

No. 731,211.

PATENTED JUNE 16, 1903.

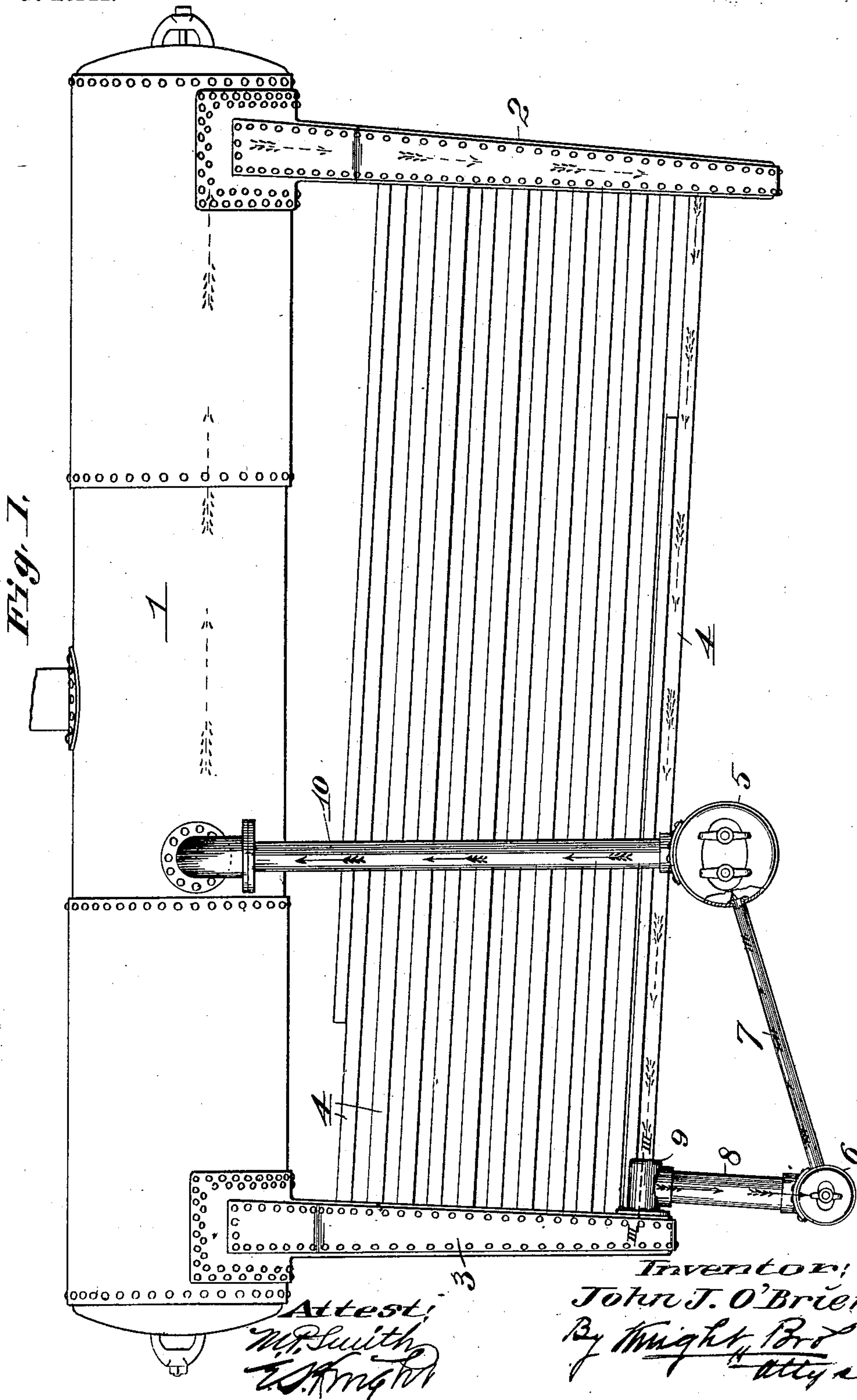
J. J. O'BRIEN.

WATER TUBE BOILER.

APPLICATION FILED MAR. 30, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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Fig. II.

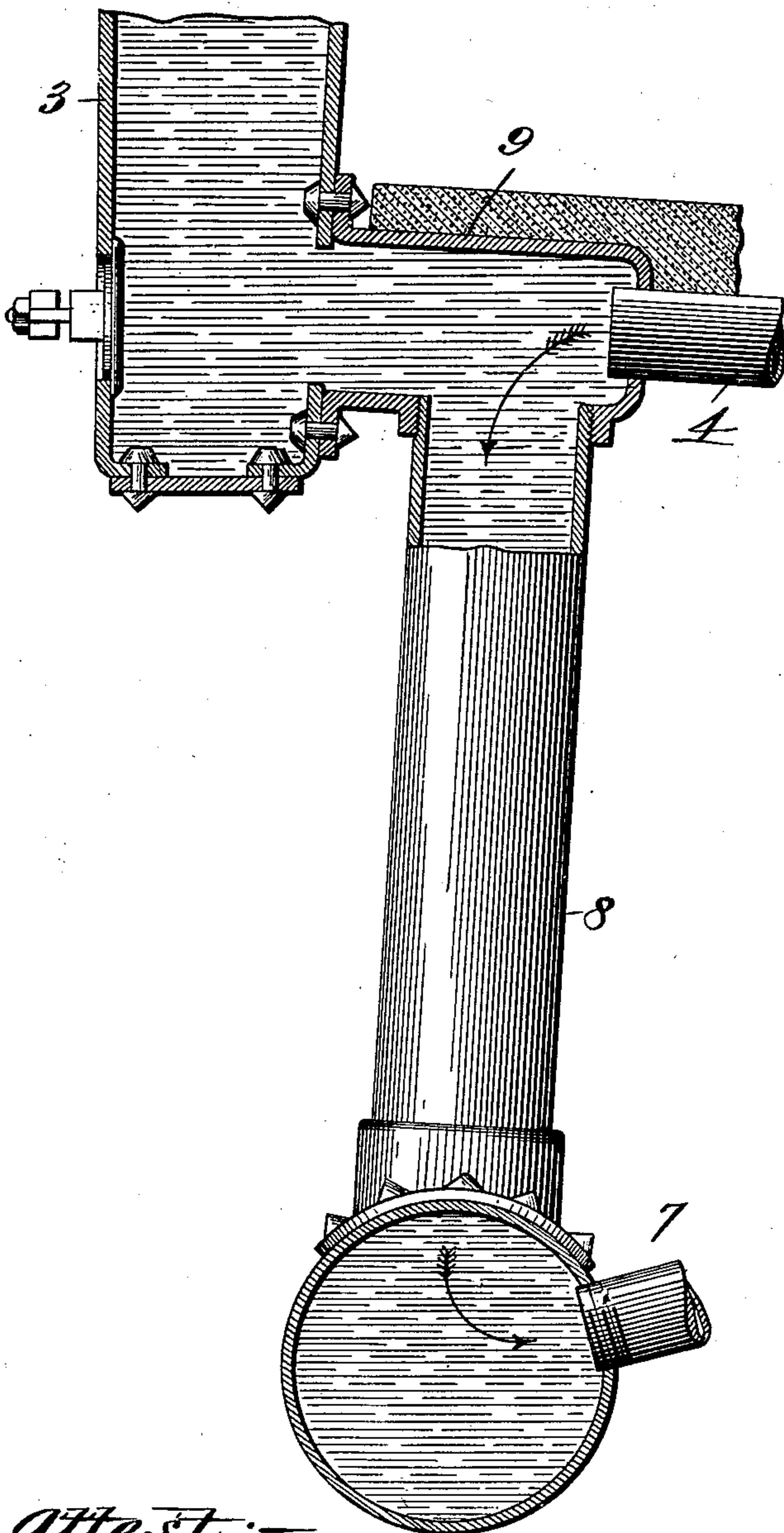
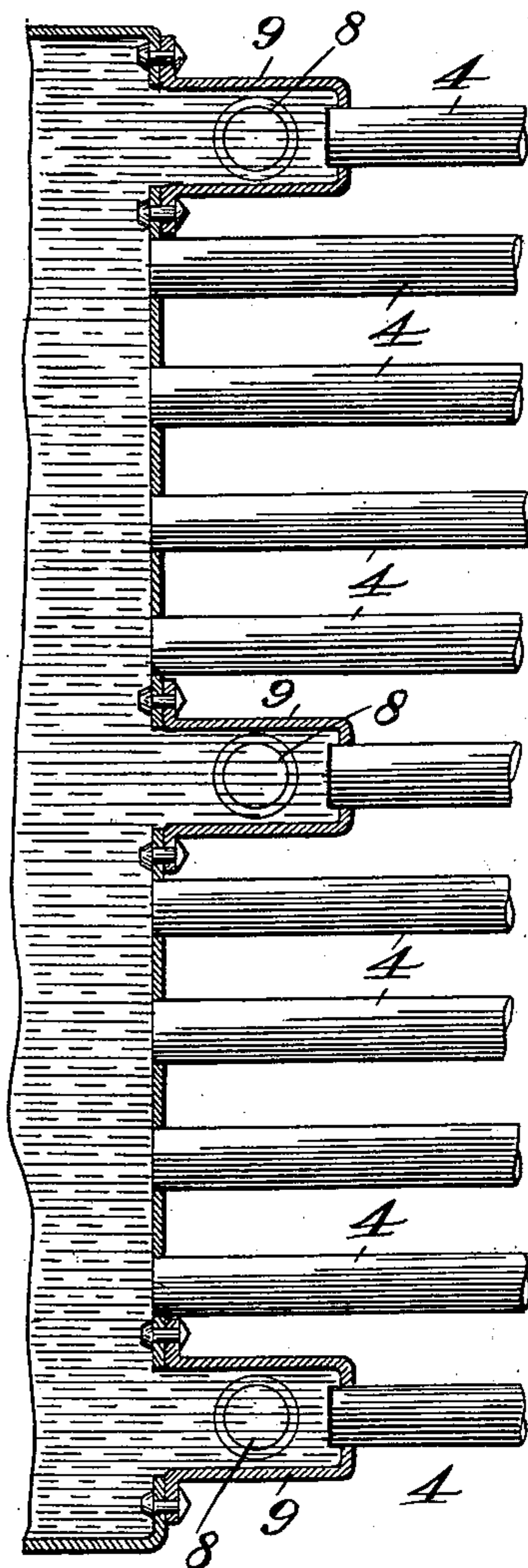


Fig. III.



Attest:—
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UNITED STATES PATENT OFFICE.

JOHN J. O'BRIEN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO JOHN O'BRIEN¹
BOILER WORKS COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 731,211, dated June 16, 1903.

Application filed March 30, 1903. Serial No. 150,132. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. O'BRIEN, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have
5 invented certain new and useful Improvements in Water-Tube Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.
10 tion.

The object of my invention is to so construct a boiler as to provide for an improved circulation of the water through the main drum, the water-legs, and the tubes of the
15 boiler.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a side elevation illustrative of my
20 invention. Fig. II is an enlarged detail section showing the lower end of the front water-leg, the front manifold, the connection between the manifold and the leg, the front end of one of the lower water-tubes that connect the water-legs together, and the end of
25 one of the tubes that connect the manifolds together. Fig. III is an enlarged detail horizontal section taken on line III III, Fig. I.

Referring to the drawings, 1 represents the
30 main drum of the boiler; 2, the rear water-leg; 3, the front water-leg; 4, the water-tubes that connect the legs together; 5, the inner manifold; 6, the outer manifold, and 7 the tubes that connect the manifolds together.

The outer manifold 6 is connected by pipes
35 8 (one at each end of the manifold and preferably one or more intermediate ones) to the front water-leg 3 by means of nipples 9, riveted or otherwise secured to the lower part
40 of the inner sheet of the water-leg and into which the upper ends of the tubes 8 are tapped. The lower row of water-tubes 4 connect with

the nipples 9 at their forward ends, as shown clearly in Fig. II.

The inner manifold 5 is connected by pipes 45 or tubes 10 to the drum 1.

When the boiler is in use, there is a circulation of water rearwardly through the drum 1, down the inner water-leg, forwardly through all of the tubes 4, except part of the
50 lower row, into the front water-leg, and upwardly through the front water-leg into the drum. At the same time there is a free and undisturbed circulation of water from the inner water-leg forwardly through part of the
55 lower row of tubes into the nipples 9, down through the pipes 8, through the front manifold, through the tubes 7 into the inner manifold, and up through the pipes 10 into the
60 drum 1.

It has been found by actual experience that by thus constructing a boiler the gurgling and bubbling of water in the lower front manifold, which was common in the old construction, is avoided, and the front manifold
65 is much less liable to be burned out, as the circulation of water is much improved.

I claim as my invention—

In a water-tube boiler, the combination of a drum, front and rear water-legs, inner and
70 outer manifolds, pipes connecting the inner manifold to the drum, nipples connected to the front water-leg, pipes connecting said nipples to the outer manifold, and pipes connecting the manifolds together; part of the
75 lower row of water-tubes forming a connection between the rear water-leg and said nipples, and the water-tubes above the lower row connecting the water-legs together, substantially as set forth.

JOHN J. O'BRIEN.

In presence of—

E. S. KNIGHT,
M. P. SMITH.