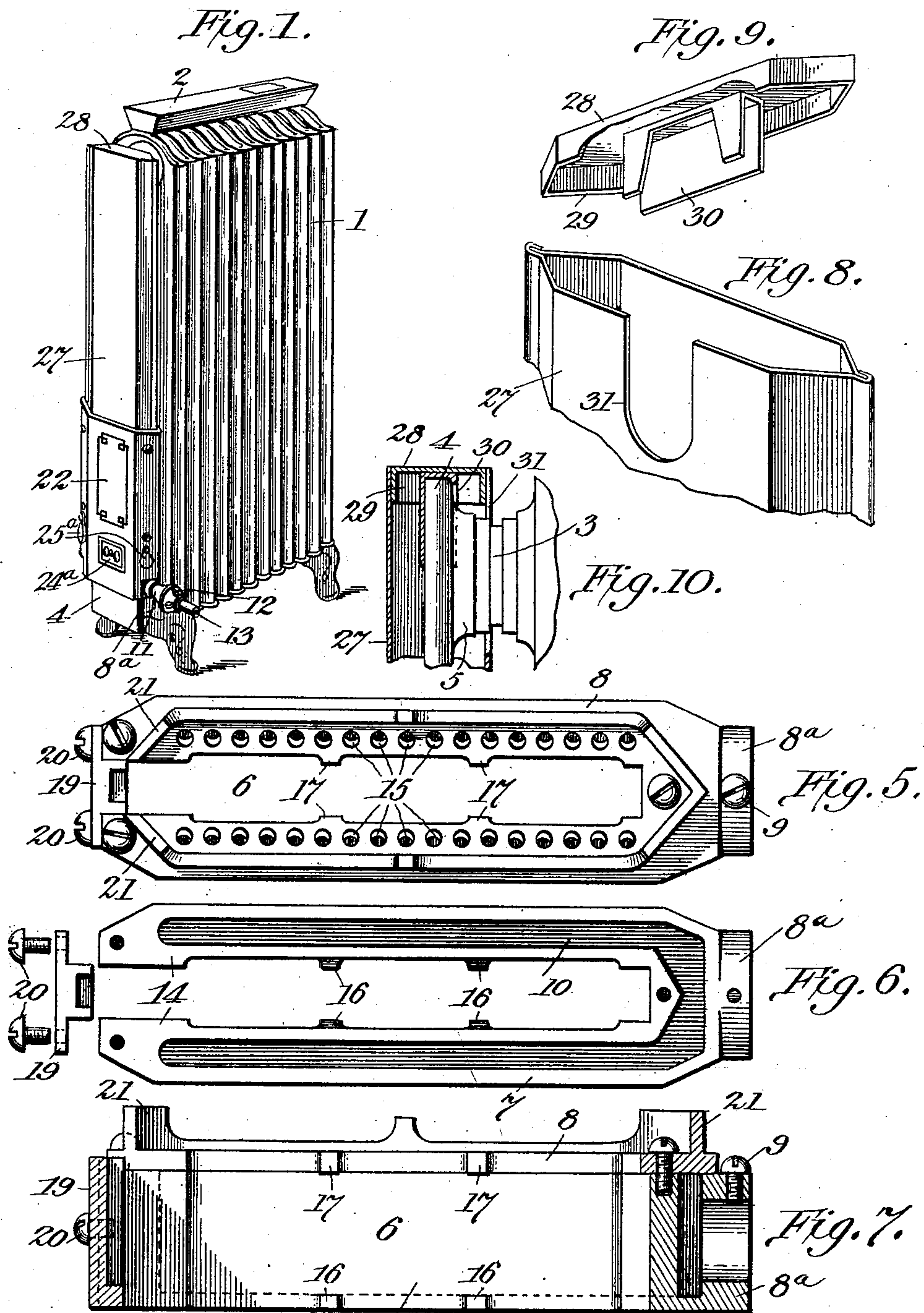


H. T. OFFTERDINGER.
PORTABLE HOT FLUID HEATING APPARATUS.
APPLICATION FILED SEPT. 18, 1906.

912,320.

Patented Feb. 16, 1909.

2 SHEETS—SHEET 1.



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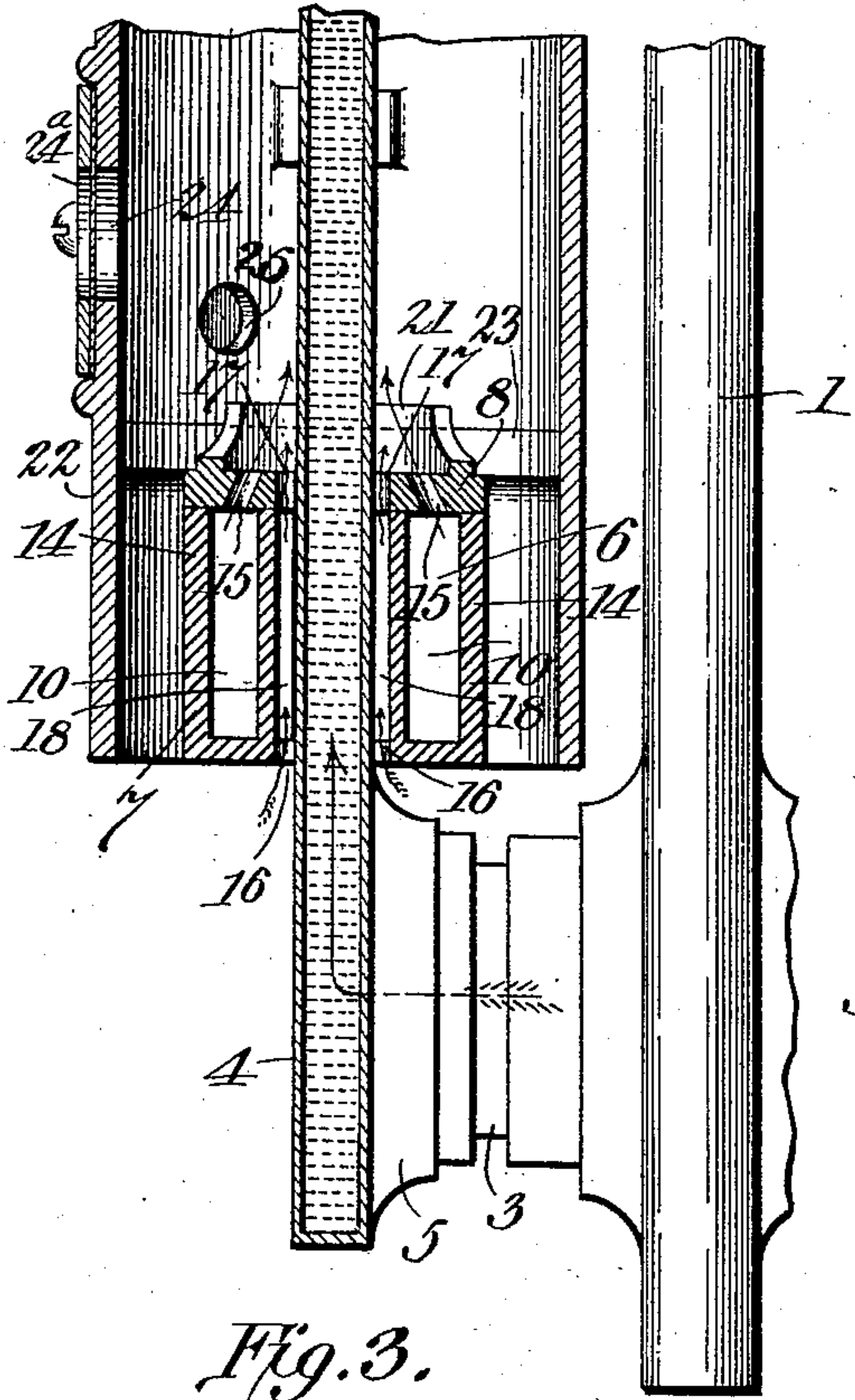


Fig. 3.

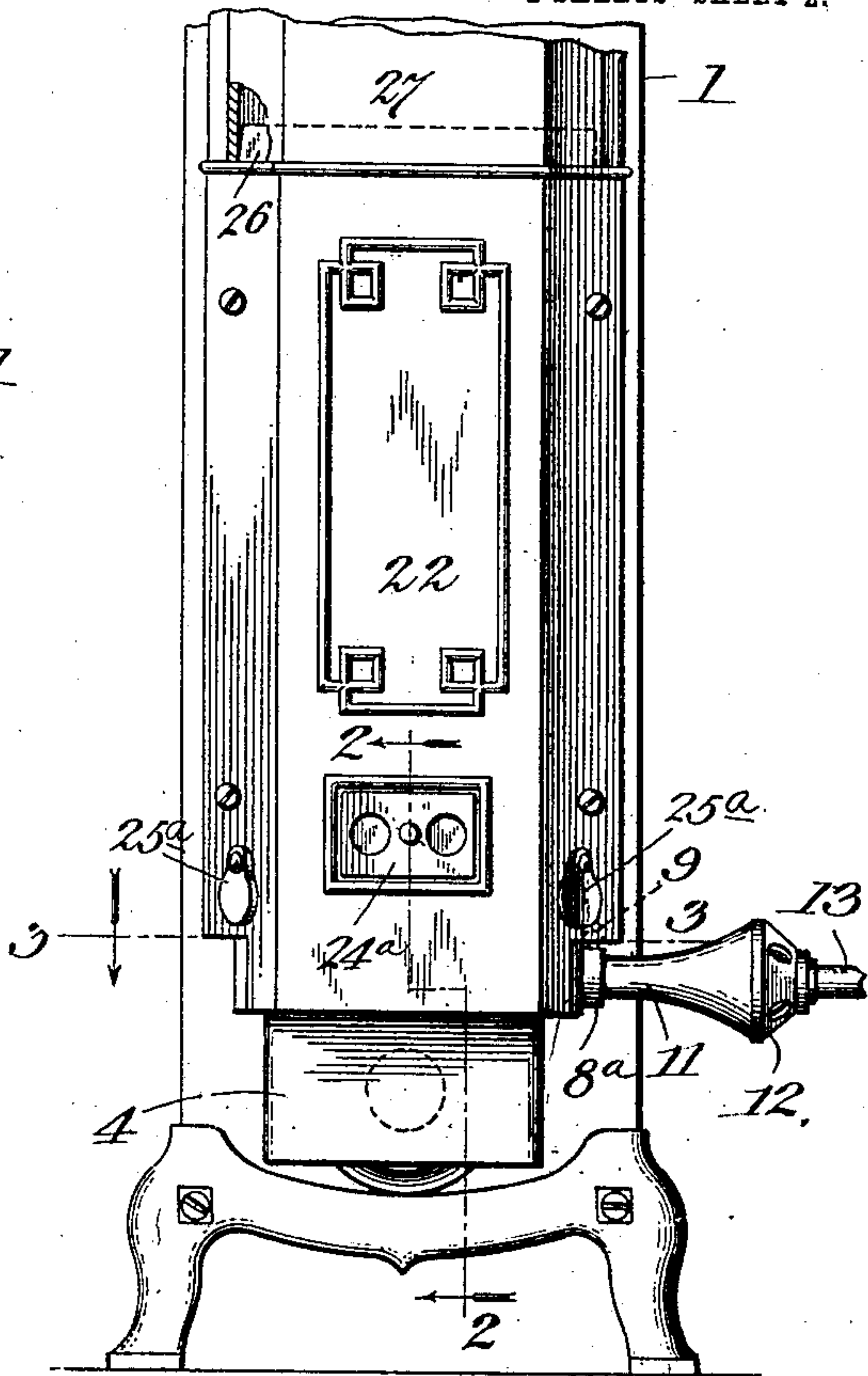
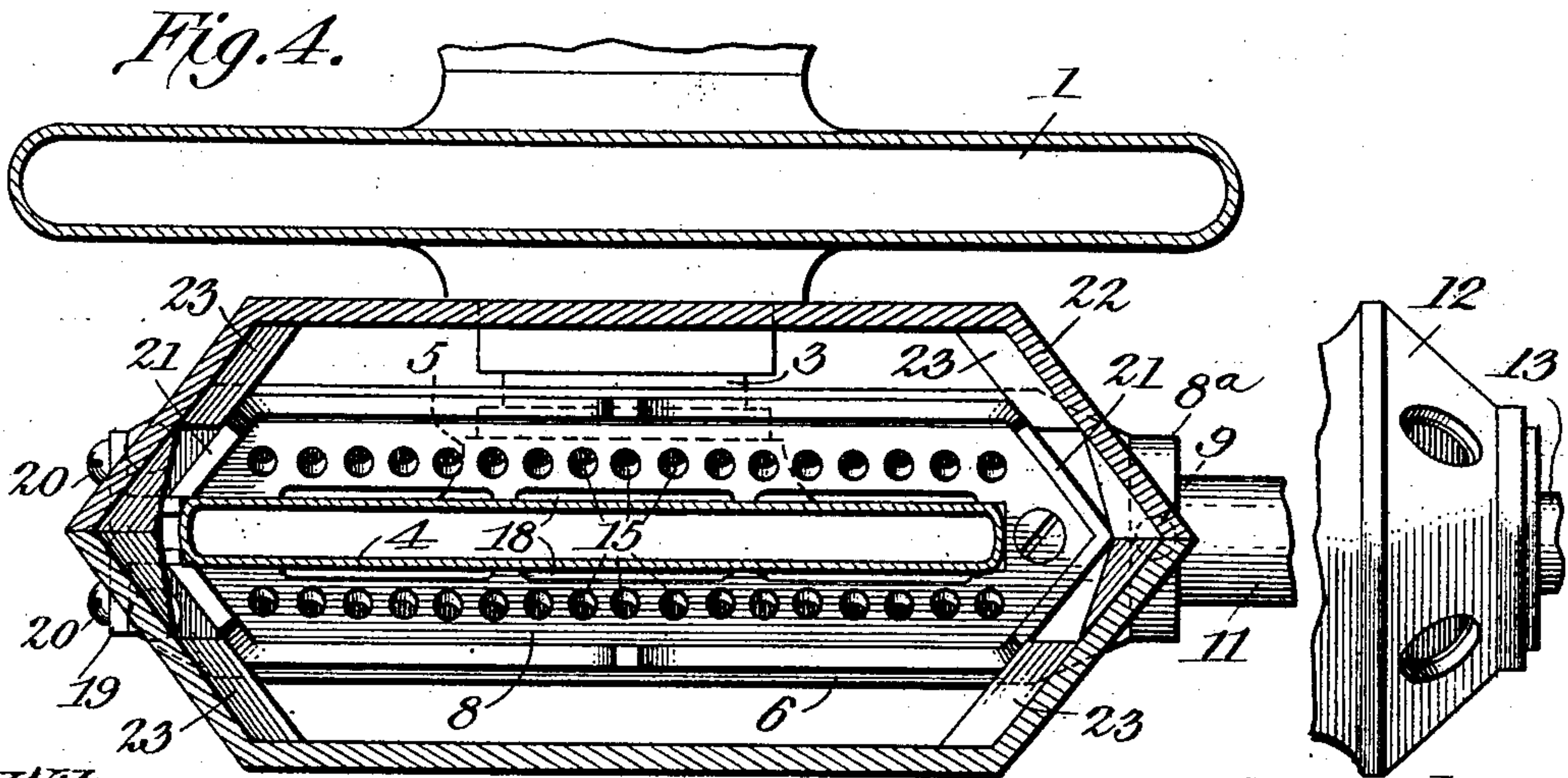


Fig. 2.



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UNITED STATES PATENT OFFICE.

HENRY T. OFFTERDINGER, OF WASHINGTON, DISTRICT OF COLUMBIA.

PORTABLE HOT-FLUID HEATING APPARATUS.

No. 912,320.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed September 18, 1906. Serial No. 335,059.

To all whom it may concern:

Be it known that I, HENRY T. OFFTERDINGER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Portable Hot-Fluid Heating Apparatus, of which the following is a specification.

My invention relates to portable hot fluid heating apparatus of the radiator class, and more particularly to that type of apparatus described in my Patent Number 830,359, granted Sept. 4, 1906. In apparatus of this character, water or other suitable fluid is heated and thereby caused to circulate through a series of radiator sections, the combined sections making up the radiator being portable.

One object of the invention is to provide improved means for supplying heat to the circulating medium, to the end that a radiator equipped with my invention may have its body of circulating fluid quickly and intensely heated.

Other objects will appear from the following description.

Radiators of the type to which this invention is directed, are chiefly though not exclusively, useful to heat rooms or apartments not connected to a permanent heating system of a building. Such portable apparatus may be moved from place to place, and used wherever there may be a suitable source of fuel supply, such as gas from an ordinary gas-fixture, or the like. My invention is not limited, however, to use with gaseous fuel, but, in certain of its features, is also applicable to apparatus employing liquid fuel, such as oil or alcohol.

With the above and other objects in view, the invention consists in a portable hot fluid heating apparatus or radiator, and associated burner, possessing the features hereinafter described, and illustrated in the accompanying drawings; and also in several novel sub-combinations.

I will first describe my invention in detail, and then point out what I regard as the novel features thereof in the appended claims.

In the accompanying drawings, forming part of this application, and illustrating what I regard as the best known embodiment of my invention; Figure 1 is a perspective view of the radiator complete. Fig. 2 is a partial end elevation of the same. Fig. 3, is a fragmentary section on line 2—2 of Fig.

2, looking in the direction of the arrow. Fig. 4 is a section, on an enlarged scale, taken along line 3—3 of Fig. 2, looking in the direction of the arrow. Fig. 5 is a plan view of the burner. Fig. 6 is a similar view, but showing the end plate and cover removed. Fig. 7, is a central vertical section of the burner. Figs. 8, 9, and 10 are details of the upper end of the flue, Fig. 10 showing its connection with the radiator.

In the drawings, 1 represents the radiator, which may be of any well known or approved pattern, and may be provided with an expansion box or tank 2. Through this radiator, the water is caused to circulate, and the same constitutes the heat-radiating medium, by which the room or other place in which the same is located, is warmed. In order to quickly and efficiently heat the water the auxiliary device which forms the subject of this invention is provided. Said device consists of a supplementary tube or passage 4, arranged at one end of the radiator, and substantially parallel to the radiator tubes. For brevity this device will be referred to as a "heating-tube." In the preferred construction, the heating tube is disposed substantially vertically, and is in communication at its opposite ends with the fluid circulating system of the radiator by means of any suitable connections 3 and flanges 5, as clearly shown in the Figs. 3 and 10. In this way, when the liquid in the tube is heated, it is caused to circulate through the radiator, as is well known. In order to heat the tube and its contents, I provide a burner, designated in its entirety by the numeral 6. Said burner comprises a body portion 7 surmounted by a perforated top or cover 8. The burner carries a neck 8^a and set screw 9 for connection with the pipe 11 leading from the mixing device 12. A pipe or conductor 13 supplies the fuel. In the body of the burner is formed the chamber or cavity 10, extending into both legs 14, of the same, into which the fuel passes, before issuing from the orifices in the cover. The cover 8 is provided with a double row of perforations, as in my prior patent above referred to. As shown in said patent, however, these perforations are vertical, while in the present invention I make them inclined inwardly, as clearly shown in Fig. 3. The heating tube 4 passes down between the two legs of the burner, and is of a relatively thin, flat cross-section, as shown in Fig. 4. By virtue of

the inclined position of the perforations or ports 15, the flame issuing therefrom is deflected inwardly and played directly against the sides of the tube 4, as indicated by the arrows in Fig. 3, thereby producing a very efficient and intense heating thereof. I regard this as one important feature of my invention. Although the legs of the burner embrace the heating tube they are not in contact therewith. The top and body portions are provided with internally projecting lugs, 17 and 16 respectively, which bear against the tube 4, and preserve a space 18, between the tube and the inside of said burner. This permits a free supply of air to the inside of the flame, and thereby insures complete combustion. The legs of the burner are held together at the end by a notched plate 19, secured by screws 20. The object of this construction is to enable the removal of the burner for inspection or repairs, without disturbing the heating tube. The top of the burner is provided at its ends with vertical flanges or lugs 21, preferably integral therewith.

The combustion chamber, or firebox is formed of a hollow casing 22, composed of a strong, refractory material, preferably, cast-iron. This casing is provided with preferably integral, inwardly projecting flanges or lugs 23, which hug the flanges 21, and rest on top of the burner, thereby supporting the casing. The bottom of the casing is left open, to permit the free access of air to the outside of the flame. The casing is also provided with openings or peep holes 24 closed by shutters 24^a and with lighting orifices 25, closed by shutters 25^a and is formed at its upper end with an annular shoulder and upstanding flange 26.

The casing 22 is surmounted by a flue or chimney 27, formed of sheet metal, such as iron or copper, which surrounds the flange 26, and rests upon the annular shoulder, and is thus supported in position. This flue is furnished with a cover 28, formed with a peripheral flange 29, whereby it is secured, and with a depending bracket 30, which is adapted to embrace the upper end of tube 4, and straddle the flange 5. This bracket constitutes a means for holding the flue in proper relation to the heating tube. The upper end of the flue, on the side next to the radiator, is cut away, as at 31, to make room for the coupling 3; and also to permit the escape of the products of combustion. I deem this feature an improvement over my prior patent, in that, with the present construction, the hot gases are discharged against the radiator, and thus aid in heating the circulating fluid.

The fuel enters the pipe 13, passes through the mixer 12, where it is mixed with a suitable proportion of air, as in the Bunsen burner, and the mixture then passes into the

chamber 10, and thence through the ports, or jet orifices 15. By virtue of the above described construction of the burner, the flame, on issuing from the orifices, receives an additional supply of air, and is directed against the sides of the tube, thus producing a very intense action. The hot gases pass upward along the tube, producing additional heating, and escape from the upper end of the flue, as above described.

By the arrangement described, I have provided a very simple, complete, and efficient heating apparatus, the utility and numerous advantages of which will be readily appreciated.

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

1. In combination with a portable hot fluid radiator, provided with an auxiliary fluid passage, having communication at its opposite ends with the radiator sections, a burner surrounding said auxiliary fluid passage, and having inclined ports or jet-orifices, directed toward said fluid passage, and lugs carried by said burner and bearing against said auxiliary fluid passage, whereby an air space is preserved between said parts.

2. In combination with a vertical fluid containing member of comparatively thin, flat, cross-section, a burner of substantial U-shape having flat, parallel legs embracing said member, the legs of said burner being held at their ends by a removable plate having a square shoulder projecting between the same, substantially as and for the purpose described.

3. The combination with a vertical, fluid containing chamber having a comparatively thin, flat, cross-section, of a horizontal, U-shaped burner the legs of which embrace said chamber, said burner comprising a hollow body portion and a removable lid or cover, such lid having a series of inwardly inclined jet orifices in each leg of the U, and means for preserving an air space between said burner and chamber.

4. The combination with a vertical fluid containing chamber of thin, flat, cross-section, of a horizontally disposed U-shaped burner surrounding said chamber, the legs of said burner being straight and parallel and formed with internally projecting lugs, whereby an air space is preserved between such legs and the flat walls of said chamber.

5. In combination with a portable hot fluid radiator, a heating tube connected at its ends with said radiator, a burner embracing said tube, and a fire-box surrounding said burner and provided with internally projecting flanges resting on said burner, by means of which said fire-box is supported.

6. In a hot water heating apparatus, in combination, a radiator, a heating tube hav-

ing its ends connected therewith, a burner arranged to heat said tube, said burner comprising a body portion, and a top member or cover, containing the jet orifices, and provided at each end with upstanding lugs, and a firebox surrounding said burner and provided with internally projecting lugs adapted to hug the corresponding lugs on said top member.

7. The combination with a substantially vertical fluid containing member of a burner embracing said member, a fire-box of heat resisting material surrounding the burner and lower end of said member, and a detachable flue of light material supported by said firebox and surrounding the upper part of said member.

8. In combination with a hot-fluid radiator provided with a vertically disposed heating tube connected at its ends, by suitable couplings, with the radiator, a flue surrounding said tube, said flue being cut away to receive the upper coupling, and to permit of the discharge of the products of combustion around and below the coupling and against the radiator, whereby the heating effect is increased.

9. In combination with a portable hot-water radiator, a vertically-disposed heating-tube having communication with the fluid-passages of the radiator and com-

prising walls which, as compared with the walls of the columns of the radiator proper, are closely associated to compel the fluid to pass therethrough in a thin film, a burner combined with and surrounding said heating-tube at the lower portion thereof, said burner being formed with inwardly directed jet orifices, and with internally projecting lugs bearing against the heating tube, whereby the flame is caused to impinge upon the walls of said heating tube, and a current of air supplied to the inside of said flame.

10. The combination with a substantially vertical fluid containing chamber of elongated cross-section, of a horizontal, U-shaped burner, the legs of which embrace said chamber, said burner comprising a hollow body portion, and a removable lid or cover, containing a row of jet orifices on both sides of said chamber, both said body portion and cover being provided with lugs abutting said chamber, whereby an air space is preserved between the legs of said burner and the walls of said chamber.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY T. OFFTERDINGER.

Witnesses:

GEO. W. REA,

GERTRUDE M. STUCKER.