

No. 733,923.

PATENTED JULY 14, 1903.

W. R. THOMAS.
HOT WATER FURNACE.

APPLICATION FILED OCT. 14, 1901. RENEWED MAY 23, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

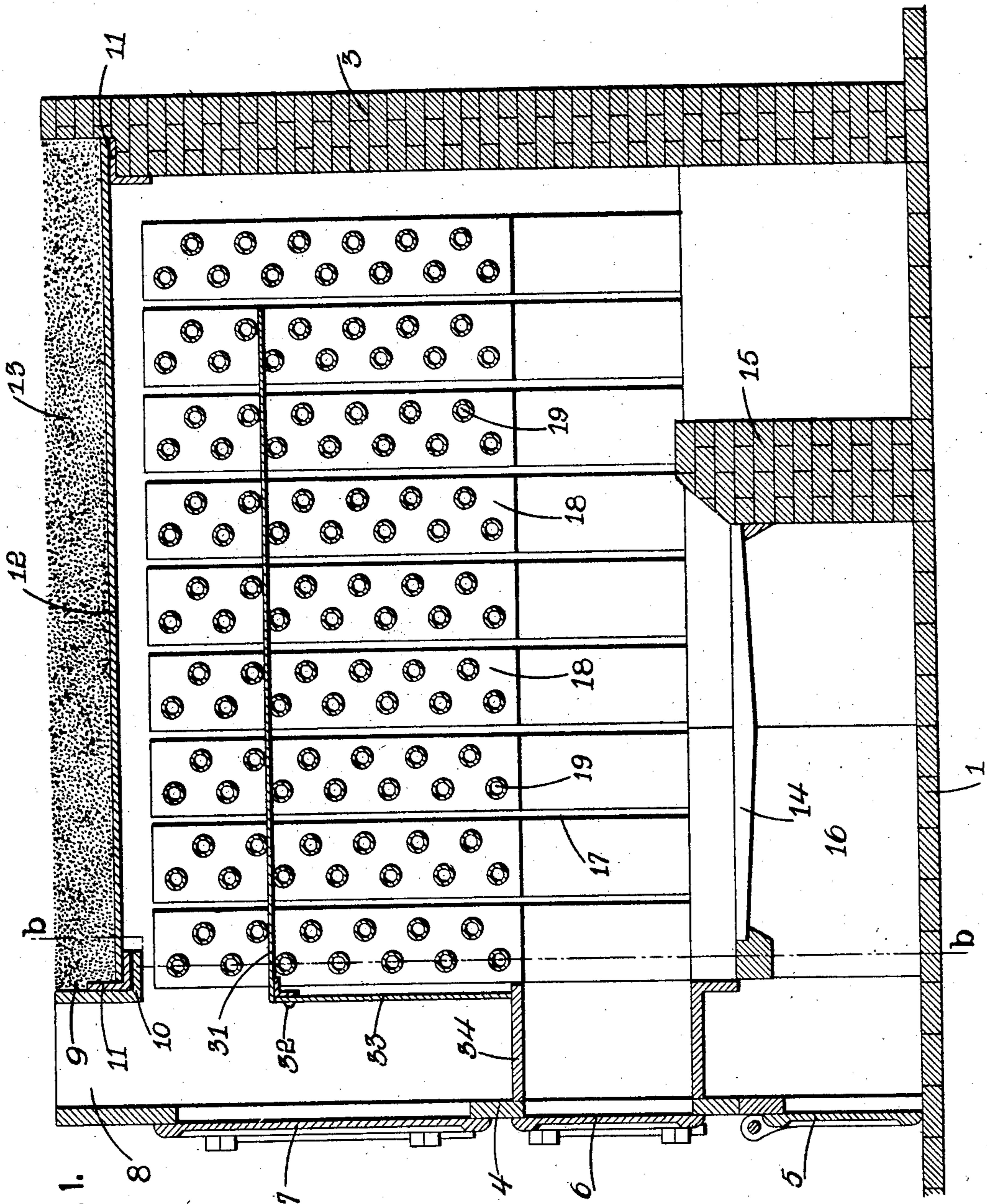


Fig. 1.

Witnesses.

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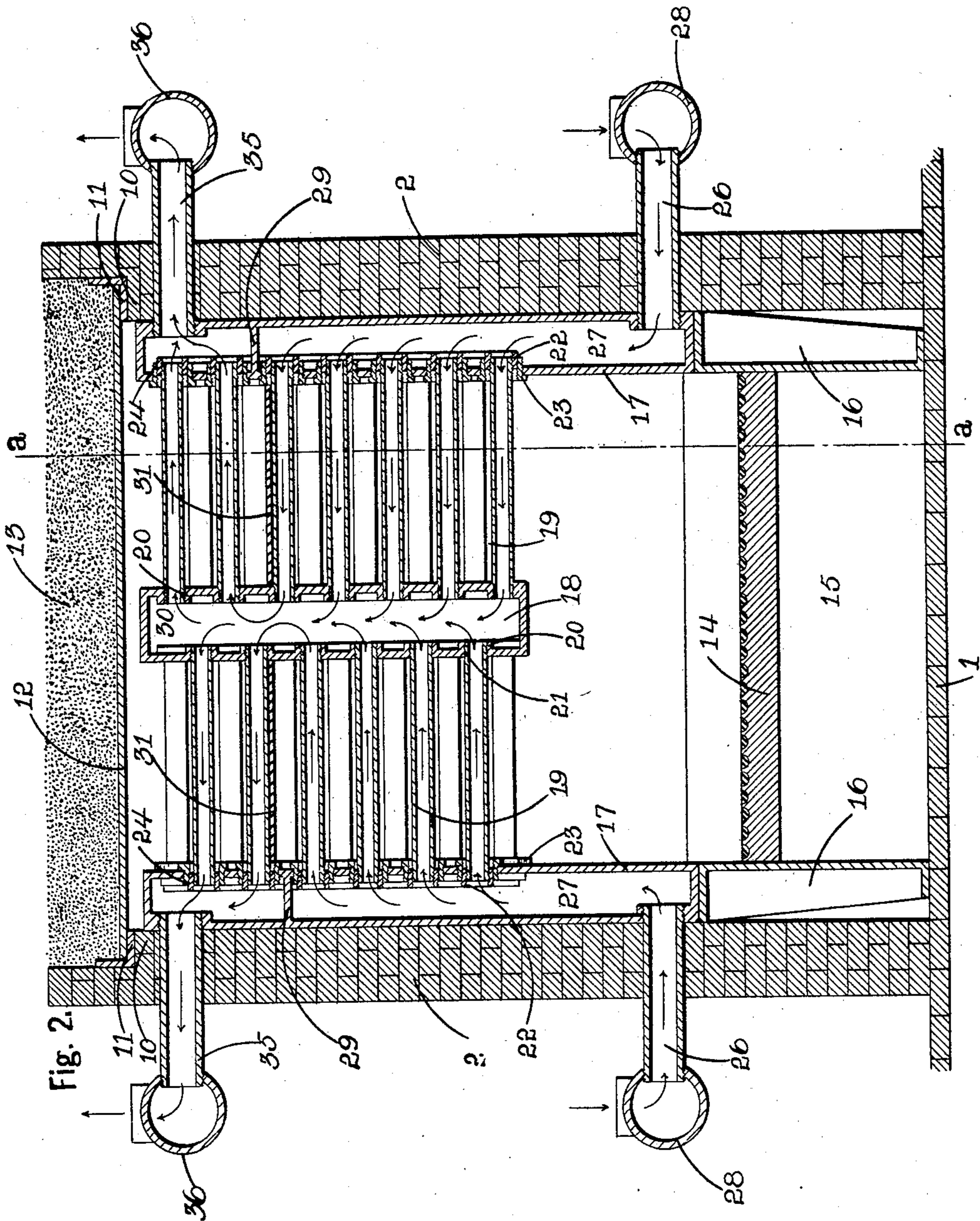
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3 SHEETS—SHEET 2.



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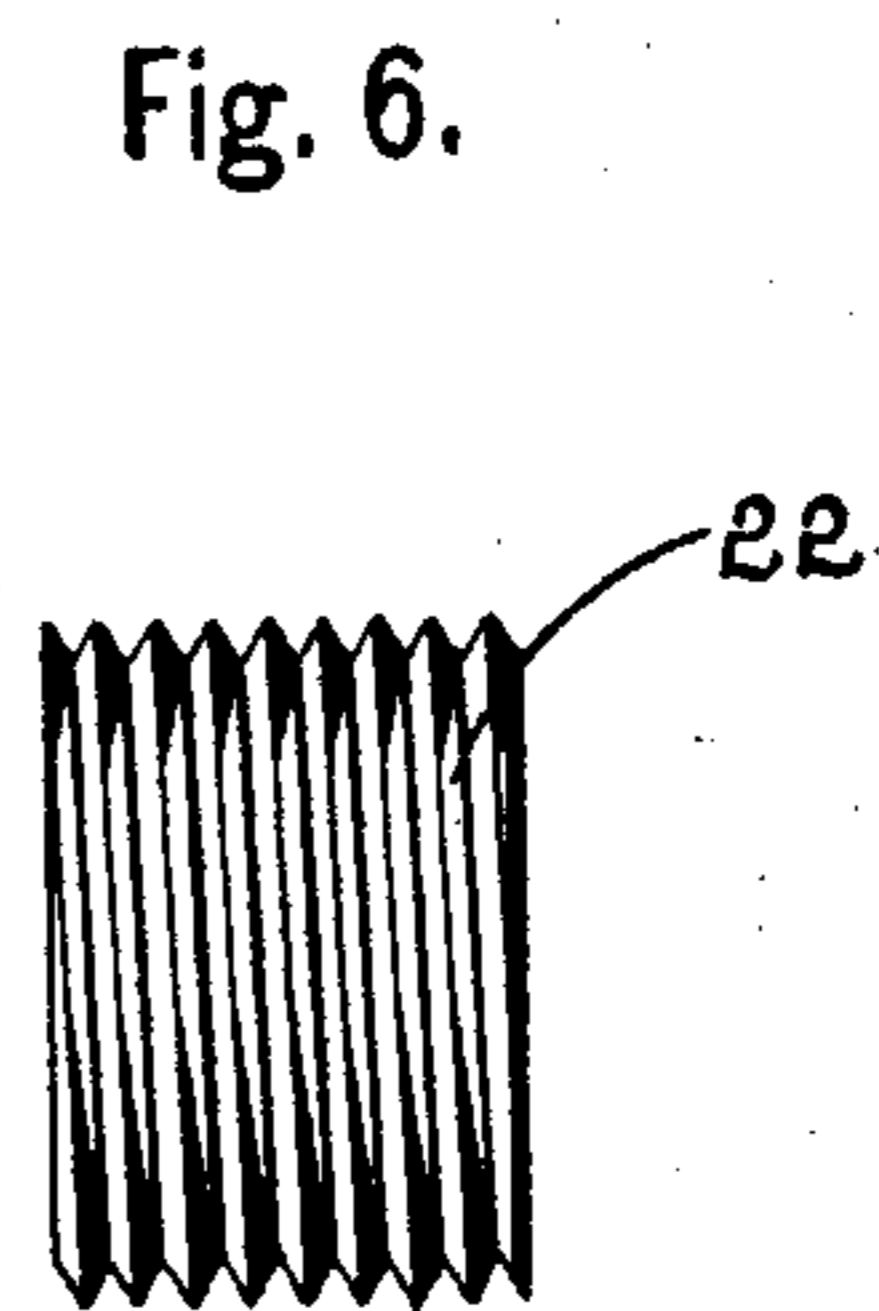
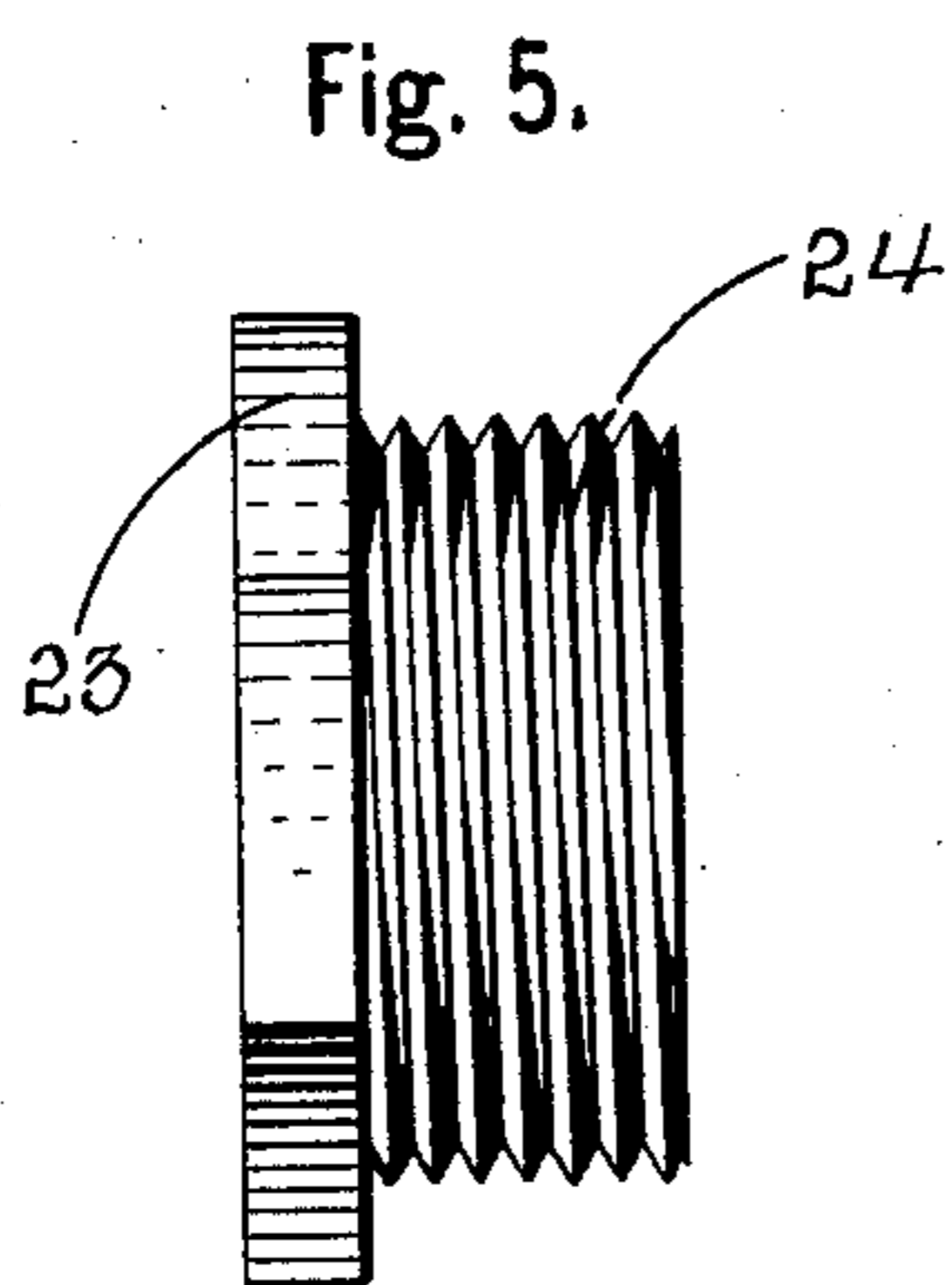
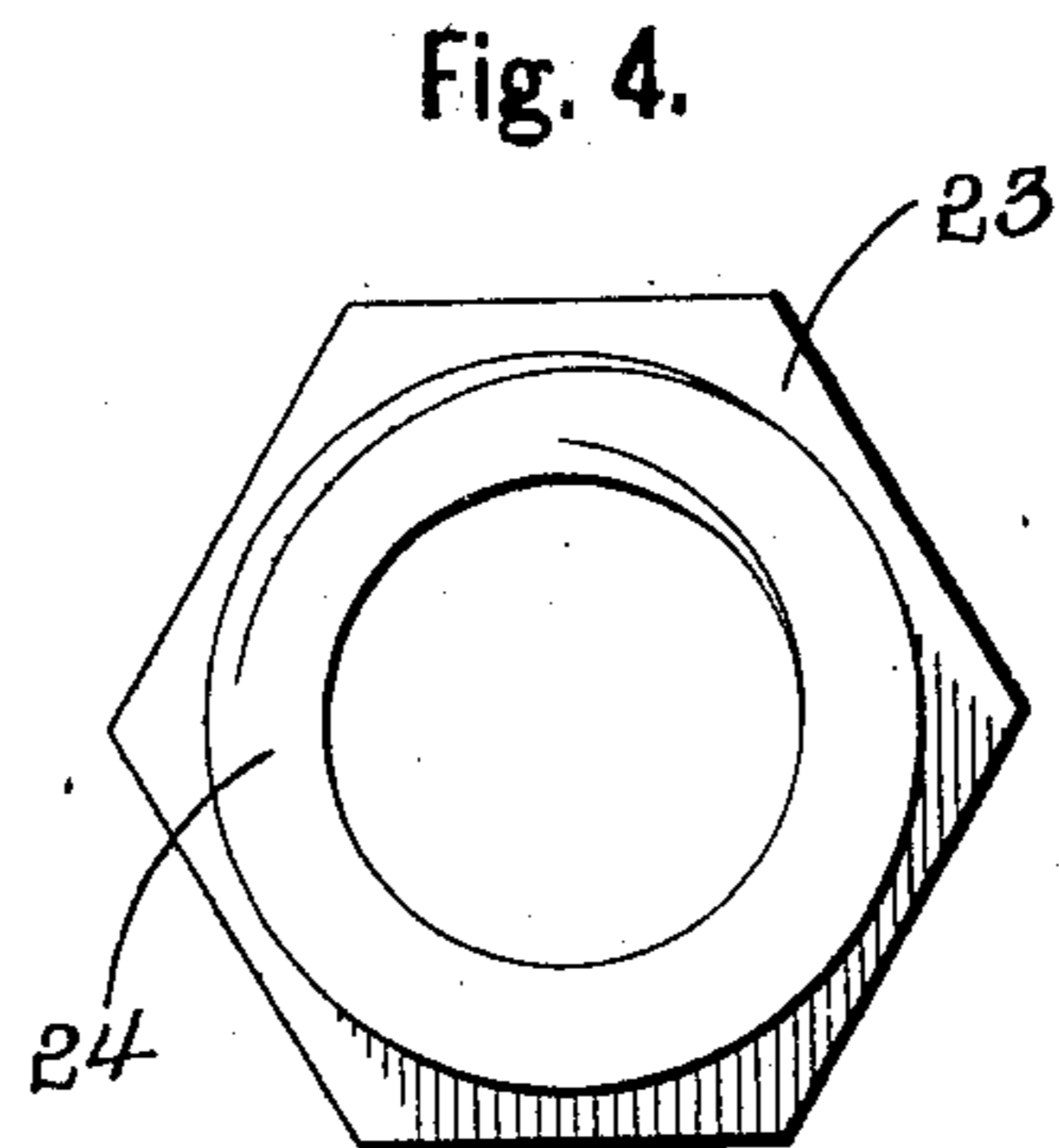
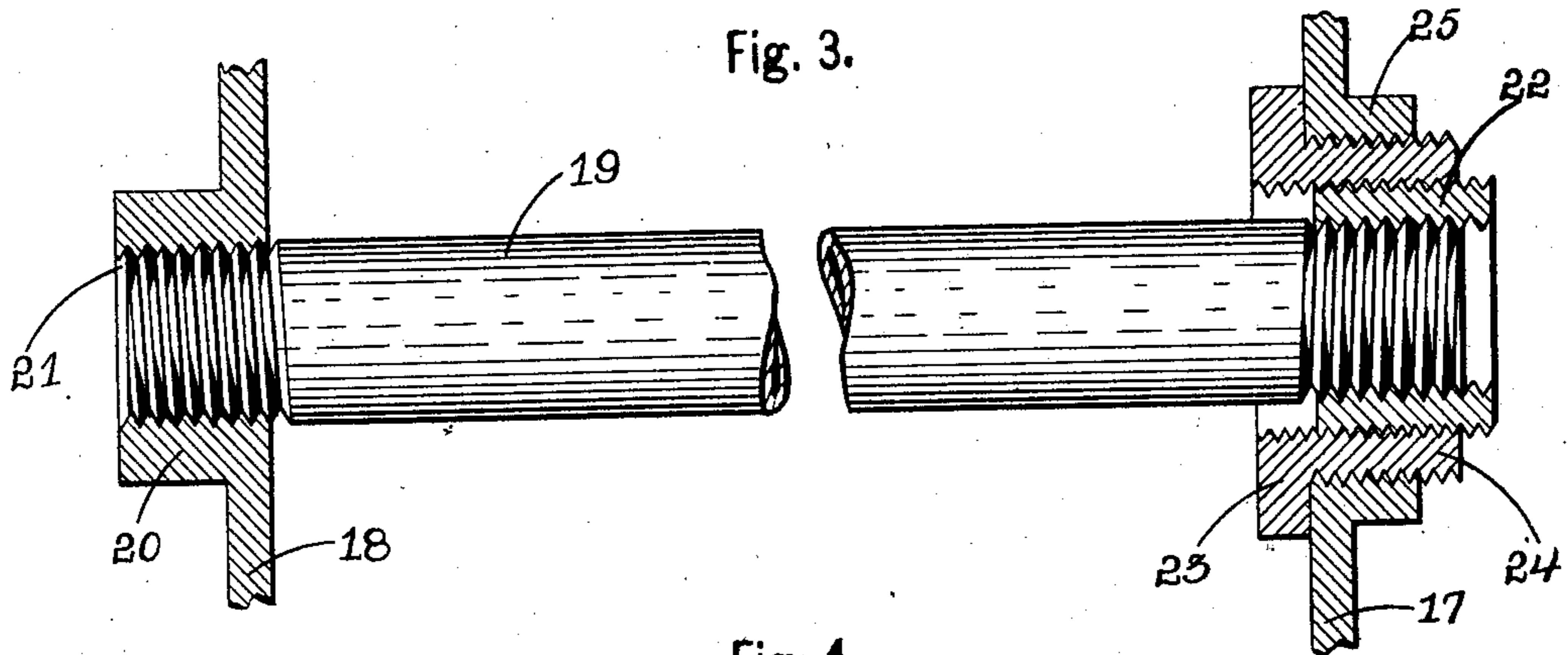
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NO MODEL.

3 SHEETS—SHEET 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM R. THOMAS, OF BUFFALO, NEW YORK.

HOT-WATER FURNACE.

SPECIFICATION forming part of Letters Patent No. 733,923, dated July 14, 1903.

Application filed October 14, 1901. Renewed May 23, 1903. Serial No. 158,542. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. THOMAS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Hot-Water Furnaces, of which the following is a specification.

This invention relates to an improved boiler composed of a series of independent sections or frames each having hollow side members, a hollow middle member, and pipes connecting said hollow side members and middle members; and the objects of the invention are to provide for the quick and economical heating of water and to enable the sections or frames of the boiler to be removed from the furnace for repair or replacement.

The invention further relates to certain details of construction, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section on line *a a*, Fig. 2. Fig. 2 is a vertical transverse section on line *b b*, Fig. 1. Fig. 3 is an enlarged fragmentary view of one of the flues or pipes, together with fragmentary sections through the walls of its support and its coupling. Fig. 4 is a detached face view of the lock-nut. Fig. 5 is a detached side elevation of the lock-nut. Fig. 6 is a detached side elevation of the screw-threaded sleeve.

In referring to the drawings for the details of construction like numerals designate like parts.

The furnace employed in connection with my improved boiler is provided with a bottom or foundation 1, side walls 2, and rear wall 3, all preferably of fire-brick.

The front 4 of the furnace is preferably of cast-iron and has a lower door 5 for the removal of ashes, an intermediate door 6 for the introduction of fuel, and an upper door 7, through which a deflecting plate or plates can be removed, as will be more clearly hereinafter described and claimed.

The furnace has a removable top which can be taken off when it is desired to obtain access to or remove the flues or pipes and their supports. The vertical flue 8, which leads to the chimney, is arranged at the front of the furnace, and the side and rear walls

2 and 3 and the wall 9, which forms the rear wall of the flue 8, are recessed or cut away to leave shoulders 10, upon which angle-irons 11 are supported. The iron plate 12, constituting the furnace-top, is mounted upon the angle-irons and is covered with a layer of sand 13 or other suitable material.

The interior of the furnace is provided with a grate 14 and a bridge-wall 15. The boiler is composed of a series of independent sections or frames each having two hollow iron frame members, each of which is mounted upon one of the side supports 16 of the grate and extends vertically upward and parallel and in contact with the inner surface of the side walls 2 of the furnace, and a middle vertical hollow frame member or partition 18, which is supported between the pair of side frame members 17 by a plurality of horizontal pipes 19, which are screwed or otherwise detachably secured in the side and middle frame members. The middle frame members do not extend down to the grate, terminating at a suitable distance above the same, and are supported solely from the side members by the connecting-pipe 19. By this means the combustion-chamber of the furnace is not partitioned or divided. The middle frame members or partitions 18 each have a plurality of flanged portions 20, provided with screw-threaded openings 21, in which the screw-threaded inner extremes of the pipes screw, and an externally and internally screw-threaded sleeve 22 is fitted upon the outer screw-threaded extremes of the pipes, (see Fig. 3,) the screw-thread at one extreme of the pipe running oppositely to the screw-thread at the opposite extreme. The pipes are locked in place by lock-nuts 23, each of which have a reduced screw-threaded portion 24, adapted to screw into place between one of the sleeves 22 and one of the internally-screw-threaded flanged parts 25 of the inner wall of the vertical side members 17.

A series of water conducting or inlet pipes 26 pass through the side walls 2 of the furnace and screw into flanged openings in the outer walls of the vertical hollow side members at or near the lower end thereof. One of these pipes connects with each vertical water-chamber 27 in the wall of the vertical side members 17. The outer ends of the

pipes 26 are connected to suitable conducting-pipes 28, which extend to and conduct the water from the radiating system to the furnace. The vertical water-chambers 27
 5 are each divided by a horizontal transverse wall 29, which prevents the water ascending throughout the length of the chamber 27 and forces it to pass through the pipes 19 into the water-chamber 30 in the middle frame
 10 member or partition 18, thereby causing the water to follow a circuitous route and more thoroughly exposing it to the heat of the furnace.

To prevent the heat and the products of
 15 combustion passing directly to the chimney-flue 8, horizontal deflecting-plates 31 are arranged and supported between the pipes 19, substantially as shown in Figs. 1 and 2. These plates are detachably secured at their
 20 front ends by bolts or screws 32 to vertical plates 35, the lower ends of which rest on a horizontal support 34, extending from the furnace-frame. By this means the heat is more thoroughly diffused in the furnace.
 25 The heated water passes from the boiler out through the pipes 35, which pass through the side walls 2 and screw into the outer walls of the side members of the frames at or near the top of said side members, and the pipes
 30 36 and their connections to the radiators.

It will be noted that the boiler is composed of a series of independent sections or frames each having hollow side members, a hollow middle member, and a plurality of conducting-
 35 pipes connecting said side member and middle member, which can be easily removed from the furnace for repair or replacement by detaching the plate 31 from the vertical plate 38 and removing both plates through
 40 the opening closed by the upper door 7, unscrewing the pipes 26 and 35 from the side walls of the frames, removing the sand 13 and top plate 12, and lifting the iron frame or frames out.

45 If any of the pipes 19 require removing, they are easily taken out by unscrewing the lock-nut and then unscrewing them from the side and middle members of the frame.

The course followed by the water in passing through the furnace is shown by arrows 50 in Fig. 2.

The principal advantages of the invention reside in the simple construction and the ease of removal and replacement of the interior parts and the arrangement of the heating-
 55 flues, so that the water is quickly heated.

I claim as my invention—

1. A boiler comprising a plurality of independent sections, each having hollow vertical side members forming side water-chambers, 60 a hollow vertical middle member forming a middle water-chamber and a plurality of horizontal pipes connecting said side members and middle member; said middle member being supported solely from the side mem- 65 bers and said side members being divided by an intermediate horizontal wall to prevent the water ascending throughout the length of their water-chambers, substantially as set forth. 70

2. A boiler comprising a plurality of independent sections, each having hollow vertical side members, a hollow vertical middle member, a plurality of horizontal pipes connecting said member, a horizontal heat-deflecting 75 plate arranged and supported between said horizontal pipes, and a vertical plate secured to the front extreme of the horizontal deflecting-plate and extending in front of the horizontal pipes, substantially as set forth. 80

3. A boiler comprising a plurality of independent sections, each having side members and a middle member provided with water-chambers, horizontal pipes connecting said members and the water-chambers thereof, 85 inlet and outlet pipes connecting to near the bottom and top respectively of said side members and a dividing-wall in the water-chambers of the side members intermediate the inlet and outlet connections, substantially as set forth. 90

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Witnesses:

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