No. 737,886. PATENTED SEPT. 1, 1903.

J. P. URBANEK.

CIRCULATOR FOR STEAM BOILERS.

APPLICATION FILED MAR. 26, 1903.

NO MODEL.

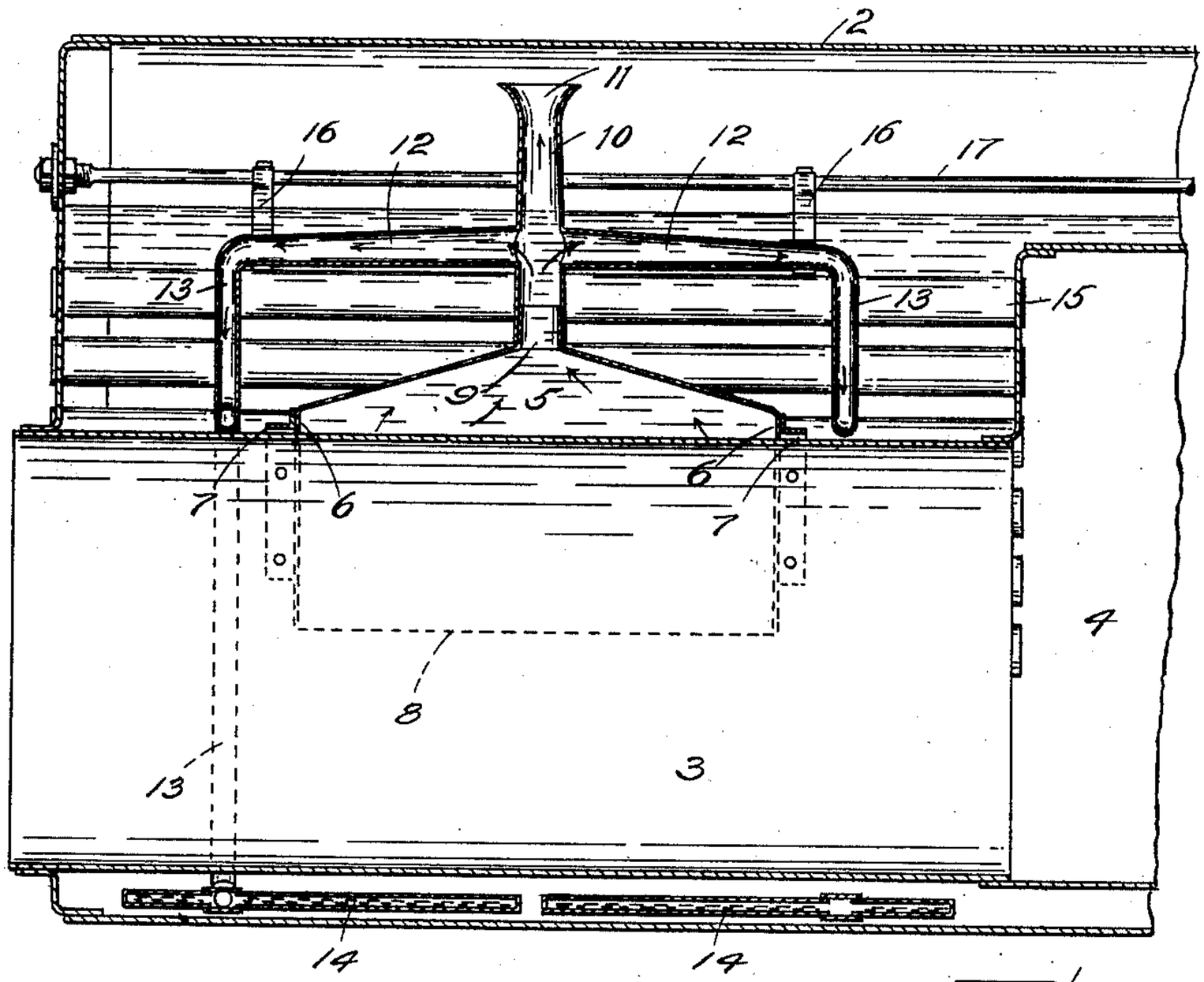

FIG. 1.

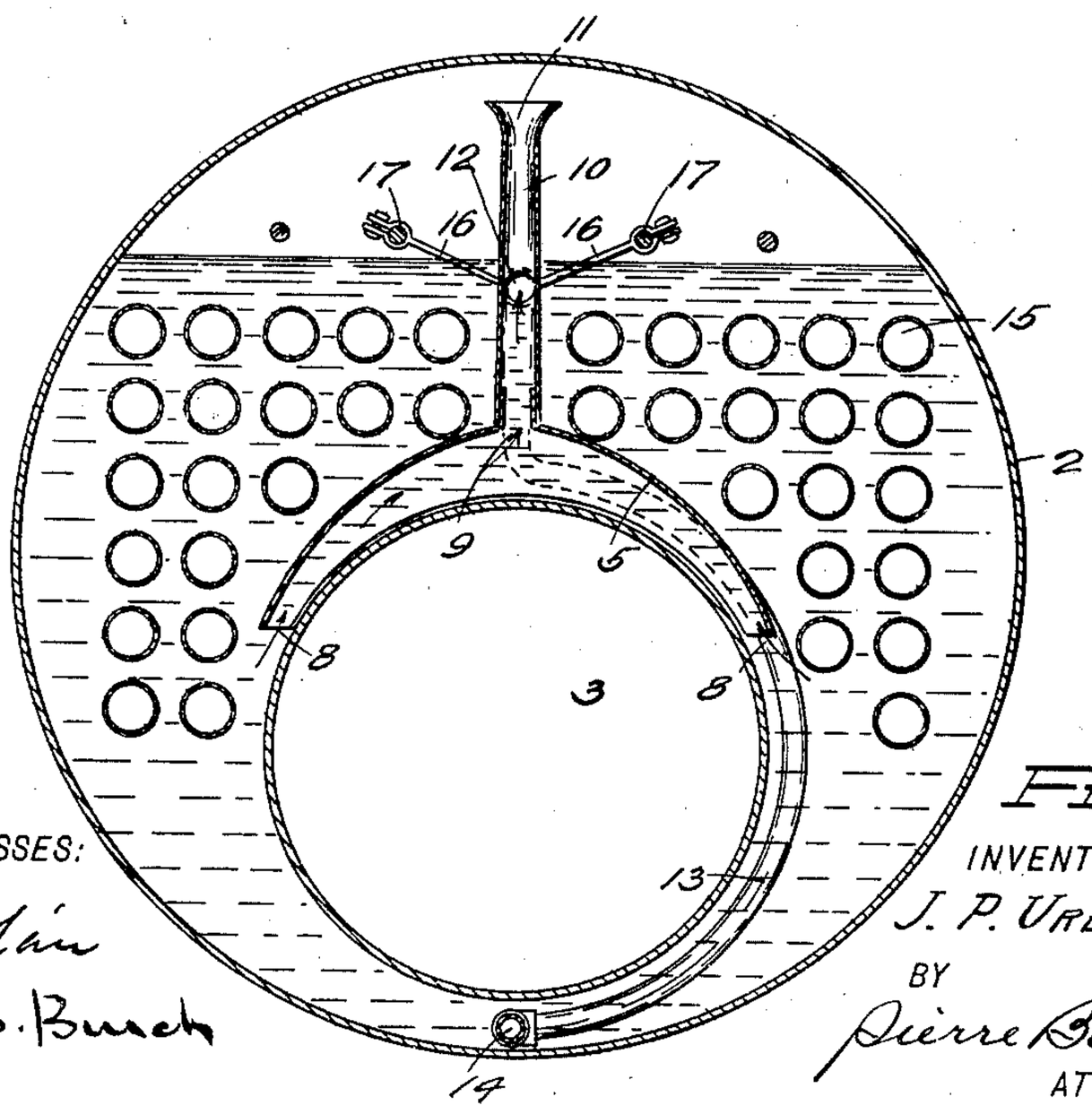

FIG. 2.

WITNESSES:

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No. 737,886. Patented September 1, 1903.

UNITED STATES PATENT OFFICE.

JOHN P. URBANEK, OF YORK, WASHINGTON.

CIRCULATOR FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 737,886, dated September 1, 1903.

Application filed March 26, 1903. Serial No. 149,644. (No model.)

To all whom it may concern:

Be it known that I, JOHN P. URBANEK, a citizen of the United States, residing at York, in the county of King and State of Washington, have invented certain new and useful Improvements in Circulators for Steam-Boilers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to steam-boilers; and it consists in improved apparatus adapted to promote the circulation of water and the more rapid generation of steam within a boiler, as will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, in which similar numerals denote corresponding parts in both views, Figure 1 is a longitudinal vertical section of a boiler and my invention applied thereto, and Fig. 2 is a transverse vertical section of the same.

In the said drawings the reference-numeral 2 indicates the shell of a tubular boiler having an internal furnace 3 and a combustion-chamber 4. Positioned above the "crown-sheet" or top of the furnace and within the water-space of the boiler is a hood 5, which may be of any convenient length and of width preferably equal to or greater than the horizontal diameter of the furnace. The hood is of conoidal form and is fastened by flanges 6 at its ends to bridge-pieces, such as 7, secured to the furnace-shell. The longitudinal edges 8 of the hood are distanced about two inches from the furnace-shell to permit the ready inflow of water thereat and also provide means for removing the scale deposited upon the outer surface of the furnace's shell, which may be advantageously done by drawing a chain thereacross. At the apex of the hood is an opening 9, which is connected to a vertical upflow-pipe 10, extending above the water-level of the boiler and having at its upper extremity a flaring open mouth, as 11. One or more branch outlet-pipes 12 are provided in the upflow-pipe and arranged so as to be at a short distance below the lowest level of water carried in the boiler and are connected by downflow-pipes 13, extending to or near the bottom of the boiler, which in the type of boiler shown would be preferably underneath the furnace. The lower extremities of the downflow-pipes terminate in perforated pipe ends 14. The various pipe parts of the apparatus may be secured in any suitable manner to the boiler, and I find in practice that this may be efficiently done by the use of braces, such as 16, connecting a convenient part thereof—as, for instance, the branch members 12—with the longitudinal stays 17 or their equivalent usually found in steam-boilers. Instead of placing the said hood immediately above the furnace, as aforedescribed, it may with certain classes of boilers be positioned above the boiler-tubes 15 and will act in the same manner, though to a less degree, as in the disposition of the parts shown in the drawings.

The operation of the invention is extremely simple, but perfectly adapted to accomplish the purposes for which intended, and is as follows: The water above and in contact with the hot crown-sheet of the furnace is quickly heated; but instead of allowing it to pass through and mingle with the body of superposed water to dissipate its heat therein, as is the common practice, the heated water and steam ascend through the upflow-pipe and separates therein, the steam passing directly into the space above the water and the heated water by the branch outlets and downflow-pipes to the lower part of the boiler, where it is distributed through the perforated pipe ends among the colder particles of water. The water in rising through the upflow-pipe is replaced upon the furnace-top by colder water entering into the spaces beneath the hood edges and which in turn is displaced by colder water, thus causing a perfect circulation of water within the boiler, a function unattainable by any other device which has come to my notice, and in so doing conveys and is facilitated by the upward movement or buoyancy of the evaporated water, which escapes into the steam-space of the boiler in a drier or less saturated condition than is possible if the steam were to pass through a relatively quiescent and cool body of water.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a steam-generator, the combination with a boiler and its furnace, of a hood located above the furnace, flanges formed on the hood

by which it is rigidly secured to the furnace, an upflow-pipe having a flaring mouth supported upon the hood, and means to transport the water heated under said hood to the lower part of the boiler.

2. In a steam-generator, the combination with a boiler and its furnace, of a hood located above the furnace, flanges formed on the hood by which it is rigidly secured to the furnace, a vertical upflow-pipe having a flaring mouth supported upon the hood, and a branch pipe connected to the vertical upflow-pipe and terminating in a horizontally-disposed perforated pipe at the bottom of the boiler.

3. In a steam-generator, the combination with a boiler and its furnace, of a conoidal-shaped hood, located above the furnace, downwardly-projecting flanges formed on the hood by which it is rigidly secured to the furnace, a vertical upflow-pipe connected to the top of the said hood and having a flaring mouth, branch outlet-pipes connected to the vertical upflow-pipe intermediate its length, said branch pipes curved around the furnace and terminating in horizontally-disposed perforated pipes, and means disposed longitudinally of the boiler to support the branch pipes.

4. In a steam-generator, the combination with a boiler and its furnace; of a hood located immediately above the said furnace and provided with an opening at its top, a connection between the said opening and the steam-space within the boiler, and communication between said connection at a point below the water-level and the bottom portion of the boiler.

5. An apparatus of the class described, comprising a conoidal-shaped hood, an uptake-pipe connected to the top of said hood and having an open upper end, branch outlets in said uptake-pipe intermediate its length, perforated pipes, and connections between said branch outlets and the said perforated pipes, substantially as and for the purposes set forth.

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

JOHN P. URBANEK.

Witnesses:
PIERRE BARNES,
P. C. DORMITZER.