

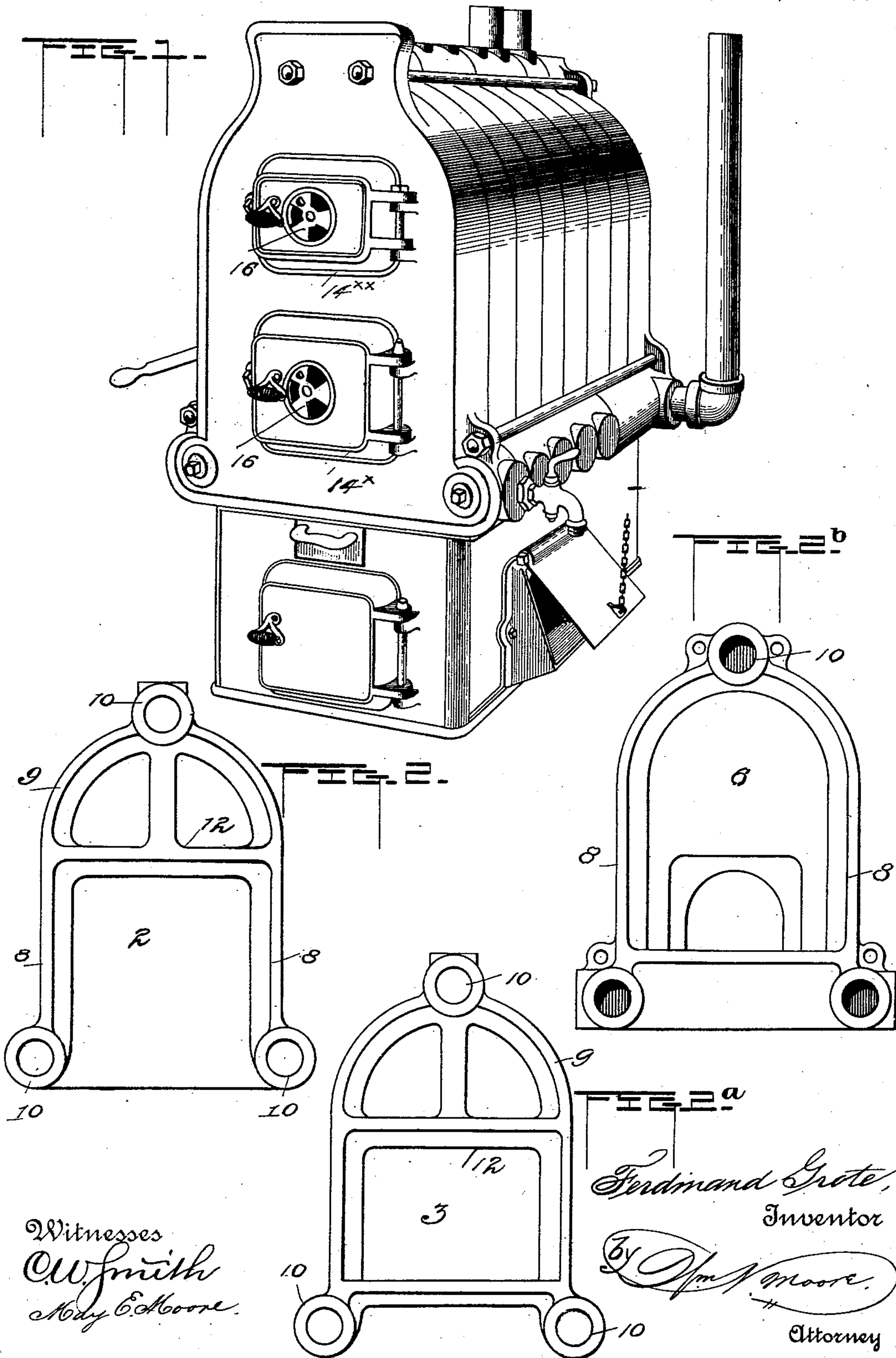
(No Model.)

2 Sheets—Sheet 1.

F. GROTE.
SECTIONAL BOILER.

No. 572,005

Patented Nov. 24, 1896.



Witnesses
C. W. Smith
May E. Moore.

Ferdinand Grote,
Inventor

By J. M. Moore.
Attorney

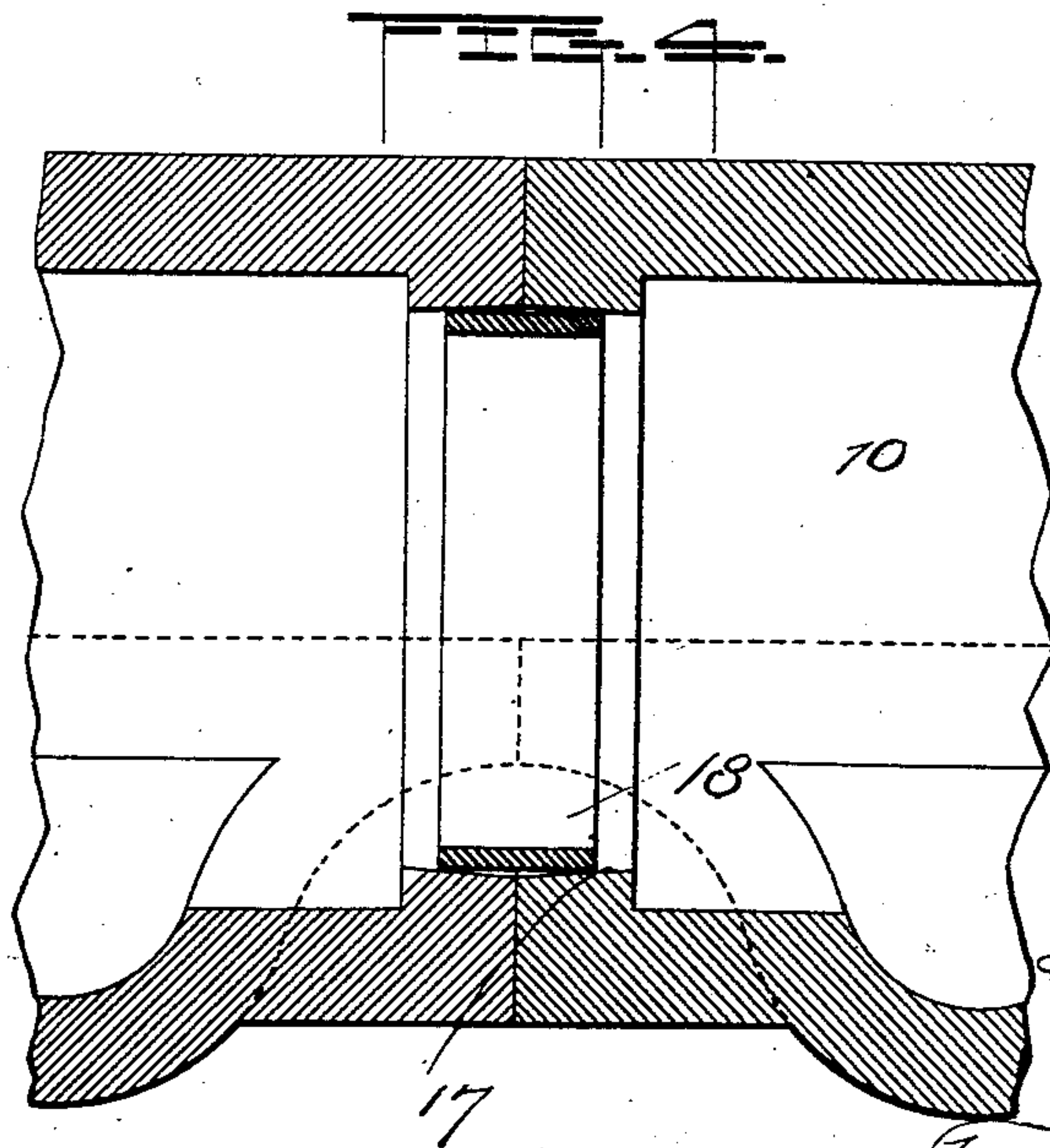
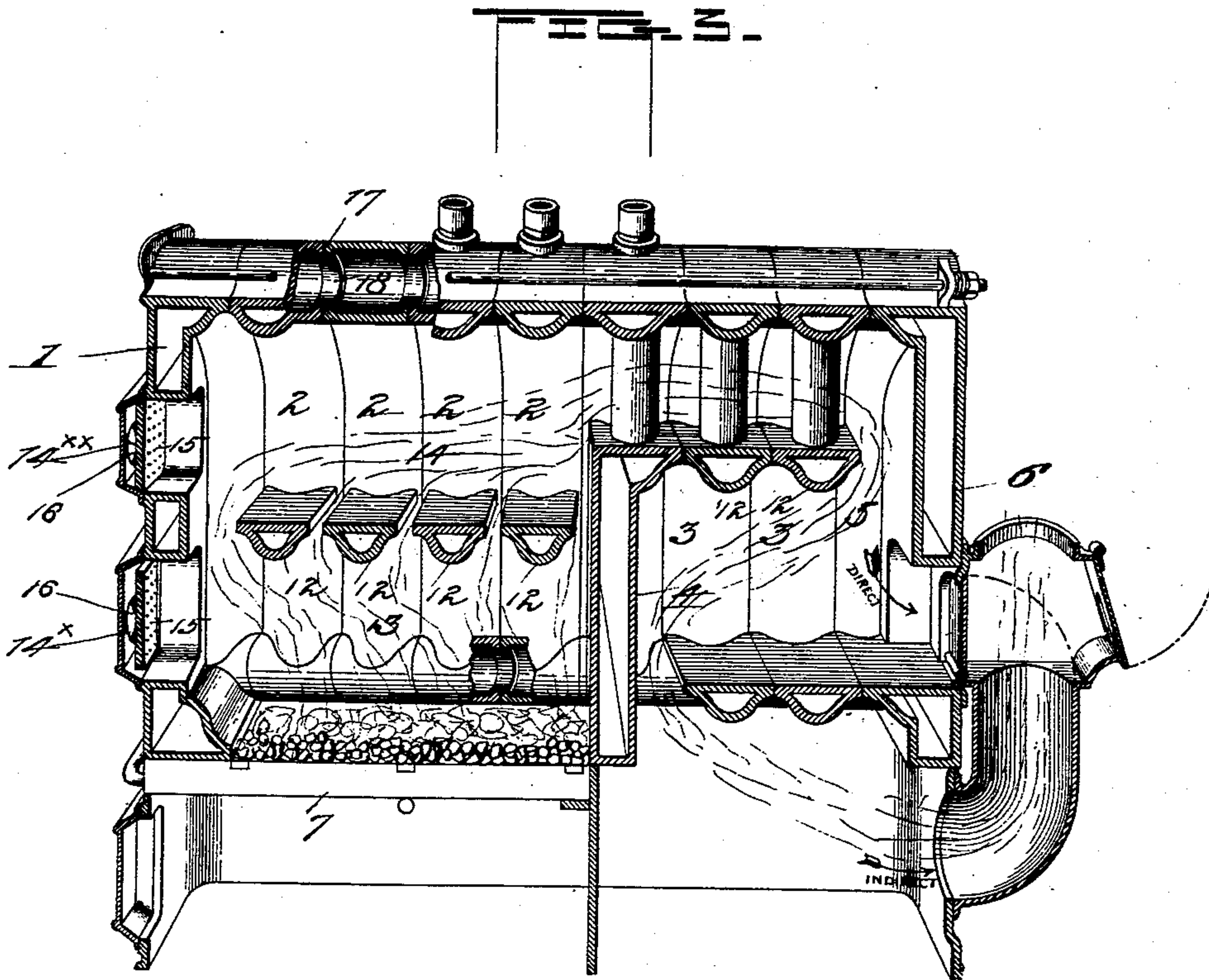
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UNITED STATES PATENT OFFICE.

FERDINAND GROTE, OF EVANSVILLE, INDIANA.

SECTIONAL BOILER.

SPECIFICATION forming part of Letters Patent No. 572,005, dated November 24, 1896.

Application filed July 23, 1896. Serial No. 600,234. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND GROTE, a citizen of the United States, residing at Evansville, in the county of Vanderburg and State of Indiana, have invented certain new and useful Improvements in Sectional Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to sectional water-boilers of that class or description for which Letters Patent of the United States were granted to me February 27, 1894, No. 515,584, in which the boiler is composed of a number of hollow water-sections connected together so as to form an interior fire-box and combustion-chamber. The object of the present invention is to provide an improved construction of the same in which the front sections are provided with transverse hollow water-bars communicating therewith and located above the grate, forming a combustion-chamber and fire-box, spaces being left between the adjoining water-bars, whereby the heat from the fire-box will escape and spread into the combustion-chamber above. By this construction all the smoke and gases will be completely consumed, which will effect a great saving in fuel. It is also an object to provide an improved connection between the said sections, whereby a perfectly tight joint is produced in a simple manner.

The invention consists in the novel construction and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a sectional boiler embodying my invention. Figs. 2, 2^a, and 2^b are front views of the sections. Fig. 3 is a horizontal sectional view of a water-boiler constructed in accordance with my invention. Fig. 4 is a detail sectional view showing the joint or connection between the sections.

In the said drawings the reference-numeral 1 designates the front section of the boiler; 2 2, the fire-box sections; 3, the sections constructed to form the bridge-wall 4; 5, the return-flue section, and 6 the back or rear section, all of which are fitted and bolted laterally together, so that the flame and water-

spaces thereof are brought into proper alignment to form a complete boiler.

I may employ a series of two, three, or more of the sections 2 to form the fire-box and combustion-chamber above the grate 7, the sections 2 being of the form shown in Fig. 2. By reference to this figure it will be seen that the section 2 is cast in a single piece of metal with the water-legs 8, the arched top or crown 9, the joints 10, and the transverse hollow water-bars 12, flat on their upper sides and curved or rounded on their under sides and somewhat smaller in width than the said sections, so that when the latter are put together and connected there will be horizontal openings between the upper sides of said bars and flaring spaces beneath the same. These bars separate the space in the front of the boiler into a fire-box 13 and a combustion-chamber 14 above.

The front section 1 of the boiler is provided with two hollow doors 14^x and 14^{xx}, one above the other, opening into the fire-box and combustion-chamber, respectively, and the inner walls thereof are provided with openings 15 and the outer walls with a damper 16 for the purpose of admitting air to the fire-box and combustion-chamber. The air supply may be regulated or cut off entirely by means of the dampers when desired. The joints 17 in the said sections are made tapering or conical, (see Fig. 4,) being somewhat larger at the outer than at the inner ends, and engaging therewith are cylindrical rings 18, the peripheries of which are perfectly true, so that when inserted in the openings their central portions do not contact with the abutting ends of the joints. By this construction when the sections are drawn together by the connecting-rods the said rings will spread or be forced against the tapering sides of the openings, making a perfectly tight joint.

The return-flue sections 4 and the back section 5 are identical in construction with those described and shown in my aforesaid patent, and a detail description thereof is not deemed necessary.

The operation will be readily understood. Fire is made on the grate as usual and the smoke and gases will pass to the combustion-chamber above, where they will be ignited by the heat escaping through the openings be-

tween the hollow water-bars and be thereby entirely consumed. The said bars thus serve a double purpose—namely, they separate the fire-box from the combustion-chamber and
5 also aid in heating the water. The hollow doors supply the requisite air to the fire-box and combustion-chamber, thus insuring complete combustion of the smoke and other unconsumed products of combustion from the
10 fire-box, consequently effecting great economy in fuel.

The joints and rings for connecting the sections may be used in connection with any description of sectional boiler where it is desired to make a tight and perfect connection.
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I claim—

1. The sectional boiler herein shown and described, consisting of the ash-pit, the soot-chamber adjacent thereto having an outlet
20 provided with a damper, the grate above the ash-pit consisting of a series of sections, the

transverse water-legs dividing the furnace into a fire-box and combustion-chamber, doors for said fire-box and combustion-chamber, and the joints connecting the sections of
25 the boiler and consisting of flanged ends and bands or collars.

2. The sectional boiler herein described, consisting of a series of hollow sections, the tubular joints connecting the sections at the
30 tops and sides, each joint consisting of the short tubes having their ends abutting and formed with inward-inclined flanges providing a conical seat and short tubes fitting in the seats and held firmly against the inclined
35 walls of the flanges.

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

FERDINAND GROTE.

Witnesses:

WM. HARTMAN,

SAML. W. MILLER.