

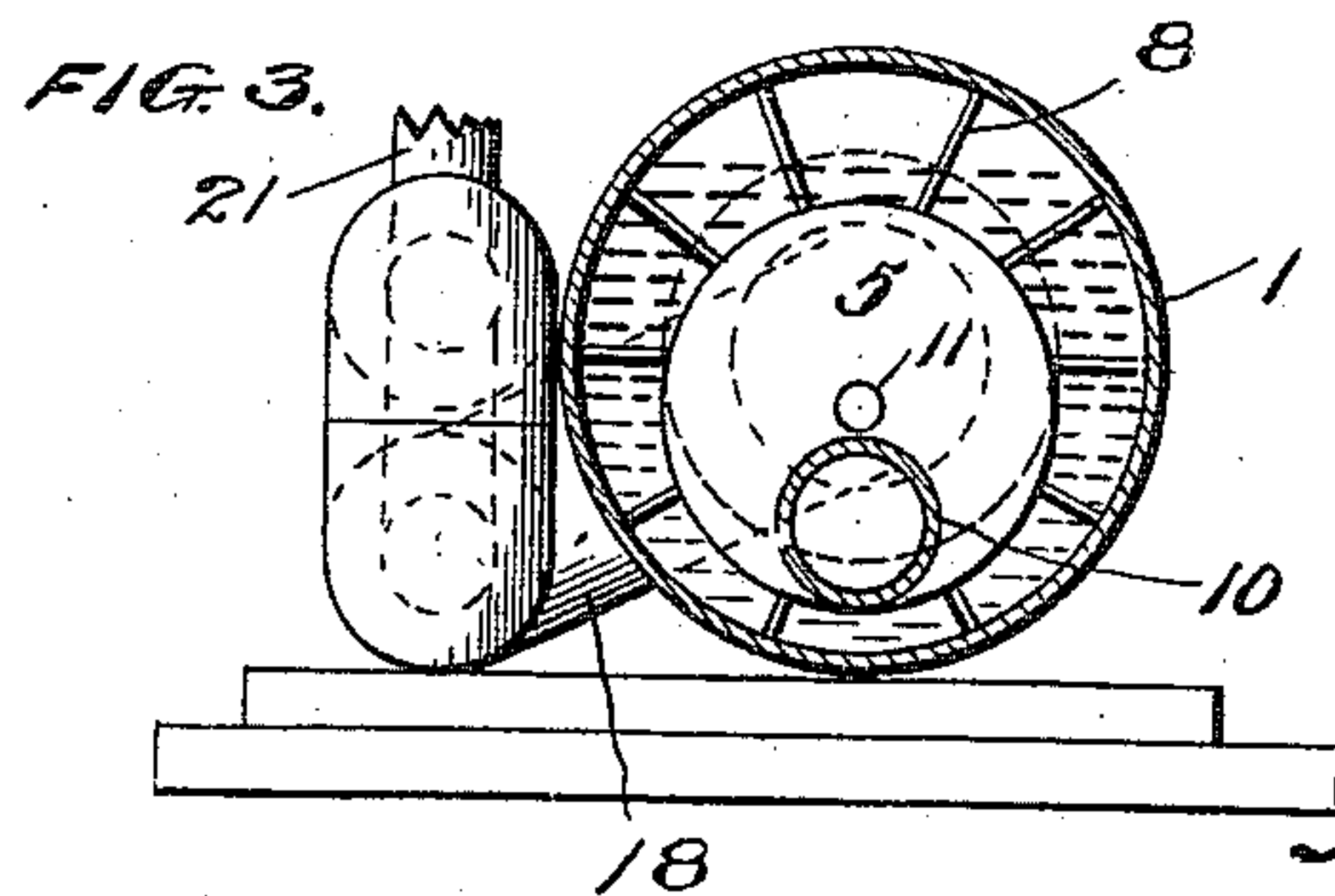
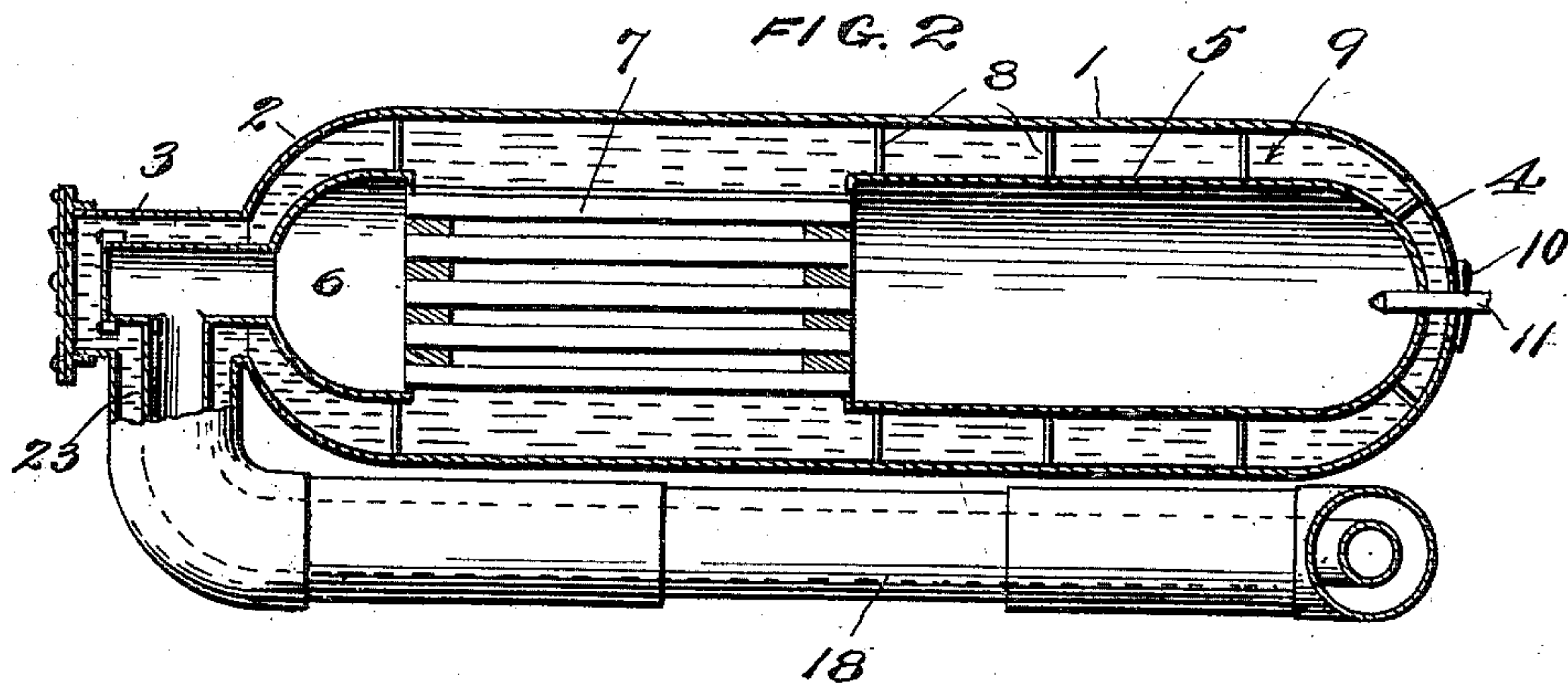
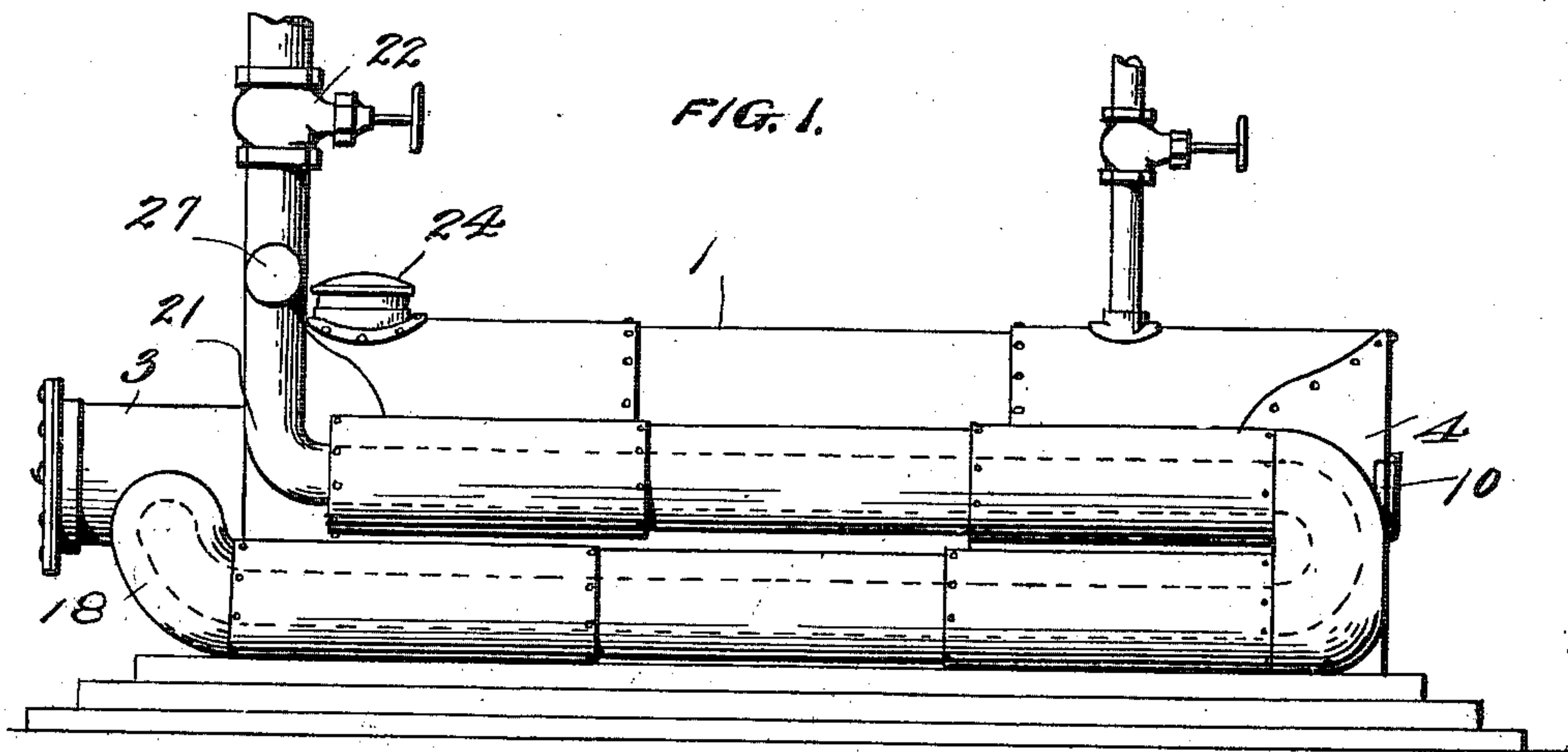
G. PETERSON.  
BOILER.

APPLICATION FILED MAY 18, 1910.

985,281.

Patented Feb. 28, 1911.

2 SHEETS—SHEET 1.



WITNESSES.

C. H. Davis  
M. E. Moore.

George Peterson  
INVENTOR

By *John P. Moore*  
Attorney

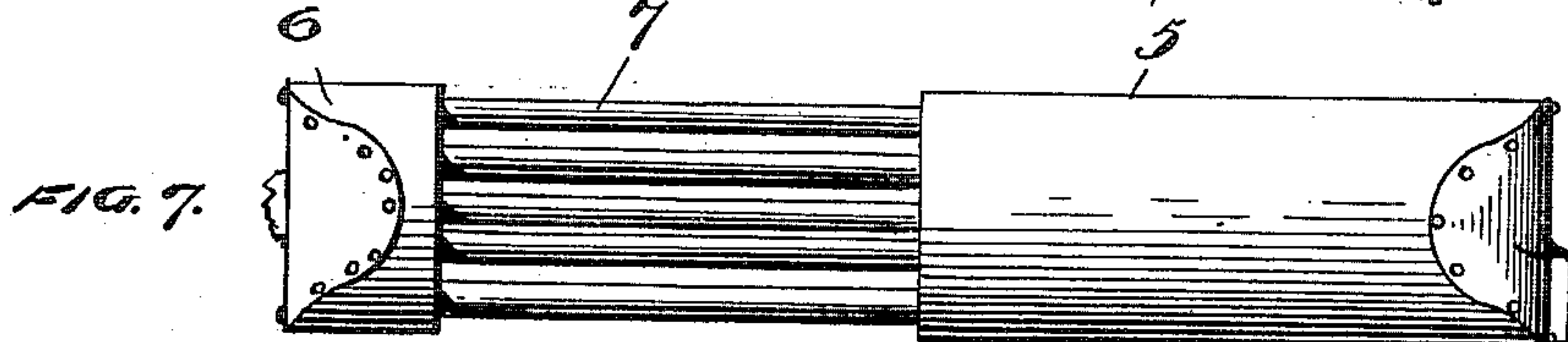
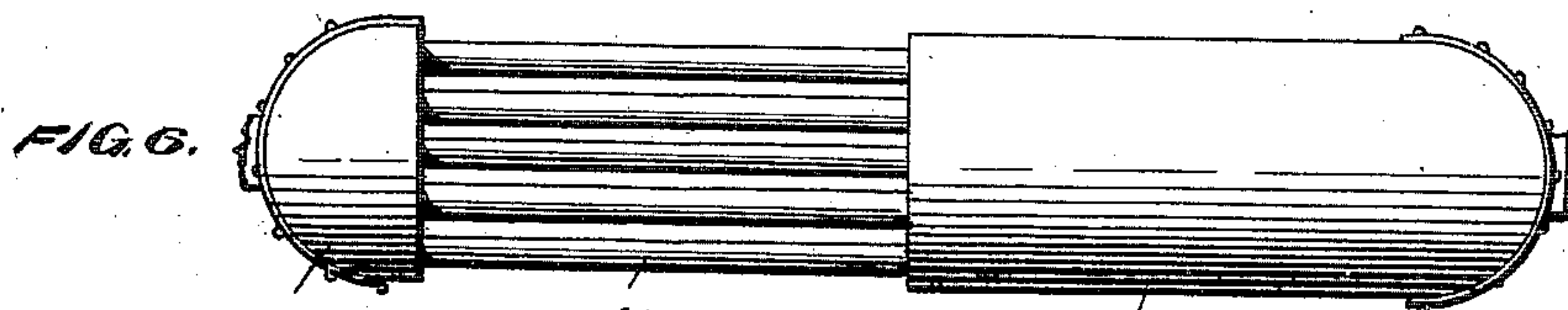
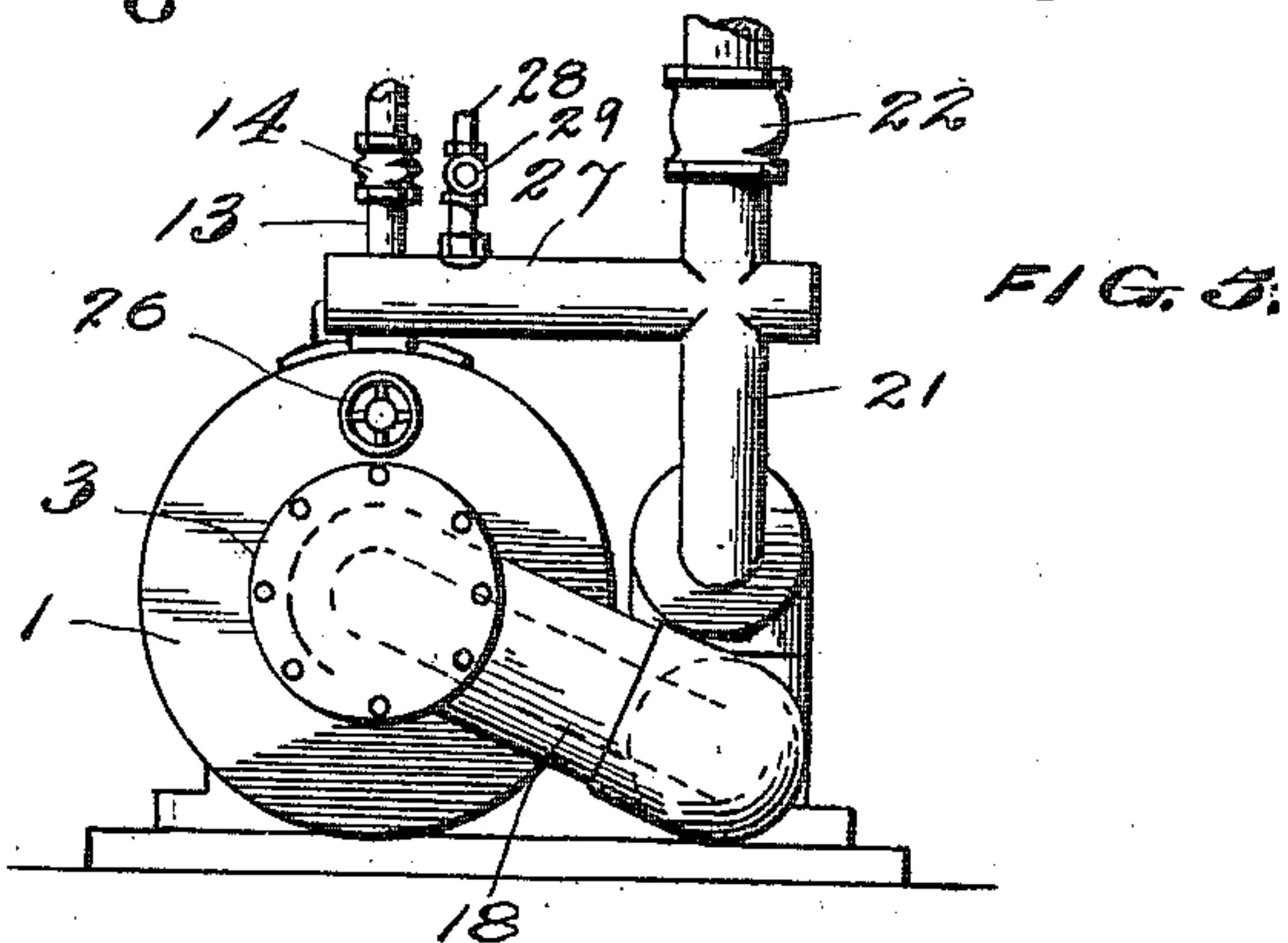
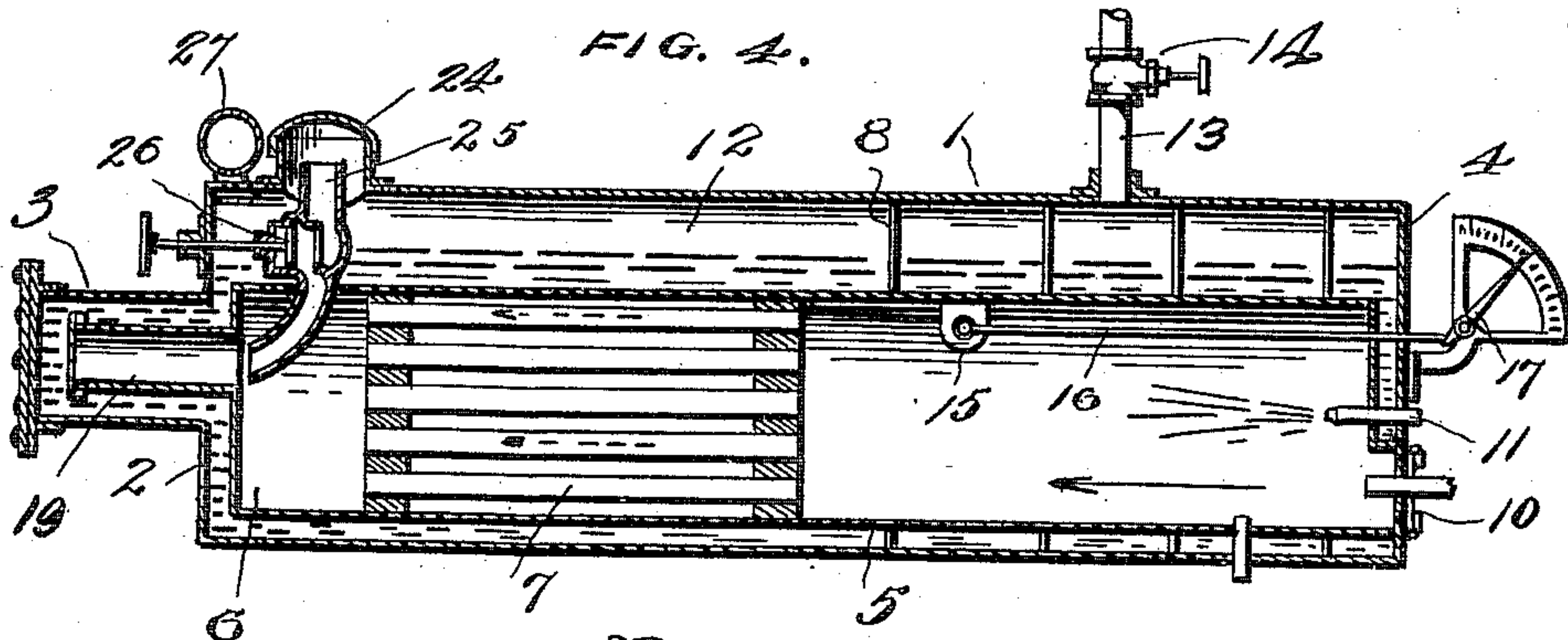
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2 SHEETS-SHEET 2.



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Attorney



# UNITED STATES PATENT OFFICE.

GEORGE PETERSON, OF DULUTH, MINNESOTA.

## BOILER.

985,281.

Specification of Letters Patent.

Patented Feb. 28, 1911.

Application filed May 18, 1910. Serial No. 562,027.

*To all whom it may concern:*

Be it known that I, GEORGE PETERSON, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Boilers, of which the following is a specification.

My invention relates to improvements in boilers, and has particular reference to oil burning furnaces for the generation of steam, and the leading object of my invention is the provision of an improved form of boiler which will utilize practically the entire amount of heat generated by the combustion of the fuel and which will further serve to superheat the steam after generation.

A further object of the invention is the provision of an improved form of boiler which will cause the heat to be directed directly against the steam to be superheated and will dispense with the intervention of metal plates or other heat absorbing surfaces.

Another object of the invention is the provision of a boiler which will utilize the full amount of heat generated therein and will mix the gases of combustion with the steam and direct said mixture into the machinery to be operated by the boiler.

To attain the objects of my invention, I have provided a boiler adapted to be heated by the combustion of liquid fuel which will utilize the gases of combustion as they pass from the boiler to heat the water-jacket of the boiler and which will further utilize said gases by mixing them with the steam to super-heat the same and supply additional power thereto, the invention further residing in the novel features of construction and combination and arrangement of parts for service substantially as described and as illustrated in the accompanying drawings.

Figure 1 represents a side elevation of my complete boiler. Fig. 2 represents a top plan view thereof partly in section. Fig. 3 represents a vertical sectional view of the boiler proper. Fig. 4 represents a longitudinal sectional view thereof. Fig. 5 represents an end view of the complete boiler. Fig. 6 represents a side elevation of the inner shell of the boiler with the flues, and, Fig. 7 represents a top plan view thereof.

In the drawings, in which similar characters of reference are employed to denote corresponding parts in the several views,

the numeral 1 designates the outer shell of the boiler, said shell having a rounded end 2 provided with an elongated neck portion 3 and having the other end rounded at 4. Mounted within the shell 1 and secured in position slightly above the bottom thereof is the inner shell 5 having a head portion 6 connected therewith by the flues 7, said parts being held away from the outer shell by the braces 8, and the space between the two shells is filled by the water-jacket 9, as best shown in Fig. 2.

Formed at the end 4 of the shell 1 is a door 10 permitting of access to the interior of the shell 5, said shell having a common wall with the shell 1 at this point, while located slightly above said door and projecting inward through the shells is the burner nozzle 11 for feeding the fuel for combustion into the inner shell, the combustion of said fuel serving to heat the shell and thus the water-jacket surrounding the same, and it will be noted that the said water does not extend to the top of the outer shell but lies a distance therebelow providing the steam storing space 12, while the shell is provided with a pipe 13 having a valve 14 for controlling the exhaust of steam from said space.

To determine the temperature within the inner shell, I secure therein to the lug 15 the metal rod 16 having a predetermined co-efficient of expansion, said rod passing through the shells and projecting therefrom to engage one end of the pivotally secured pointer 17 carried by the boiler, said pointer having its other end moving over a graduated sector 30 for indicating the temperature.

Extending laterally from the neck 3 of the outer shell is a pipe or tube 18 bent to extend longitudinally along the side of the boiler and having a reverse bend and extending back along the boiler above the other portion of the tube, while the cap member 6 of the inner shell is provided with a neck 19 having projecting therefrom and extending along within but spaced from the tube 18 the pipe 20 terminating in the upwardly extending portion 21 outside the pipe 18 which makes a water tight joint with the pipe 20, the portion 21 being connected with the smoke stack and having a valve 22 for controlling the flow of the gases of combustion therethrough. As will be seen by reference to the drawings, the space between the



two pipes is filled with a water jacket 23 in communication with the jacket 9 of the boiler, and as the gases of combustion pass from the flues into the head 6 and along the pipe 20 the heat thereof serves to warm the jacket 23 and thus to save that amount of fuel which would ordinarily be required to raise the temperature of the water were it entirely heated in the boiler by the direct action of the combustion. To aid said gases in their heating action and also to prevent the heavy and odorous smoke usually occasioned by the use of petroleum or like liquid fuel, I provide in connection with the conductor pipe 20 improved smoke consuming or purifying means. Formed at the end 2 of the shell 1 is a steam dome 24, while extending into said dome is a pipe 25 controlled by the valve 26 to regulate the flow of steam therethrough, said pipe having its other end disposed centrally of the neck 19 and thus affording communication between the space containing the water jacket 9 and the hot air and gas chamber, said steam admitted through the pipe into the chamber mixing with the gases and being superheated thereby, while the moisture of the steam is sufficient to combine with the sooty, heavy matter carried by the gases and cause the said matter to be deposited in the pipe while only the purer gas passes out, the said mixture of gas and steam as it passes along the pipe 20 heating the pipe and its water-jacket.

Formed in the pipe 20 is an enlarged portion or steam reservoir 27, while located in the pipe thereabove is a valve 22 for regulating the flow of the mixed steam and gas into the stack. In operation, when the fire is started, the valve 22 is open and the gases pass therefrom, the steam passing through the pipe 25 when the device is first put into operation and serving as an ejector to create a stronger draft. After the boiler is in good working order the valve 22 is closed when the mixture of gas and steam will be prevented from passing into the stack and will be contained in the reservoir 27, while leading from the reservoir is a pipe 28 controlled by a valve 29 and adapted to be connected with an engine or like machinery for operating the same.

I claim:

1. In a boiler, the combination with an inner shell, of a water jacket therearound inclosed by an outer shell, a steam dome at the top of the outer shell, a draft pipe lead-

ing from the inner shell, a pipe leading from the dome and adapted to empty into the draft pipe, a valve for controlling said second pipe, and a steam reservoir for containing the mixed steam and gas of combustion.

2. In a boiler, the combination with the inner and outer shells having a water jacket therebetween, of a coil having a water jacket, said coil leading from the inner shell, means for providing combustion in the inner shell, the coil serving to conduct away the gases of combustion, and means for introducing steam into said coil.

3. In a boiler, the combination with the shell of means for providing combustion therein, a casing surrounding said shell and spaced therefrom and rounding upward a considerable distance thereabove at its upper portion, liquid surrounding the shell and partly filling the dome portion of the casing, a coil leading from the shell and provided with a water jacket in communication with the liquid between the shell and casing, and means for introducing steam from the dome portion of the casing into the coil.

4. In a steam generating apparatus, the combination with the boiler, of means for providing combustion therein, an auxiliary water heating member adjacent the boiler, and means for introducing a mixture of the gases of combustion and steam into said member to heat the same.

5. A boiler, comprising inner and outer shells, means for retaining the same in spaced relation, a water jacket located between the shells, a pipe leading from the outer shell, a pipe leading from the inner shell and contained within the other pipe but projecting therefrom at the end thereof, a water jacket between said pipes, a steam dome in the outer shell, a discharge nozzle connected with the dome and adapted to discharge into the inner pipe, a valve controlling the flow of steam through said nozzle, a stack leading from the outer end of the inner pipe, a valve controlling the flow of the steam and gases through the stack, and a steam reservoir in communication with the pipe below the said valve and serving to collect the mixture when the valve is closed.

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

GEORGE PETERSON.

Witnesses:

I. GRETUM,  
EMMA OLSON.