

No. 661,477.

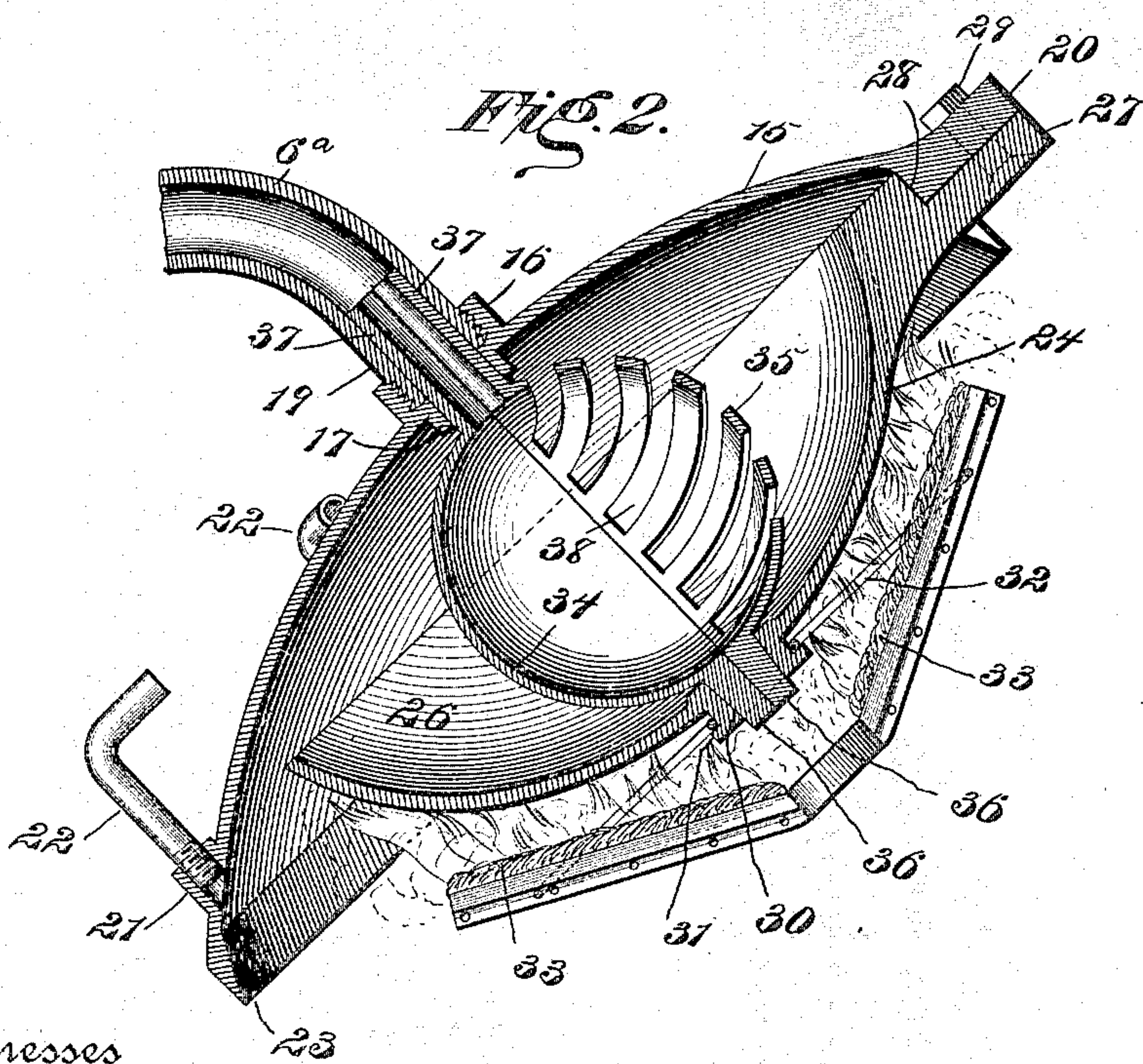
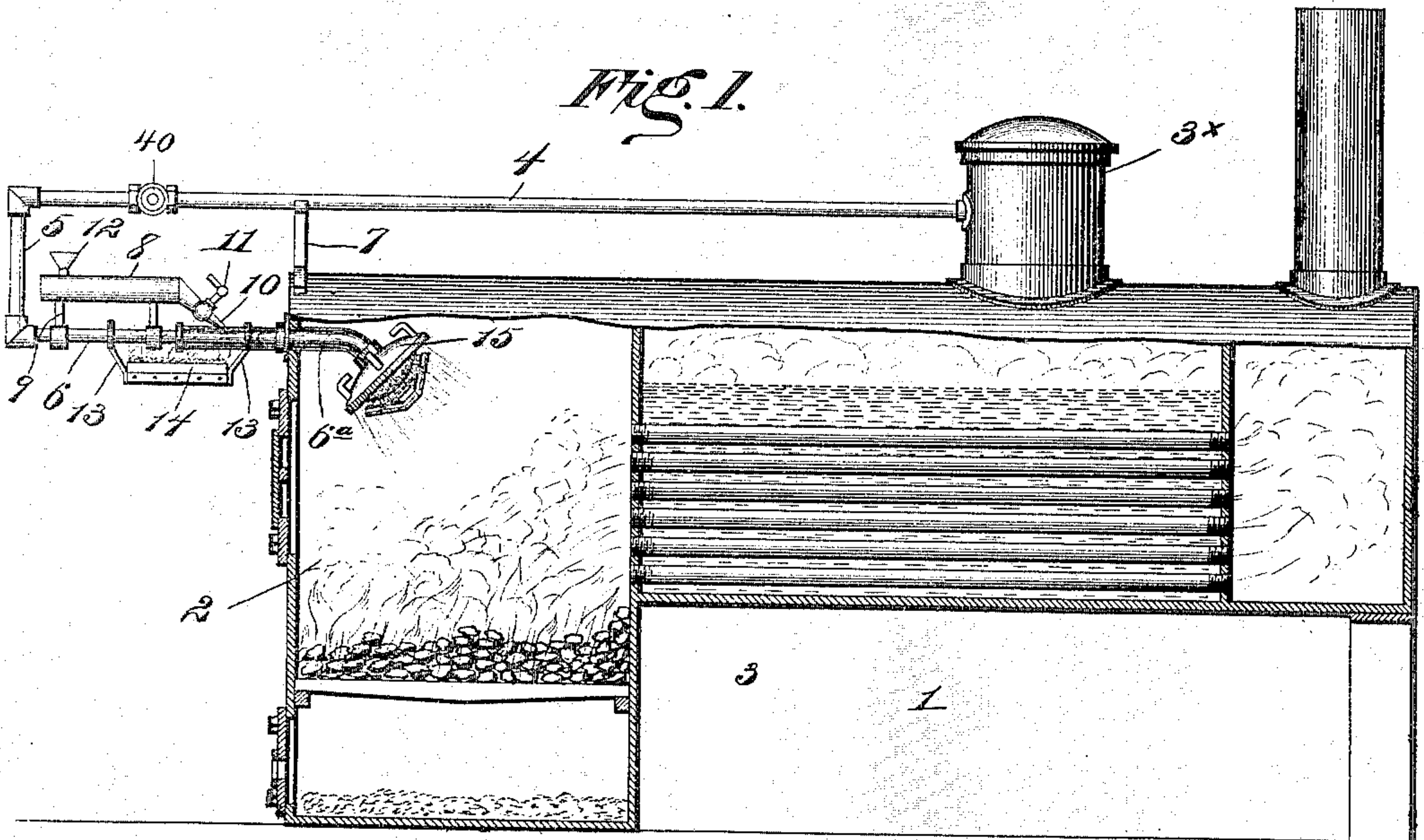
Patented Nov. 6, 1900.

I. C. McCLENTHEN.
SMOKE CONSUMER.

(Application filed Aug. 3, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses
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Attorney

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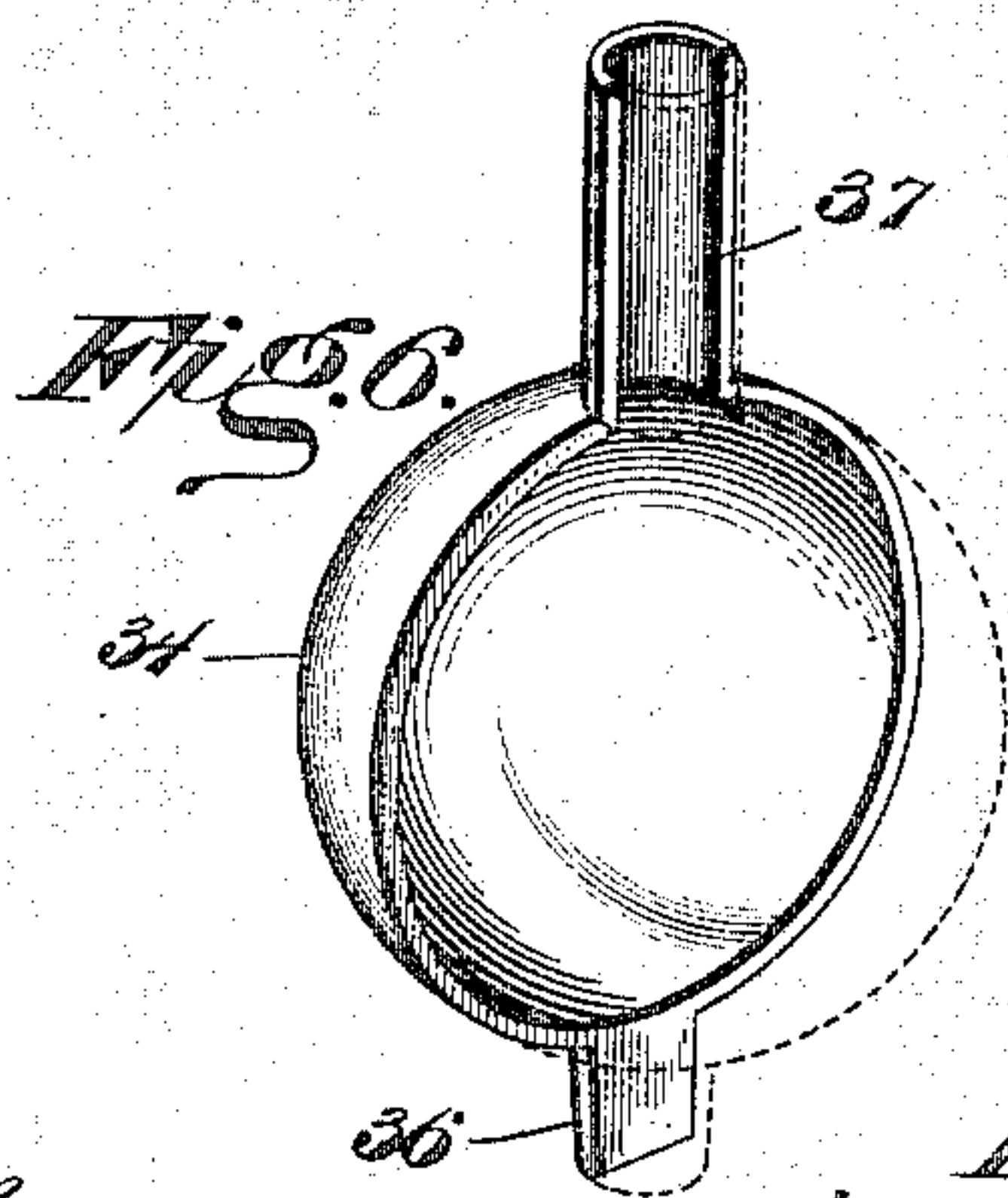
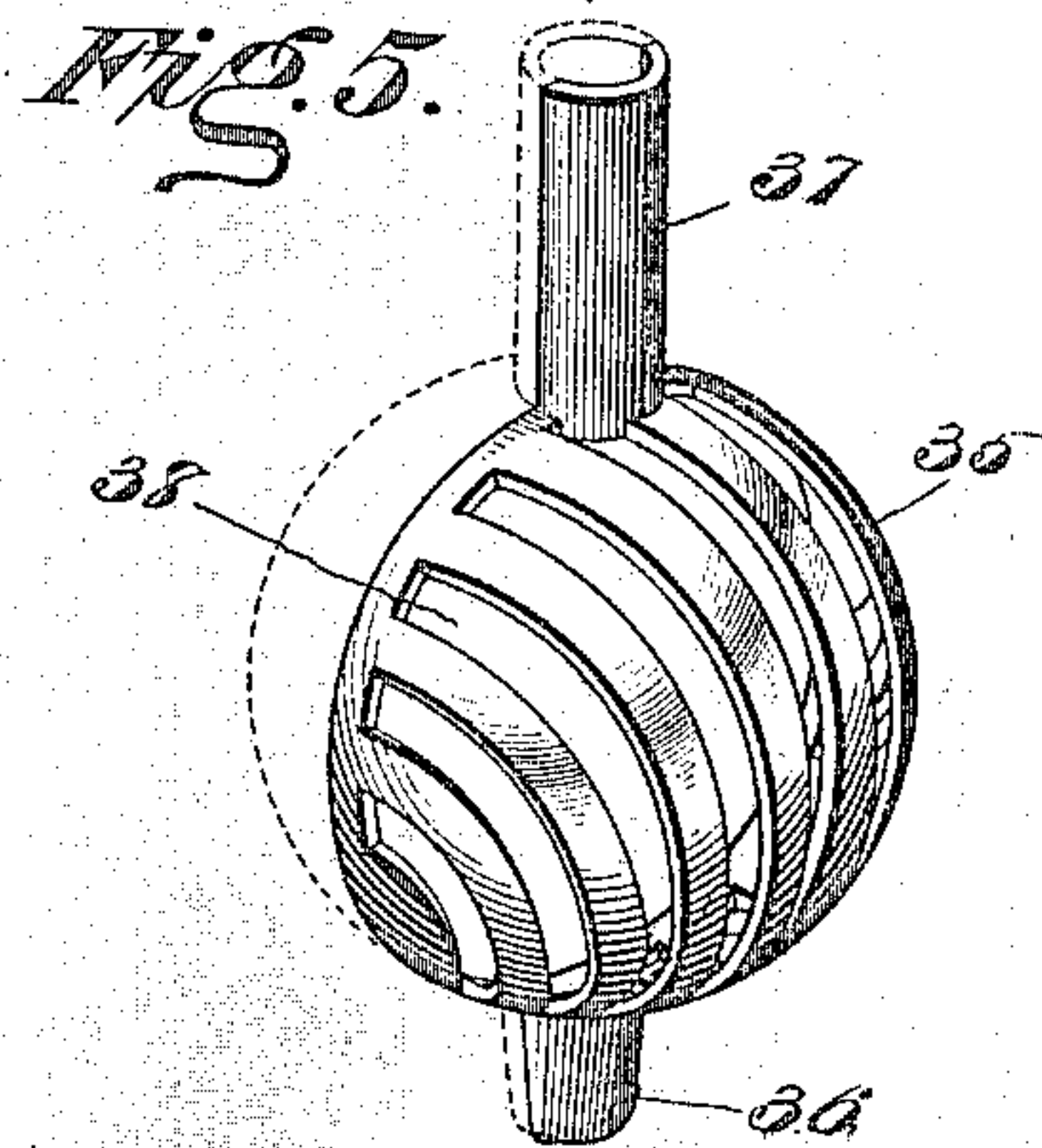
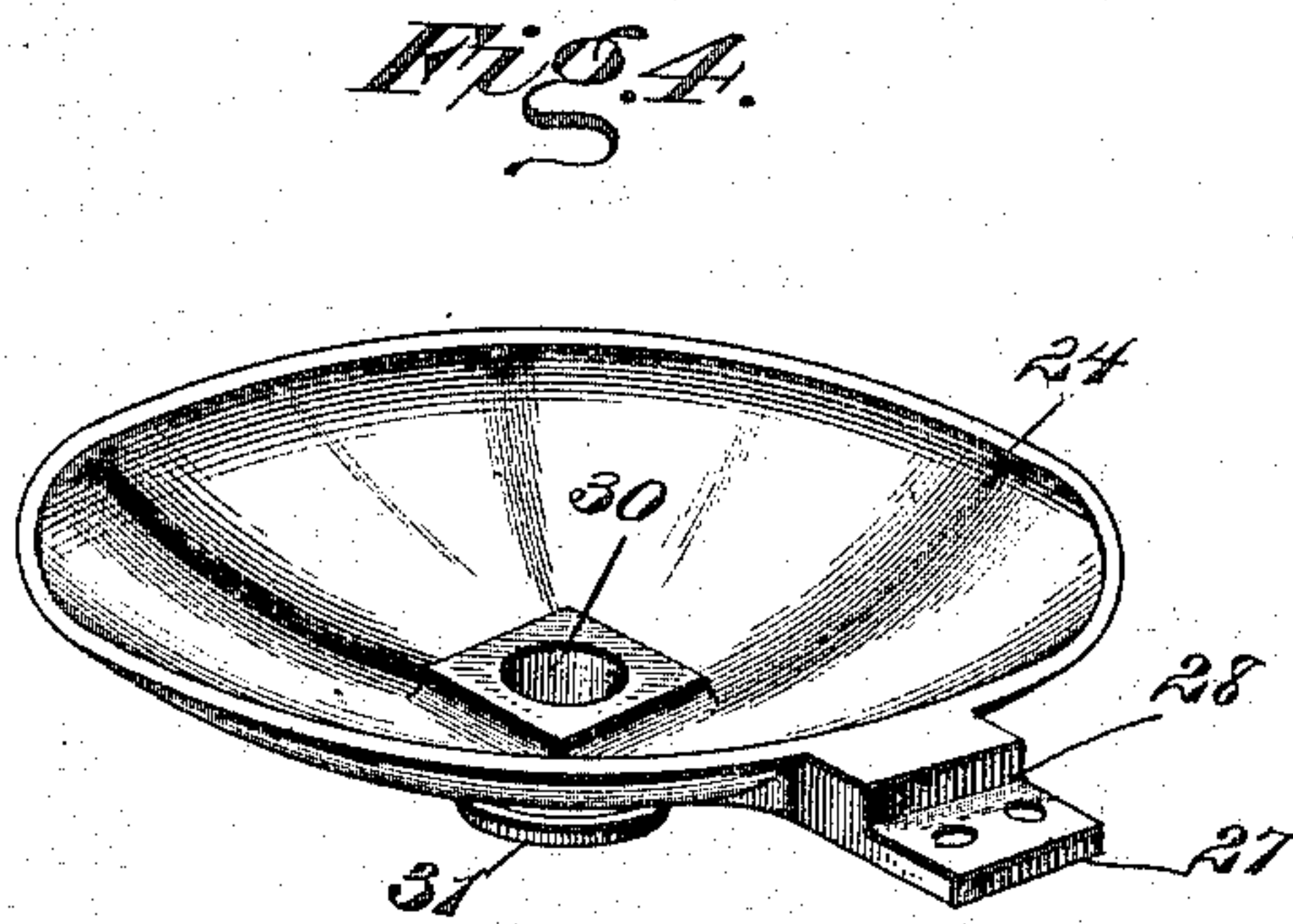
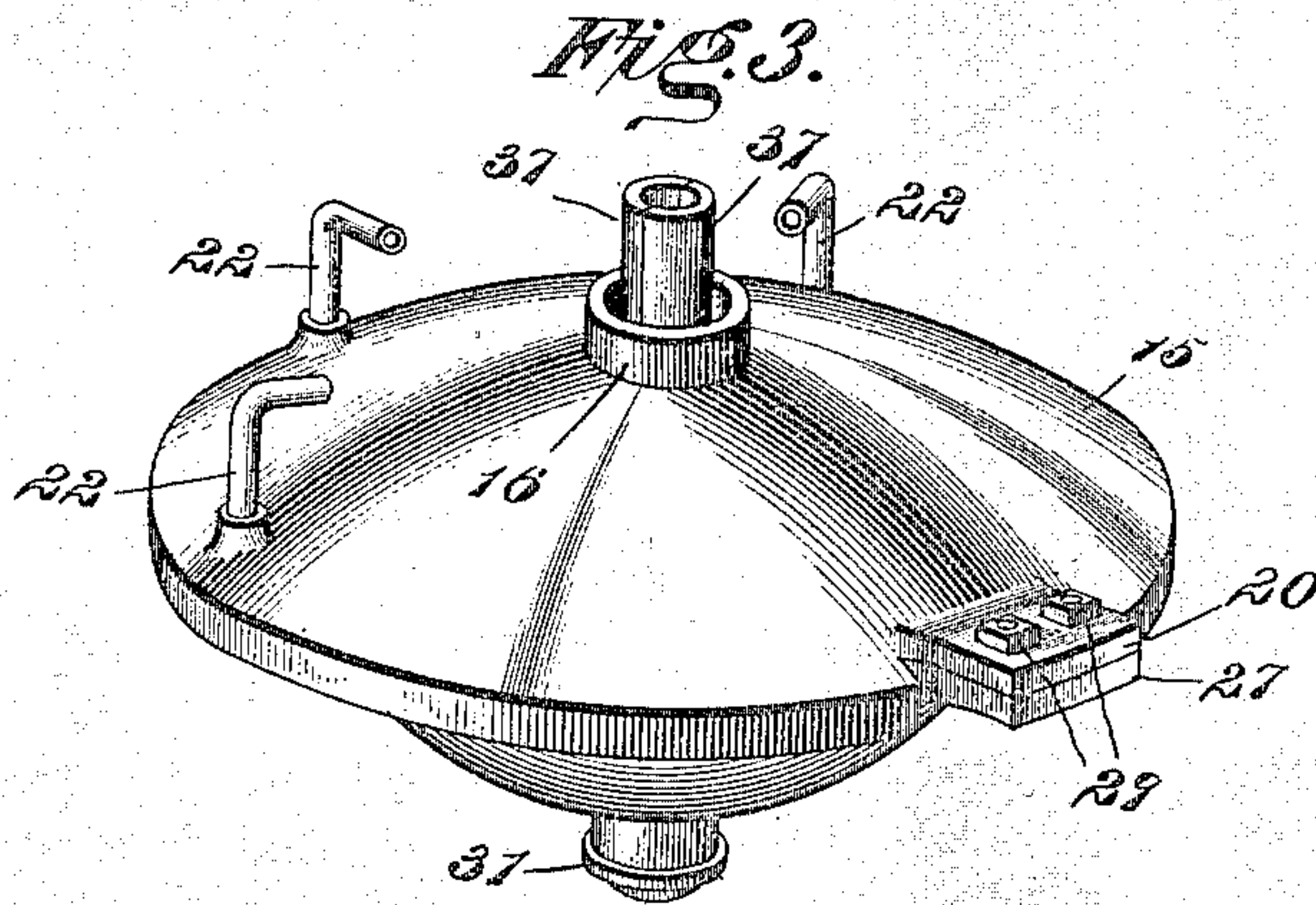
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2 Sheets—Sheet 2.



Witnesses

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UNITED STATES PATENT OFFICE.

IRA C. McCLENTHEN, OF HEBRON, INDIANA.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 661,477, dated November 6, 1900.

Application filed August 3, 1899. Serial No. 726,017. (No model.)

To all whom it may concern:

Be it known that I, IRA C. McCLENTHEN, a citizen of the United States, residing at Hebron, in the county of Porter and State of Indiana, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification.

My invention relates to smoke-consumers for boilers; and its primary object is to provide a simple and inexpensive device of the character named which will effectively consume the carbon contained in the smoke in the fire-box, thus materially increasing the combustion and saving fuel, and also avoiding the injurious effects of the soot ordinarily contained in the smoke from locomotive or stationary boilers.

The invention utilizes a combination of dry steam, gaseous vapors, and hot air to effect the purpose in view, and an apparatus of novel construction which will be fully described hereinafter in connection with the accompanying drawings, which form a part of this specification.

In the drawings, Figure 1 is a vertical sectional view of a boiler provided with my invention. Fig. 2 is a central vertical section, on an enlarged scale, of that portion of the apparatus which is located within the fire-box. Fig. 3 is a view in perspective of the retort of the device, and Figs. 4, 5, and 6 are detail perspective views of parts of the retort.

Referring to Fig. 1, the reference-numeral 1 designates a boiler of the usual or any preferred construction, having the fire-box 2, tubes 3, and steam-dome 3^x. From the dome 3^x a steam-pipe 4 extends rearward, connecting by a vertical pipe 5 and a horizontal pipe 6 with the interior of the fire-box 2. The pipe 4 may be supported in any suitable manner, as by a bracket 7, projecting above the boiler. The inner end of the pipe 6 is bent downwardly to support the retort of the apparatus within the fire-box at an angle of approximately forty-five degrees.

8 designates an oil-tank supported adjacent to the steam-pipe 6, as by brackets 9, and having a downwardly-inclined spout 10, communicating with an enlarged portion 6^a, secured to pipe 6 and forming a vaporizing-chamber therein. This spout 10 is provided with a cock or valve 11 to control the flow

of oil to the vaporizing-chamber 6^a, and the tank is provided with a filling-funnel or oil-inlet 12. Below the pipe 6 is suitably supported, as by hangers 13, Fig. 1, a burner comprising a frame and an asbestos wick 14 therein adapted to be saturated with kerosene or like inflammable liquid and lighted to generate the initial charge of gas, as will be further explained hereinafter.

The construction of the retort and its casing will now be described. The upper section of the casing of the retort consists of a concavo-convex plate 15, formed with a central opening surrounded on its outer side by an internally-threaded annular flange 16 and on its inner side with a projecting collar 17. The threaded flange 16 receives the externally-threaded end 19 of the pipe 6, while the inner collar 17 serves as a guide for the stem of the retort, as hereinafter described. The plate 15 is formed at one side with a lug 20 and at a plurality of points is provided with openings 21, into each of which is secured an angle-pipe 22, serving as an inlet for air. The under edge 23 of the plate 15 is outwardly flared or beveled to direct the vapors downward and act as a spreader to distribute the vapors over the coal in the fire-box. The lower plate 24 of the casing also consists of a concavo-convex plate arranged reversely to the plate 15, so that the two plates when secured together constitute a hollow chamber 26 to contain the mixer. This plate 24 is formed with a lug 27 and is recessed at the point 28 to adapt the lug 27 to fit against the lug 20 of the upper plate 15, to which it is secured by bolts and nuts 29. Plate 24 is smaller in diameter than the upper plate 15, and a passage is formed at the edge thereof to permit the escape of the gases discharged into the casing formed by said plates. The plate 24 is also formed with a central opening or bearing 30, surrounded on its under side by a collar 31, which is preferably grooved annularly for the attachment thereto of a burner comprising a hanger 32 for supporting an asbestos wick 33 below the retort. The mixer comprises a hollow sphere consisting of two semispherical sections 34 and 35, each formed at its lower side with a solid semicircular lug 36 and at its opposite side with a hollow semicircular projection 37. When the

two sections 34 and 35 are brought together, as shown in Fig. 2, the lugs 36 form a circular lug fitting the opening 30 of the plate 24, and the projections 37 constitute a hollow stem which passes through the central opening of the plate 15 into the end of the pipe 6, being supported by the flange or collar 17 of the plate. The section 34 of the retort is imperforate, as shown, while the section 35 is formed with a series of parallel slots 38, extending almost entirely across the section for the escape of steam and gas into the chamber 26. These slots may be formed across the plate, as shown in Fig. 2, or lengthwise thereof, as illustrated in Fig. 5.

The operation of the apparatus constructed as above described is as follows: The cock 11 is opened to allow oil to pass into the jacket 6^a, and the wick 14 is lighted to generate a vapor within the jacket 6^a before steam is admitted. By means of a valve 40 steam is admitted into the pipes 5 and 6. The commingling of steam and gas with the hot air which enters the pipe 22 materially increases the combustion and consumes the carbon in the smoke, thus effectually accomplishing the purpose in view.

Many of the details of construction herein shown and described may be varied without departing from the spirit of the invention. For example, the means shown for suspending or supporting the wicks may be changed or modified at will and other minor changes may be resorted to.

I claim—

1. In a smoke-consumer for boilers, the combination, with a steam-pipe projecting into the fire-box, of an oil-receptacle provided with a spout extending into the steam-pipe,

reversely-arranged concavo-convex plates forming a retort and secured to the steam-pipe within the fire-box; a mixer between the plates; and a burner below the retort.

2. In a smoke-consumer for boilers, the combination, with a steam-pipe projecting into the fire-box and having an enlarged portion and an oil-receptacle provided with a spout extending into said enlarged portion; of reversely-arranged concavo-convex plates forming a retort and secured to the steam-pipe within the fire-box; air-pipes projecting into the upper plate; a burner below, and adapted to heat the enlarged portion of the steam-pipe; means for controlling the flow of steam and oil; a mixer between the concavo-convex plates of the retort and comprising semicircular sections; and a burner below the retort.

3. The combination, with a boiler, of a steam-pipe, an enlarged portion thereto projecting into the fire-box and bent downward at an angle; an oil-receptacle communicating with the enlarged portion of the steam-pipe; a burner below, and adapted to heat said enlarged portion; a retort formed of two oppositely-disposed concavo-convex plates; air-pipes projecting from the upper plate; a burner below the lower plate; and a mixer arranged between said plates and comprising a hollow sphere made in sections one of which is formed with openings for the passage of vapor.

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

IRA C. McCLENTHEN.

Witnesses:

SARAH C. McCLENTHEN,
GEO. C. MOSIER.