

Feb. 14, 1933.

G. ANDERSON

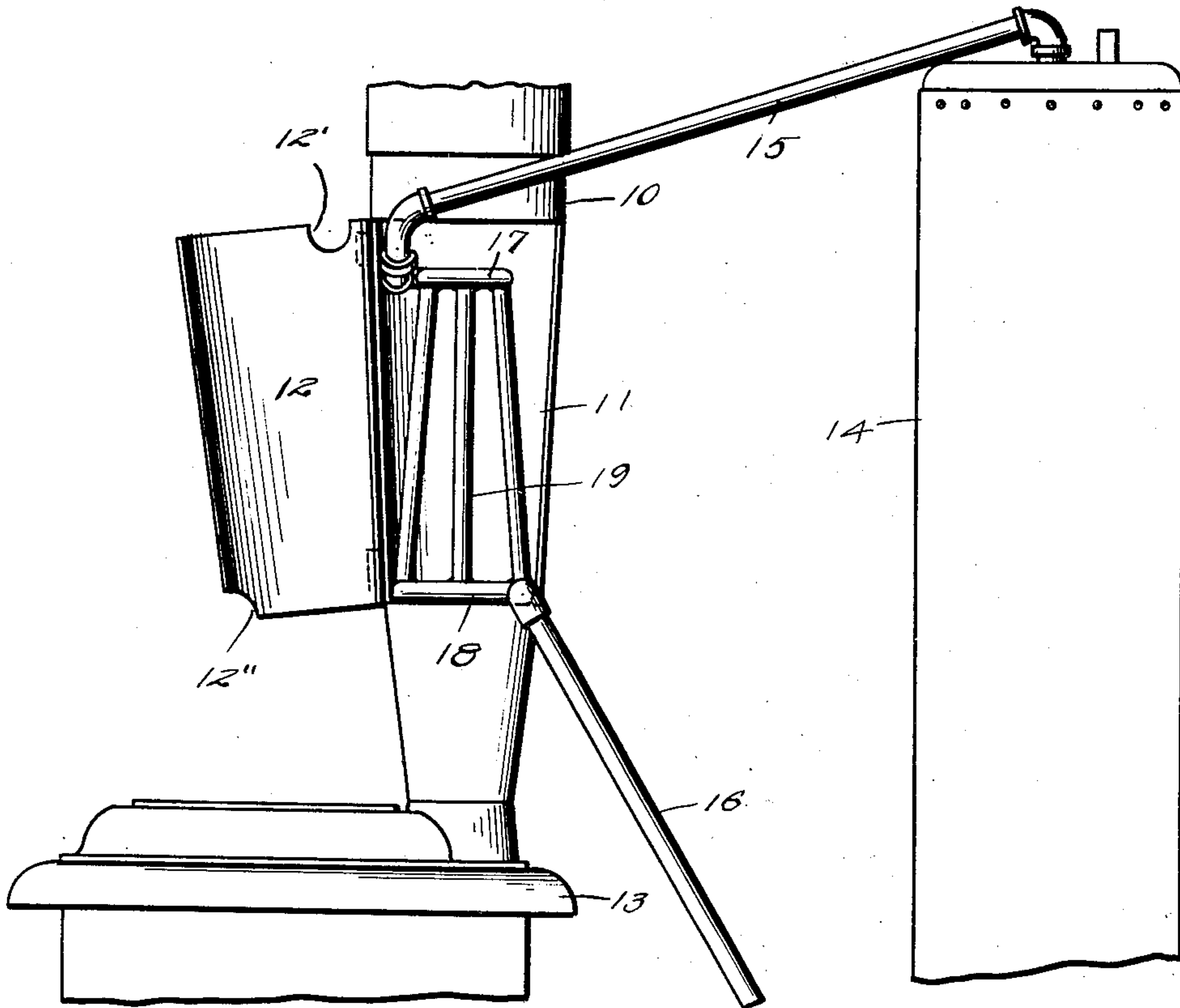
1,897,413

WATER HEATER

Filed March 12, 1932

2 Sheets-Sheet 1

Fig. 1.



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FIG. 2.

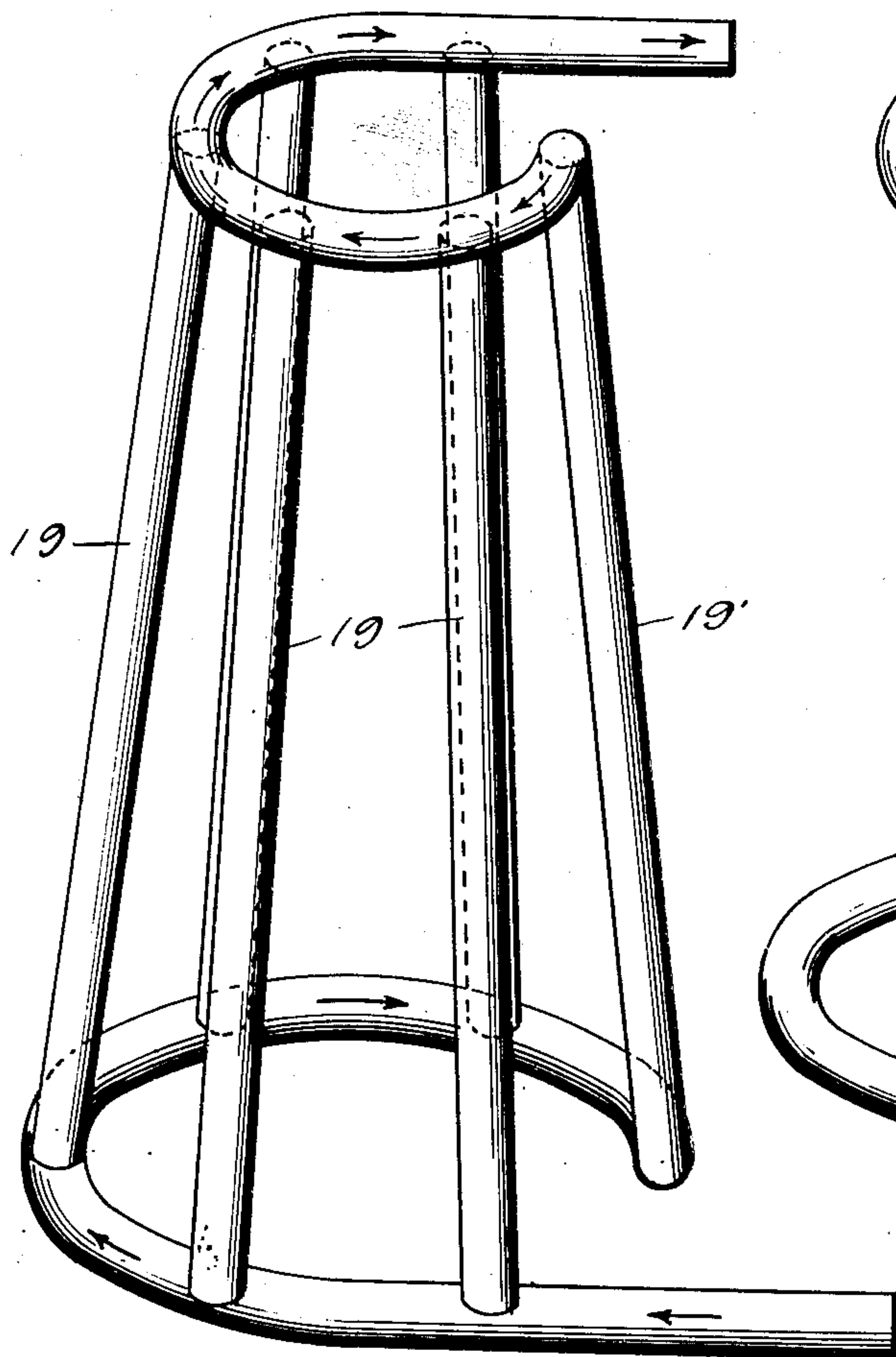
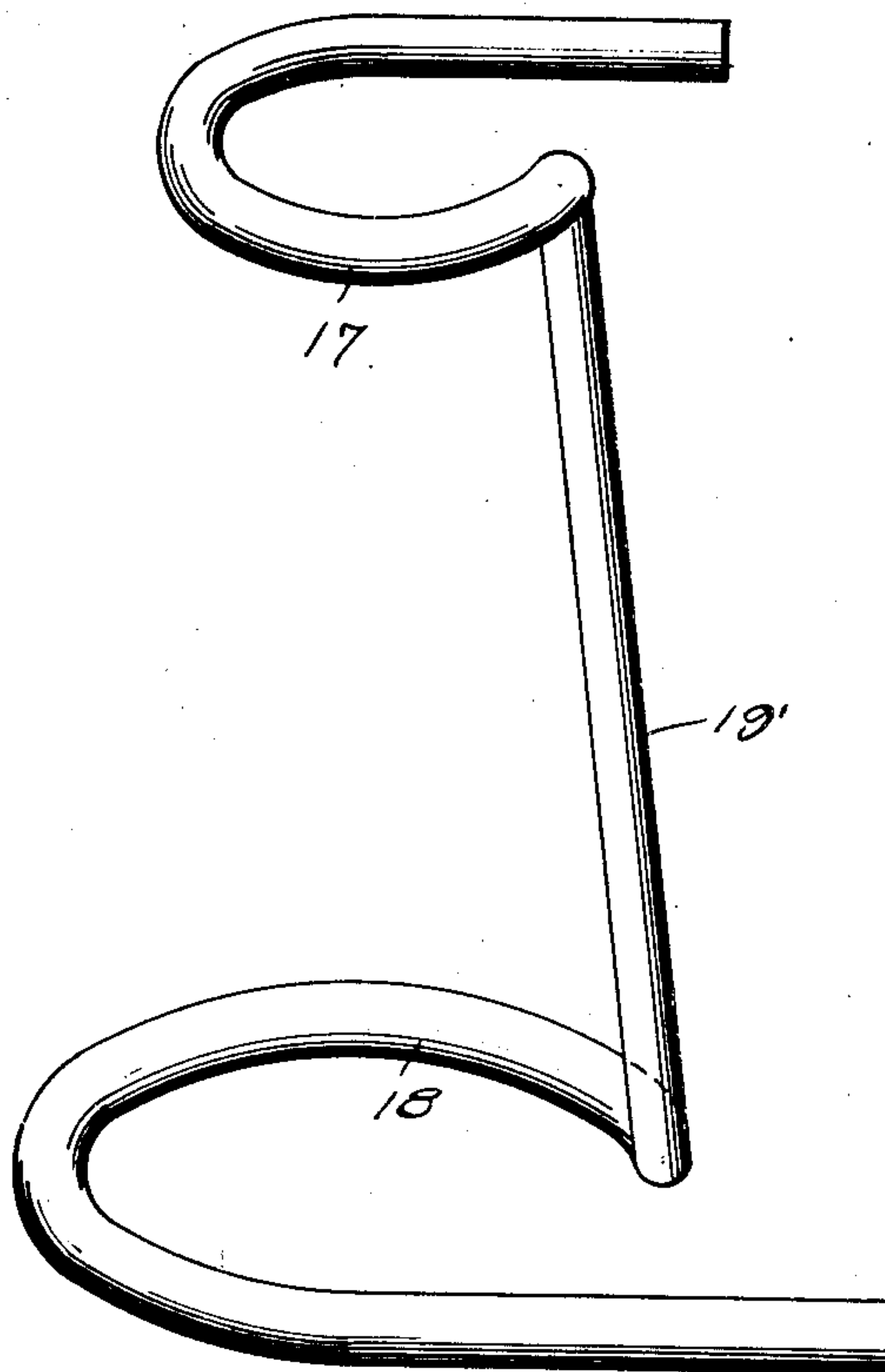


FIG. 3.



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UNITED STATES PATENT OFFICE

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WATER HEATER

Application filed March 12, 1932. Serial No. 598,451.

The object of this invention is to provide a water heater of the type intended to be installed in a smoke pipe of a stove, but which may be installed in any flue where a current of heated air is flowing or where products of combustion are moving toward a chimney or other smoke discharge element.

A further object is to provide a cage-like structure formed of tubular material and including elements which pass across or partly across the line of draft and are subject to a maximum degree of heat, without any important obstruction to the draft, and without making it difficult to clean the tubes.

A further object is to provide for the use of a somewhat unusual "frame" which determines the contour of the complete device, so that the work of assembly is reduced, and no error can readily be made, assuming that fluid-tight connections are effected at a minimum number of joints, compared with the number which would be needed under usual conditions.

With the foregoing and other objects in view, the invention consists in the novel arrangement of elements disclosed and in the type of certain of the individual elements,—it being understood that changes or alterations may be made within the scope of the appended claims.

In the accompanying drawings,

Figure 1 is a view in elevation, showing the water-heating element within a stove-pipe, and as having connection with a boiler or tank.

Figure 2 shows the heating element in perspective, and detached from the pipe of the stove and from the boiler or tank; and Figure 3 shows one element of the structure of Figure 2; both views illustrating a form of the device in which the upper and lower manifolds and one upwardly extending tube are formed integrally.

The stove pipe 10 is provided with an opening 11, adapted to be closed by a hinged door 12, but as this portion of the construction is incidental to the main features of the invention, the elements are to be considered as conventional disclosures, and the same

comment applies to the stove, the top of which is designated 13.

A boiler or water tank 14 has connected with the upper portion thereof an upper pipe 15, and a pipe 16 is to be placed in communication with the tank at a suitable point, or with a source of supply. The pipes 15 and 16 are in communication with the upper and lower manifolds 17 and 18 respectively, the connections being effected in any suitable manner, and the door 12 is cut away at 12' and 12'' so that it may be closed around the pipe connections.

Manifolds 17 and 18 are to be provided with a series of apertures, and upwardly extending inclined tubes 19 are secured by welding or otherwise to the manifolds at such points that the bores of the tubes will register with the apertures.

I prefer to make the upper manifold 17 of such size or diameter, compared with manifold 18, that the several upwardly extending tubes will be inclined, and the complete cage-like structure will approximate a cone or frustum of a cone, and the tubes just mentioned will extend partly across the path of the products of combustion, thus promoting the heating effect desired.

The cleaning of the upper manifold 17 and all of the upwardly extending tubes is also more easily effected in view of the spacing shown in Figure 1 between the smoke pipe and the cage. The necessity of keeping the tubes clean is well known. In the view last referred to, a cleaning element tends to wedge slightly on the down stroke, in the outer space, and in Figure 2 the same element moving upwardly between the tubes will act in the same manner, and increase frictional contact with the metal. Certain portions of spiral coils, frequently employed, are nearly inaccessible.

In connection with the production of this device in quantities, the special frame element of Figure 3, and elsewhere, serves an important purpose, as it determines the contour of the cage and includes three important members thereof, designated for convenience 17, 18, 19'. One piece of tubing is employed,

and the upper and lower loop or ring-like portions are to be apertured for the accommodation of the tubes (any number of tubes) to be used in completing the cage. The manifold 5 folds may be considered as tubular split rings, reversely arranged, or deflected in opposite directions from the upwardly extending portion of the unit, thereby forming a balanced construction.

10 The water enters the lower manifold, rises in the upwardly extending tubes, and passes through the upper manifold to pipe 15, and thence to the tank 14.

A lower section of stovepipe, suitably proportioned, may be sold with the "coil", in order that the door and doorway may be of proper size, and as the pipes are approximately rigid when installed, no separate support for the coil referred to is usually required. 20

The water tends to rise in the heater as the temperature increases, and the resulting pressure is increased owing to the reduced capacity of the upper portion, represented 25 by manifold 17. Effective circulation, with sufficient time for heating, is clearly a direct advantage.

What I claim is—

1. In a water heater, an upper manifold, 30 a lower manifold of greater dimensions, and tubular elements having their end portions in communication with said manifolds, the manifolds providing ducts extending circumferentially, and comprising deflected portions 35 of one continuous tube.

2. A continuous tubular frame unit for a water heating device, comprising spaced upper and lower elements each approximating the form of a split ring, and a connecting 40 element constituting with the upper and lower elements a single duct.

3. A structure comprising the unit of claim 4, and including a series of tubes in communication with the upper and lower elements 45 of the frame and inclined toward said connecting element.

4. A structure comprising the unit of claim 2, in which said elements first named are deflected in opposite directions from the connecting element of the unit. 50

In testimony whereof, I have affixed my signature.

GUST ANDERSON.

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