Patented Apr. 27, 1909.

2 SHEETS—SHEET 1.



Inventor

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Witnesses

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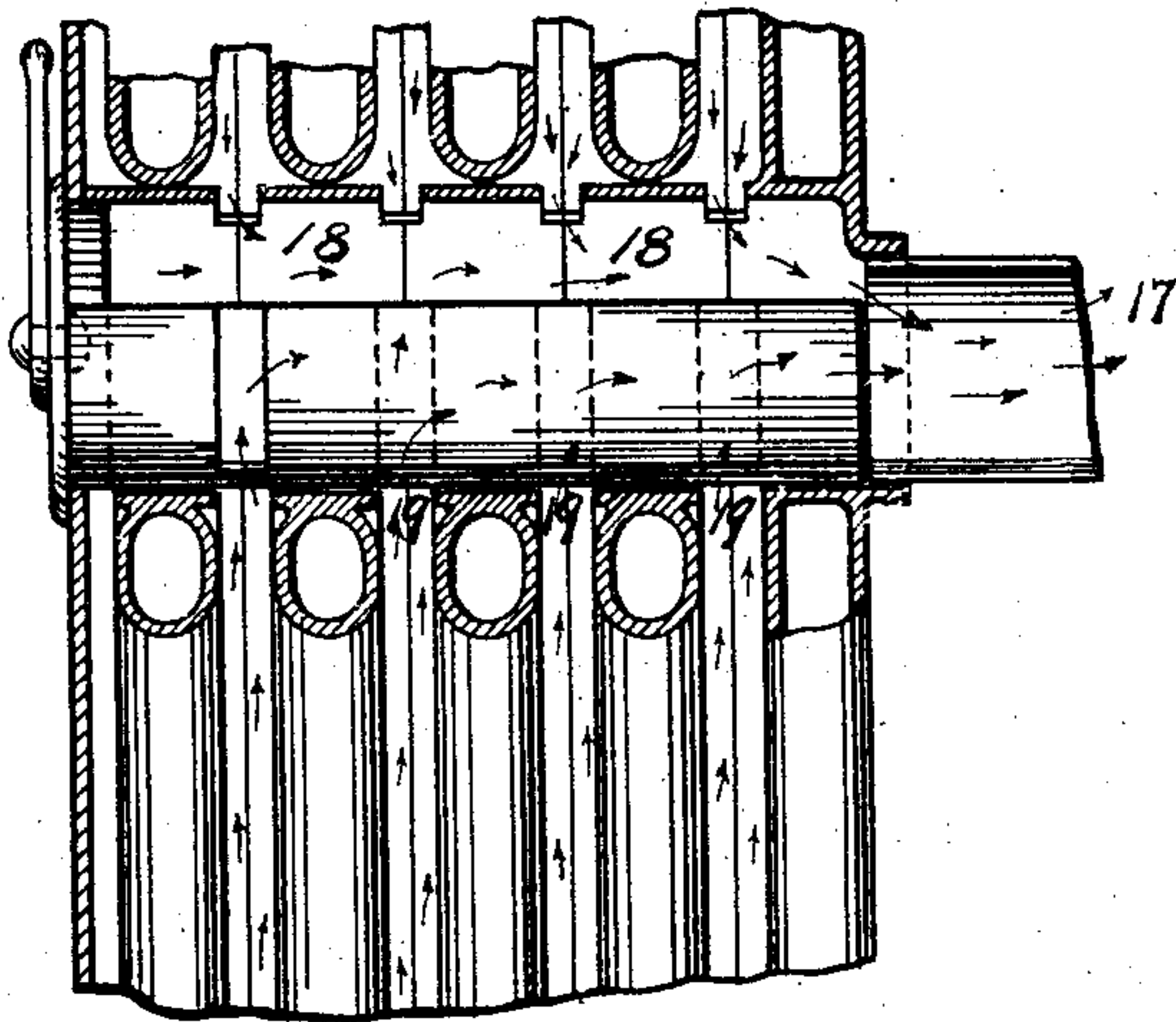


Fig. 5.

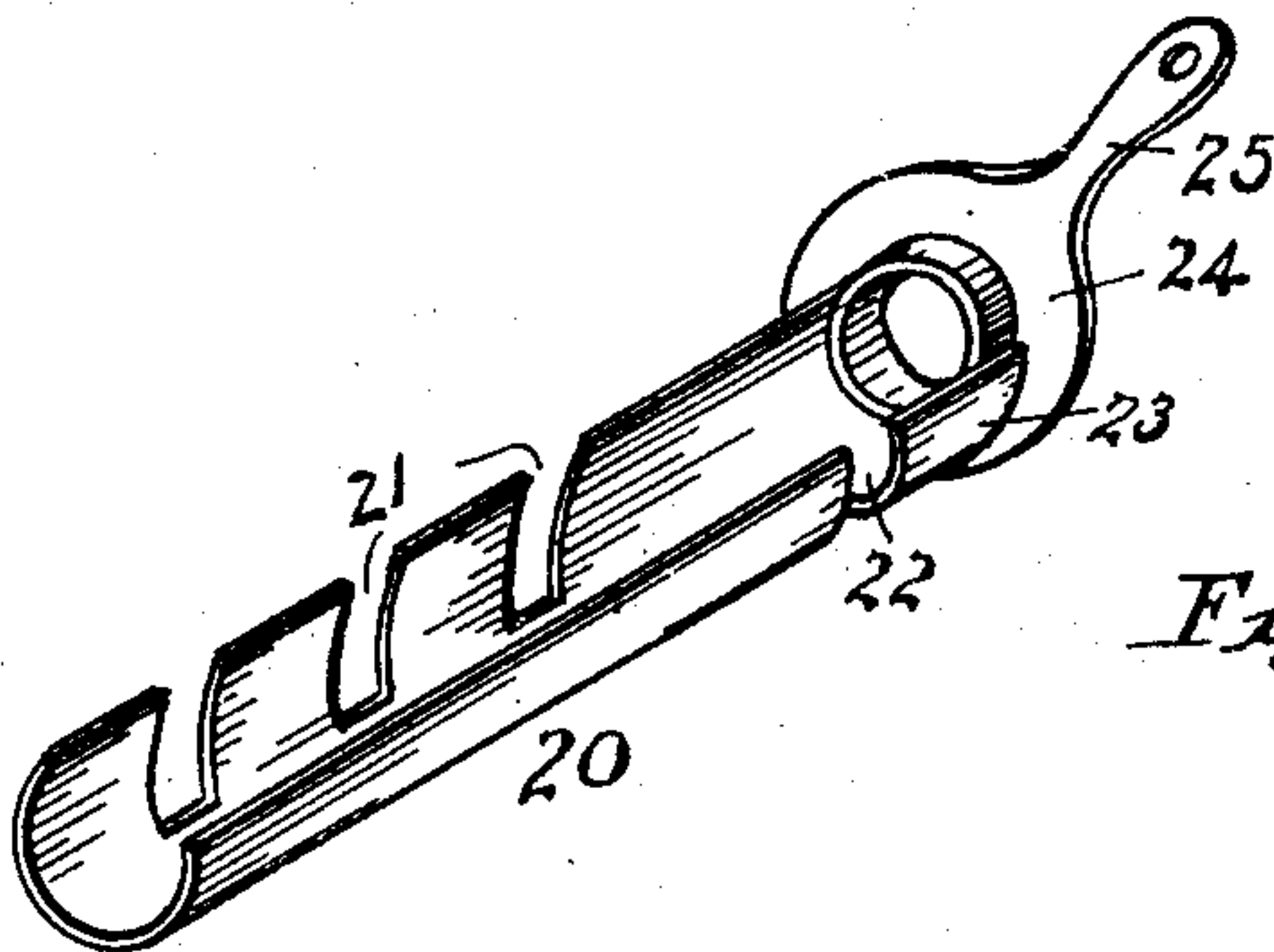


Fig. 6.

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UNITED STATES PATENT OFFICE.

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HOT-WATER HEATER.

No. 919,344.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed March 30, 1908. Serial No. 424,208.

To all whom it may concern:

Be it known that I, DAVID F. GREENAWALT, a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following is a specification.

The present invention relates to water heaters and has specially in view an improvement in water heaters of the sectional type and combining the same with a novel form of damper whereby the various draft flues may be simultaneously regulated.

With the above and many other objects in view the present invention contemplates utilizing hollow arch shaped sections which are so constructed that they will present a lower heating surface which surrounds the fire chamber and an upper cylindrical portion which is in communication with said fire chamber and the smoke flue, whereby an additional heating surface is provided for the water at the top of each section, and in arranging in said upper cylindrical portion a rotary damper for regulating the admission of the products of combustion to said cylindrical portion.

In carrying out the invention various modifications in details of construction may be resorted to, but a preferred and practical embodiment thereof is shown in the accompanying drawings, in which like characters of reference have been used to designate corresponding parts.

Referring to said drawings—Figure 1 is a perspective view of the improved sectional water heater. Fig. 2 is a longitudinal sectional view taken on the line 2—2, Fig. 3. Fig. 3 is a transverse sectional view taken on the line 3—3, Fig. 2. Fig. 4 is a detail sectional view of the upper portion of two of the sections showing their overlapping flanges. Fig. 5 is a detail sectional view of the upper portion of Fig. 1, showing the relative arrangement of the upper cylindrical portion and the damper therein. Fig. 6 is a perspective view of the damper.

It is contemplated using the present invention in connection with the usual type of ash pit base 1, the side walls 2 of which are pref-

erably of angle iron which present the broad upper supporting surface or flange 3 upon which the base of the rear and intermediate sections 4 and 5, respectively, are supported. Said sections 4 and 5, and also the front section 6 are of a hollow arch shape, the hollow water legs 7 of which form the side walls of the fire box of fire chamber 8. The top and bottom of all the sections are provided with offstanding flanges 9—9^a, through each of which end openings 10—10^a are formed for the reception of locking bolts 11—11^a carrying nuts 12, by means of which said sections may be locked together and retained in a relatively immovable position. All of said sections, at their meeting edges, are also provided with flanges 13 which overlap the flange of the adjoining section when said sections are brought together, and to insure of a tight connection between the overlapping flanges, suitable packing may be interposed therebetween.

The upper portion of the water legs 7 terminate in a hollow cylindrical drum 14 which has a nipple connection 15 with the drum of the adjoining section thereby permitting of an unobstructed circulation of water up the water legs 7 of one section, around the drum 14, through the nipple connection 15 and to the drum of the next section.

It will be observed by reference to Fig. 2 of the drawings that when the sections are bolted together a continuous open cylinder 16 is formed in the drum 14 of the water heater, said cylinder 16 extending from the front section 6 to the smoke flue 17 which is connected to the rear section, intermediate upper and lower openings 18—19 being formed therein, between the water legs 7 to permit the entrance thereto of heat and other products of combustion.

A damper 20 is rotatably mounted in the cylinder 16, and consists of a semi-cylindrical structure one edge of which is provided with a plurality of circulation notches 21, and its other edge being preferably provided with but one notch 22. In its operative position, one end 23 of the damper 20 projects slightly beyond the outer face of the front section 6, and has mounted thereon a cap 24 carrying an operating handle or lever 25 which may

have a flexible connection 26 with suitable damper regulating or controlling mechanism, not shown.

It will be observed that the damper 20 extends entirely through the cylinder 16 and terminates adjacent to the smoke pipe or flue 17, and that the plurality of notches 21 formed in one edge and the single notch formed in the other edge are so located that the damper may be rotated to aline them with all but one of the upper flue openings 19 and one of the lower flue openings 18, or vice versa. By this relative arrangement of notches and upper and lower flue openings, it is possible to obtain various regulations of the amount of heat from the fire chamber that is admitted to the upper cylinder 16. And it will be further observed that the end cap 24 carried by the damper is of a size to effectually seal the end of said cylinder, thereby preventing the admission thereto of any of the cool, outside air.

The front section 6 is preferably provided with an extended lower portion 27 which forms a front casing for the ash pit, and also has an ash pit door 28, a draft door 29, and a stoking door 30 hinged thereto.

Any preferred type of grate may be used in connection with this invention, an example thereof being shown in Fig. 2 in which a rocking grate 31 is mounted on lugs or ledges 32^a carried by the lower, interior, portions of the water legs.

The circulation of water through the sections is preferably from the bottom to the top to obtain greater benefits from the fire owing to the location of the water legs relatively to the fire chamber, and therefore it is proposed to admit the water through the inlet pipes 32 which causes it to have an upward trend through the hollow water legs, around the drums 14 and through the nipple connection to the drum of the adjoining section, and so on until it reaches one of the upper outlet pipes 33.

From the foregoing description it will be observed that the described construction and arrangement of parts permits of the water sections being kept constantly in a highly heated condition owing to the fact that the water legst hereof surround the fire chamber, and the further fact that the products of combustion are conducted around the drum of each section, which insures of all portions of the said sections being practically at all times in contact with the fire. And it will be further observed that through the described arrangement of upper hollow drum of each section, an improved form of heating cylinder is provided which is especially adapted for the described type of rotary damper through the medium of which the drafts of the fire are so controlled as to provide a communication be-

tween the fire and the upper and lower flue openings of the cylinder so as to assure of there being at all times a circulation of the products of combustion around said drums.

As a further advantage of this type of heater may be mentioned the self-cleaning element embodied in the rotary damper. The movement of this damper in the drum serves to clean the surface of the sections from soot and ashes which naturally collect and obstruct the heating effects.

Claims:—

1. A water heater consisting of a plurality of hollow sections rigidly connected together, each of said sections being provided with water legs inclosing a fire chamber and an upper hollow drum having an open cylinder provided with flue openings which communicate with the fire chamber, and a damper rotatably mounted in said cylinder and provided with notches which coöperate with the said flues in the cylinder.

2. A water heater consisting of a plurality of arch shaped hollow sections provided with water legs inclosing a fire chamber and an upper hollow water drum having a cylinder which communicates with the fire chamber at points between the sections, and a horizontally rotatable damper extending longitudinally through said cylinder and having means to regulate the communication between the fire chamber and the cylinder.

3. A water heater consisting of a plurality of arch shaped hollow sections provided with water legs inclosing a fire chamber and an upper hollow drum having a cylinder provided with a line of upper and lower flues which communicate with the fire chamber, and a damper mounted in said cylinder and provided with circulation notches which coöperate with said flues to regulate the draft of the fire chamber.

4. A water heater consisting of a plurality of arch shaped hollow sections provided with hollow water legs inclosing a fire chamber and an upper hollow drum having a cylinder provided with a line of upper and lower flues which communicate with the fire chamber, and a damper rotatably mounted in said cylinder and provided with a plurality of notches adapted to be selectively alined with either the upper or lower flues of the cylinder, said damper being also provided with an end cap which forms a closure for one end of said cylinder.

5. A water heater consisting of a plurality of hollow arch shaped sections rigidly connected together and being provided with hollow water legs which inclose the fire chamber and an upper drum having a longitudinal cylinder provided with a line of upper and lower flues which communicate with the fire chamber, a damper rotatably mounted in said cylinder and provided with circulation

notches which are adapted to be selectively placed in communication with either the upper or lower line of flues in the cylinder, an end cap carried by said damper and forming a closure for the cylinder, and an operating handle carried by said cap whereby rotation may be imparted to said damper.

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

DAVID F. GREENAWALT.

Witnesses:

D. LLOYD CLAYCOMB,
N. E. GER.