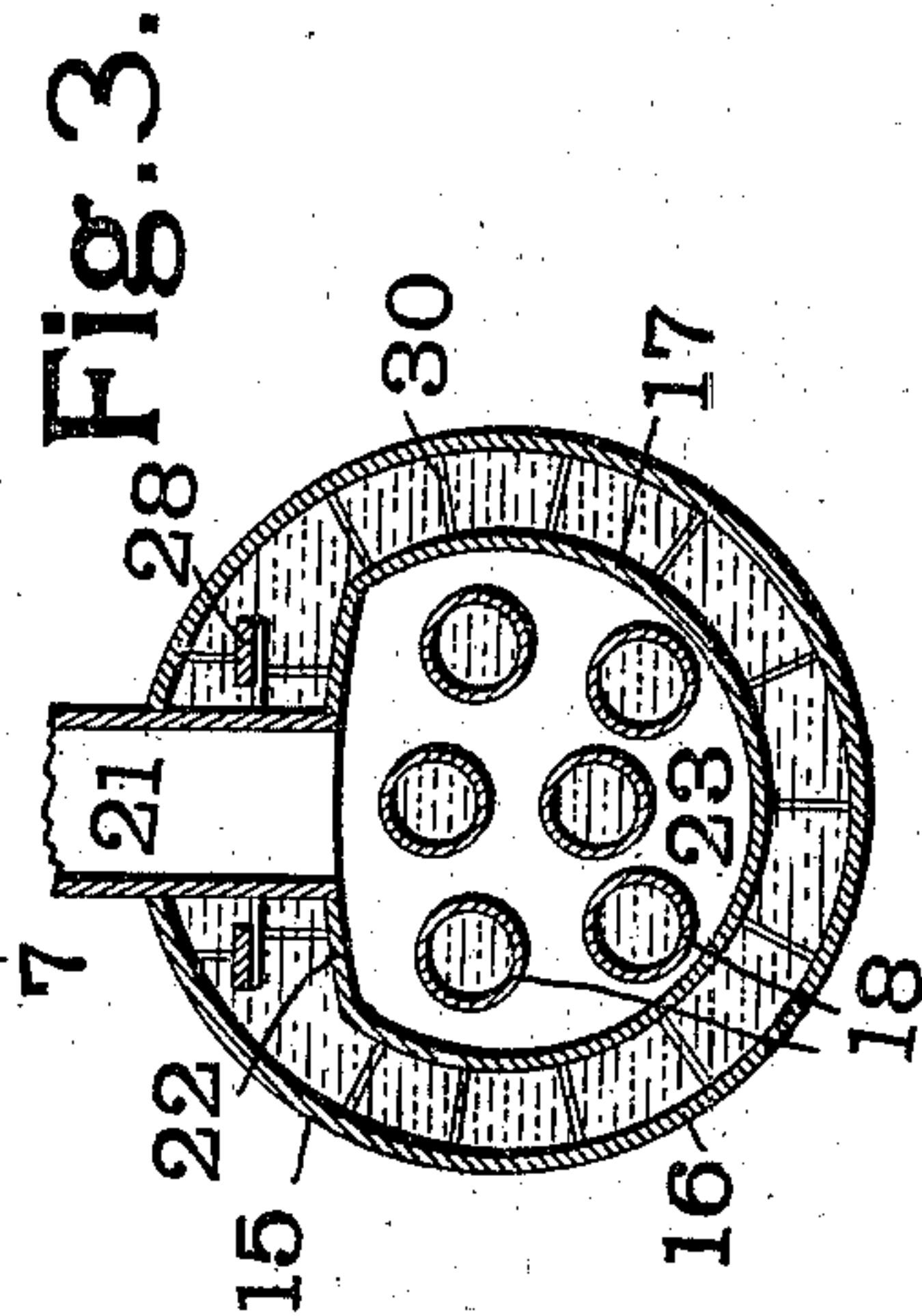
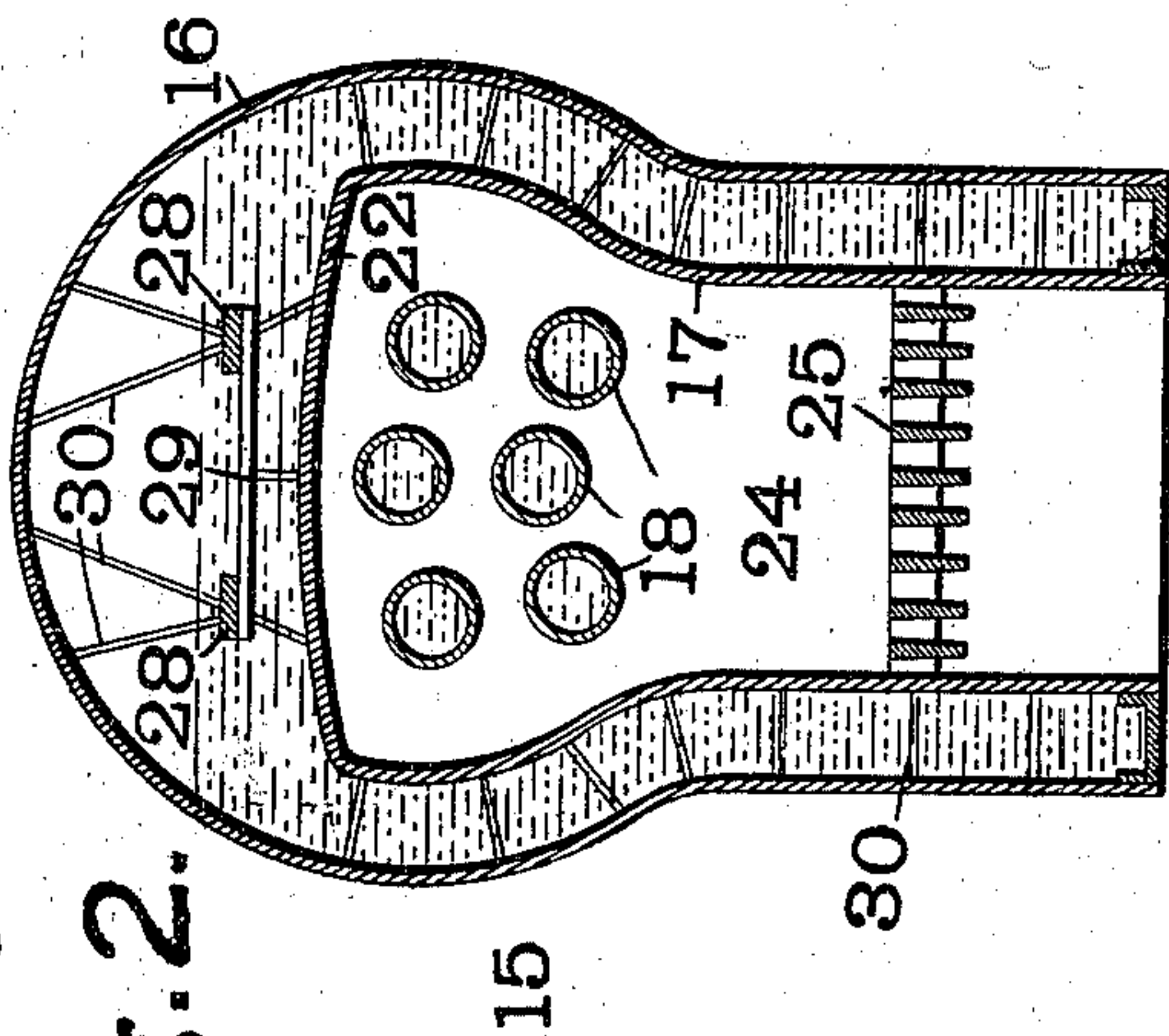
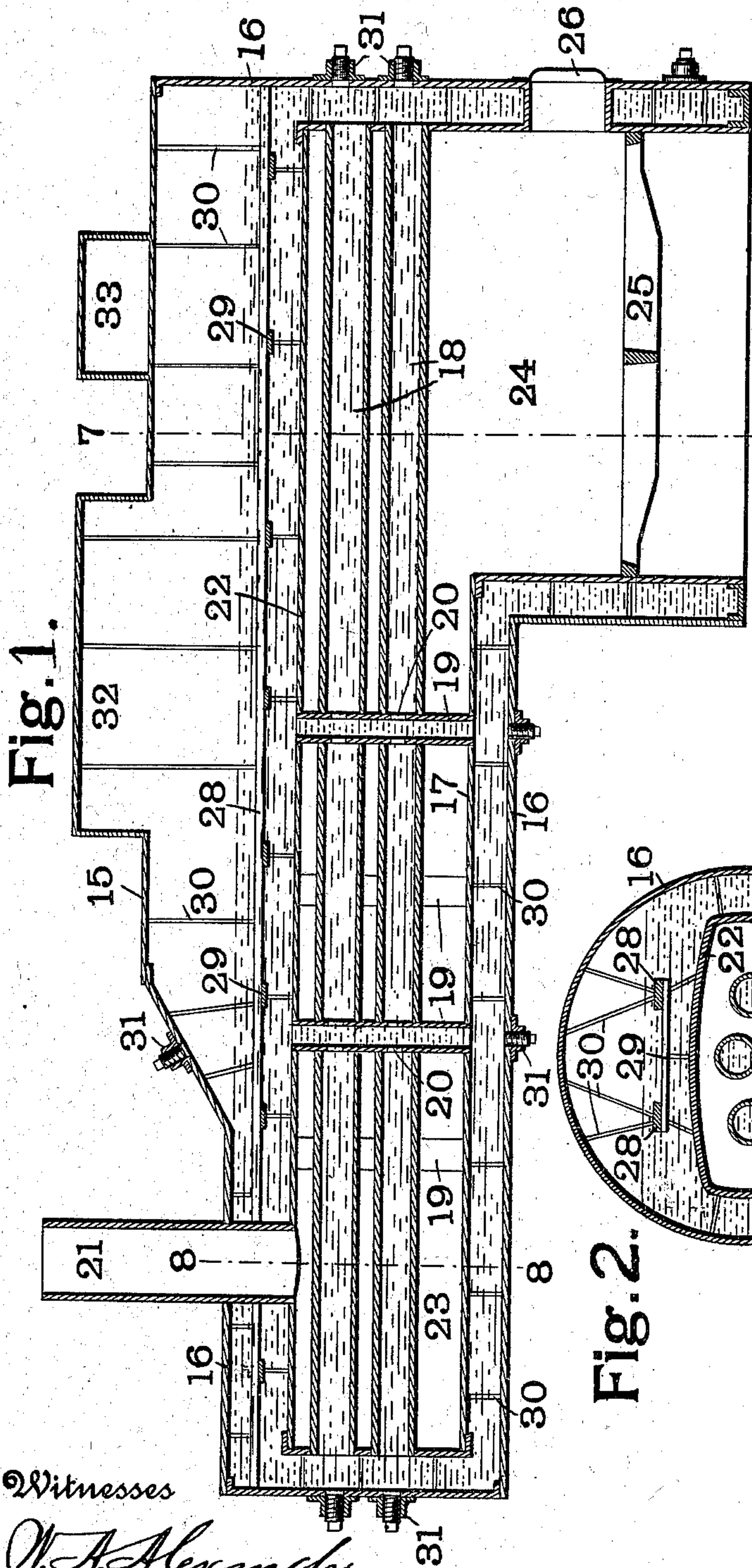


No. 709,430.

Patented Sept. 16, 1902.

J. H. WILLIAMS.
LOCOMOTIVE BOILER.
(Application filed Feb. 24, 1902.)

(No Model.)



Witnesses

W. A. Alexander
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UNITED STATES PATENT OFFICE.

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LOCOMOTIVE-BOILER.

SPECIFICATION forming part of Letters Patent No. 709,430, dated September 16, 1902.

Application filed February 24, 1902. Serial No. 95,235. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. WILLIAMS, a citizen of the United States, residing at Upper Alton, in the county of Madison and State of Illinois, have invented a certain new and useful Locomotive-Boiler, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to improvements in water-tube boilers for locomotives.

The object of my invention is to improve the construction of such boilers, so that the circulation of the water will be improved and so that the boiler can be readily cleaned.

My invention consists in a boiler for locomotives and the like, consisting of an inner shell, an outer shell, horizontal water-tubes passing through said inner shell, and vertical water-tubes passing through said inner shell and through said horizontal tubes.

In the accompanying drawings, which show so much of a locomotive as is necessary to illustrate one form of my invention, Figure 1 is a vertical longitudinal section of the boiler; and Figs. 2 and 3 are sections on the lines 7 7 and 8 8, respectively, of Fig. 1.

Like marks of reference refer to similar parts in the several views of the drawings.

The boiler 15 is composed of an outer shell 16 and an inner shell 17, arranged so as to leave a water-space between the two shells.

18 represents horizontal water-tubes, which pass longitudinally through the inner shell 17.

19 represents vertical water-tubes, which pass through the inner shell 17 and also through the horizontal tubes 18. These ver-

tical tubes 19 are provided with openings 20, opening into the horizontal tubes 18.

21 is the smoke-stack, which has its lower end secured in the crown-sheet 22 of the inner shell 17 and opens into the smoke-box 23, which is formed by the front part of the inner shell 17 and forms a continuation of the combustion-chamber 24. The lower end of the combustion-chamber 24 is provided with a grate 25 of the usual construction, to which fuel is fed through the door 26. Above the crown-sheet 22 are arranged two longitudinal bars 28, which are connected by tie-bars 29. These bars 28 and 29 are connected to the outer shell 16 and the crown-sheet 22 by means of stay-bolts 30, and stay-bolts 30 are also arranged between the outer and inner shells at suitable intervals to strengthen the boiler.

31 represents screw-plugs arranged to give access to the space between the inner and outer shells and to the water-tubes for washing out the boiler.

32 is a steam-dome, and 33 the sand-box.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

A boiler for locomotives and the like, consisting of an inner shell, an outer shell, horizontal water-tubes passing through said inner shell, and vertical water-tubes passing through said inner shell and through said horizontal tubes.

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

JOSEPH H. WILLIAMS. [L. S.]

Witnesses:

W. A. ALEXANDER,
Z. ALLEN.