No. 754,697. PATENTED MAR. 15, 1904.

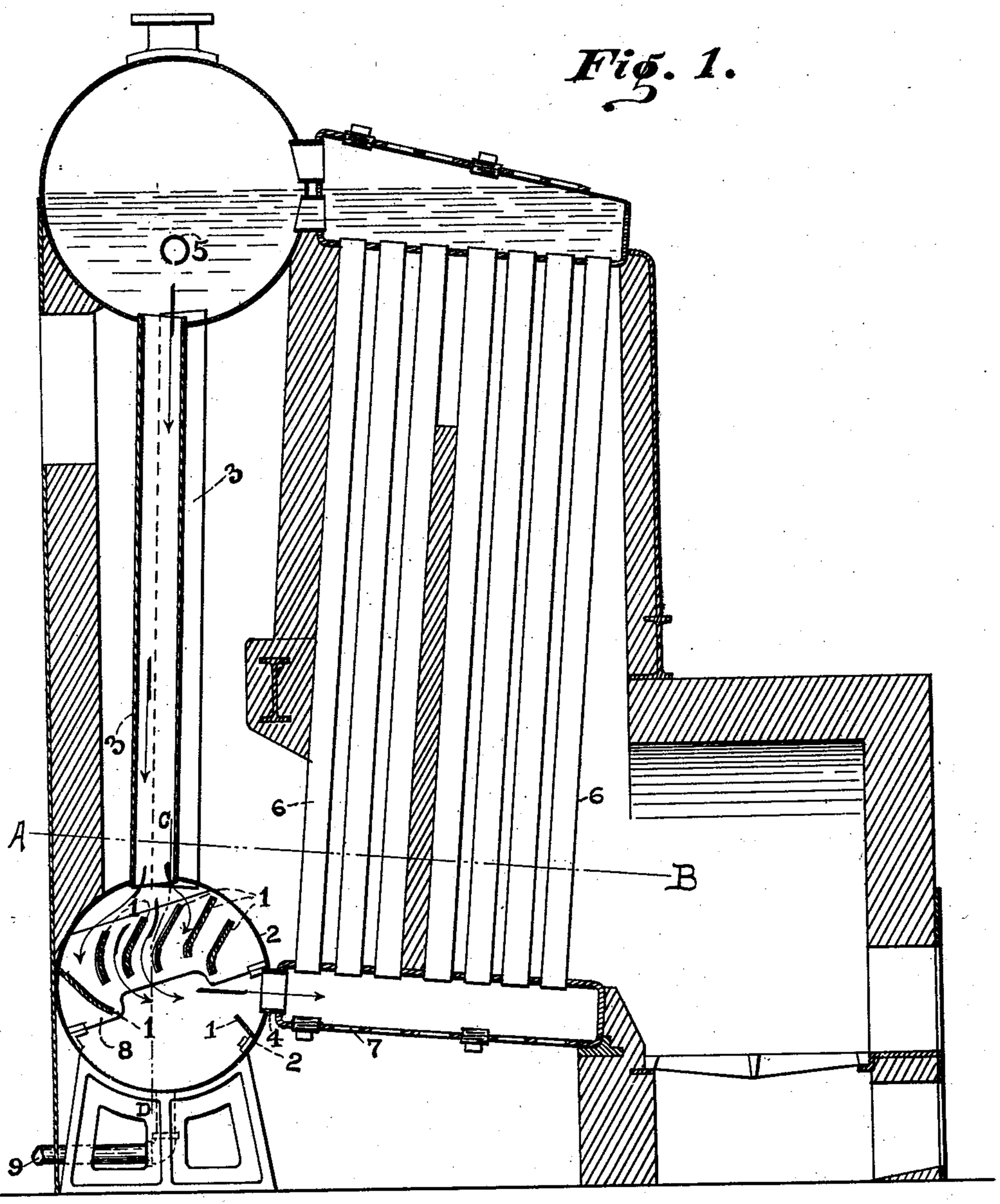
C. B. REARICK.

STEAM BOILER.

APPLICATION FILED AUG. 5, 1899.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

James T. Fullen.

D. H. Mustard.

INVENTOR

Chas B. Rearick

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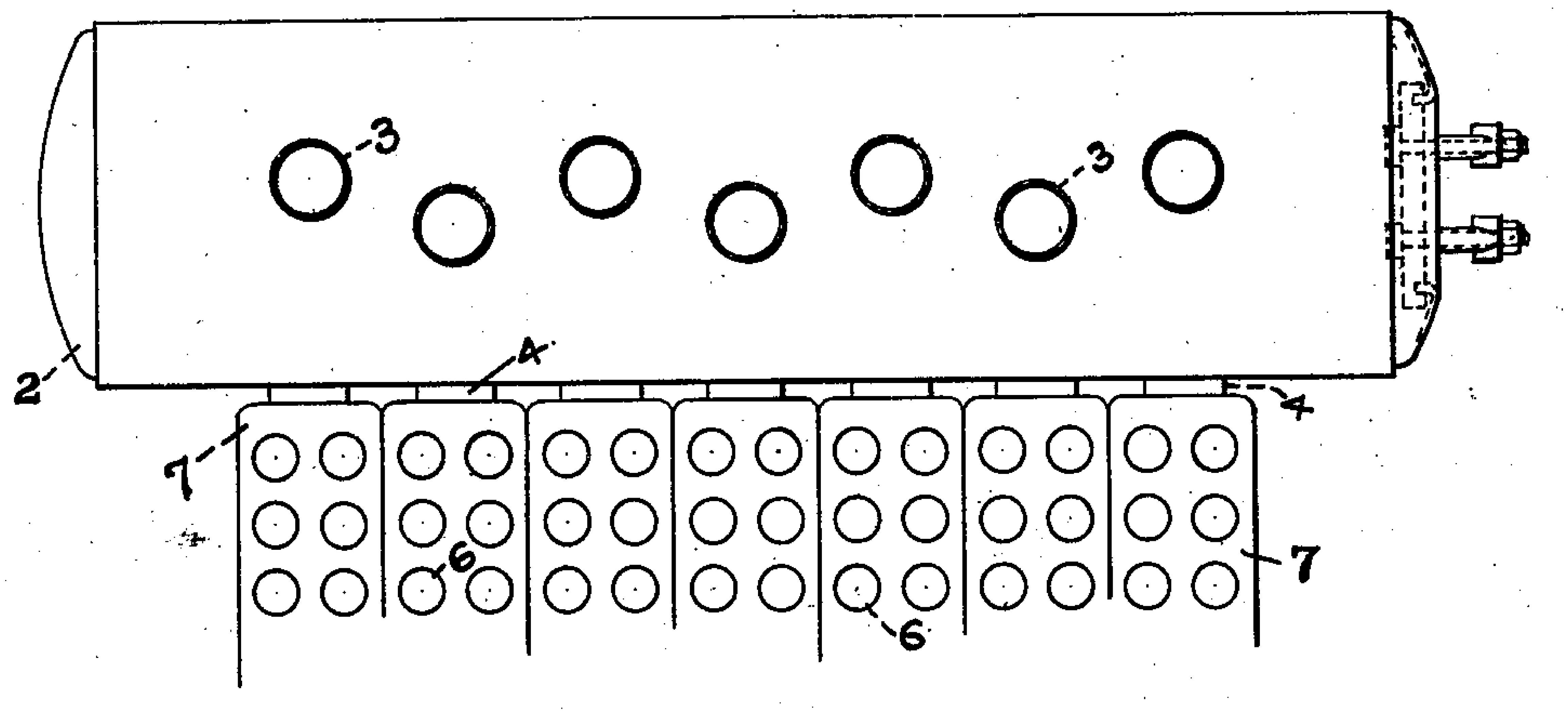

Fig. 2.

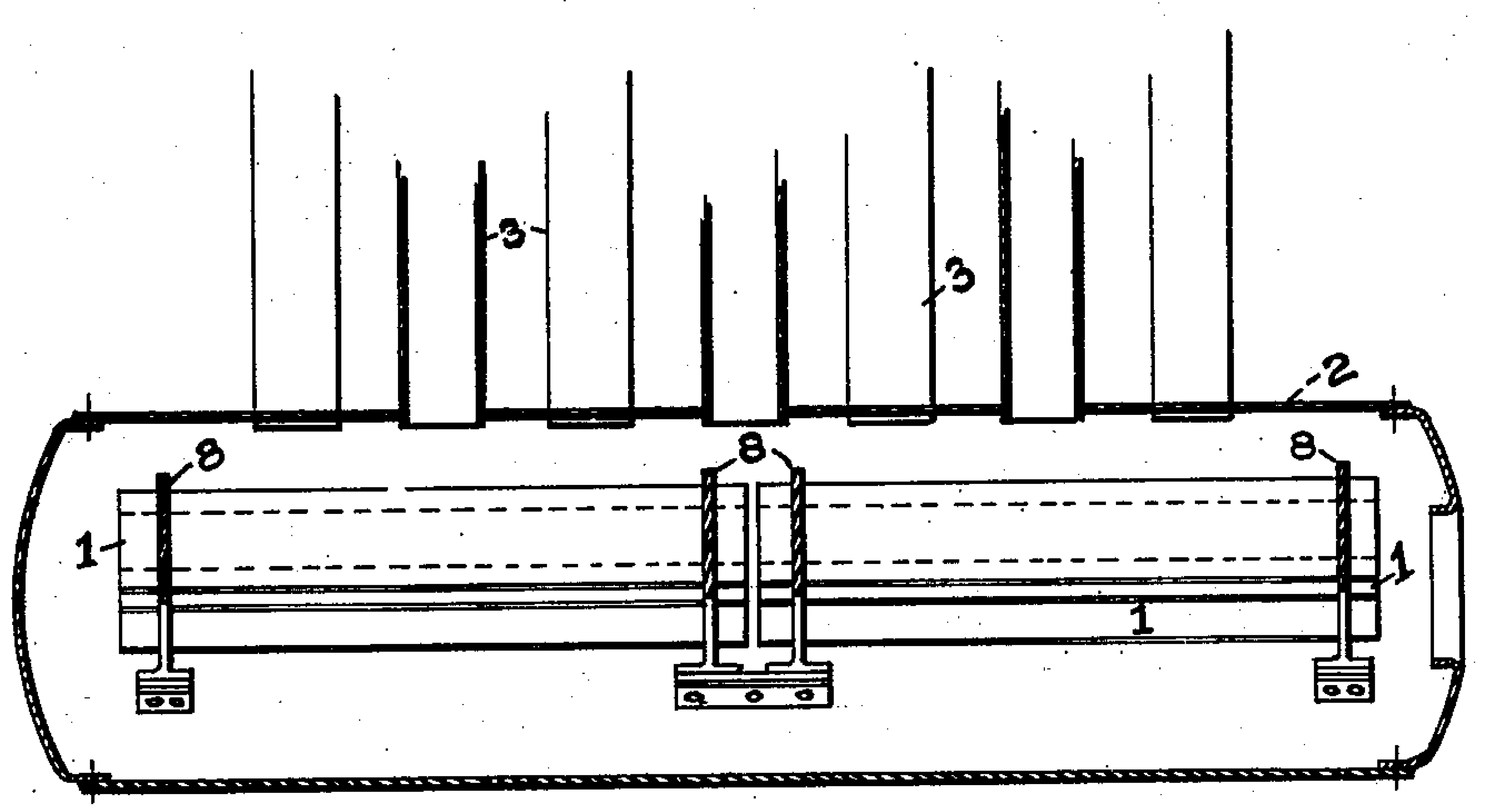

Fig. 3.

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No. 754,697. Patented March 15, 1904.

UNITED STATES PATENT OFFICE.

CHARLES B. REARICK, OF ST. LOUIS, MISSOURI.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 754,697, dated March 15, 1904.

Application filed August 5, 1899. Serial No. 726,346. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. REARICK, a citizen of the United States, residing in St. Louis, State of Missouri, have invented a new and useful Improvement in Steam-Boilers, of which the following is a specification.

My invention relates to improvements in steam-boilers for keeping them clean by separating and collecting within the boiler the solid impurities from the water therein and in this manner preventing the formation of what is commonly known as "scale." I thus attain, first, increased fuel economy; second, prevent burning of that part of the boiler exposed to the fire, and, third, prevent unequal expansion and consequent leakage of joints.

The invention consists of submerged collecting-plates placed in the boiler and in the circulating system of such boiler and the introducing of the feed-water into the circulating water, preferably before it reaches such plates, thus heating such newly-introduced water to a degree of temperature sufficient to precipitate the solid impurities for the free collection of same on the plates and the deposit of the heavier solid impurities in the bottom of the chamber in which the plates are placed, thus freeing the water of its impurities and preventing the boiler from becoming foul with scale.

In the accompanying drawings, Figure 1 represents a vertical sectional view of a water-tube boiler of similar design to that described in my Reissue Patent No. 11,974, issued March 4, 1902, containing collecting-plates 1, placed in a water and mud drum 2, downflow-pipes 3 to and outlet-passages 4 from water and mud drum. Feed-water enters at 5 and direction of water circulation being shown by flight of arrows. Fig. 2 represents cross-sectional view on line A B through downflow-pipes 3 and water-tubes 6 and also shows plan of water and mud drum 2 and bottom headers 7. Fig. 3 is a vertical section through water and mud drum 2 on line C D, showing the interior arrangement of collecting-plates 1 and their supports 8, also downflow-pipes 3 entering drum.

My invention can be used in any type of steam-boiler wherein there is a chamber or chambers through which or in which the water circulates constantly in one direction by placing collecting-plates in such chamber or chambers and by introducing the feed-water into circulating water, preferably before it reaches the collecting-plates. By such an arrangement the feed-water is heated to a high degree of temperature before reaching the collecting-plates, causing the solid matter to be precipitated, the lighter particles collecting on the plates, the heavier being deposited in the bottom of the chamber or chambers in which the plates are placed.

The collecting-plates 1 I prefer to place in a water and mud drum 2 with its axis horizontal and having inlet pipes or tubes 3 carrying downwardly-circulating water from an upper drum or vessel 10, in which feed-water enters from pipe 5, said inlet pipes or tubes 3 entering at or near the top of shell of drum 2 and outlet pipes or connections 4 from some other part of the shell through which the circulating water passes on its way to the principal heating-surface 6. The collecting-plates 1 are plain, and their surfaces may be either flat or curved and are arranged so as to distribute the water and bring as much of it as possible in contact with the plates 1 on its way from inlet-pipes 3 to outlet pipes or connections 4. These collecting-plates are removable for cleaning through openings provided for that purpose, in construction shown preferably at end of drum, and blow-off 9 is placed in bottom of chamber for removing the matter therein deposited.

While I show my invention as used in connection with but one type and design of boiler, I desire it to be understood that it can be used equally as well in other forms of boilers than that shown, and, furthermore, that changes in and variations from the specific constructions shown and described would readily suggest themselves to persons skilled in the art and still fall within the spirit and scope of my invention, and I do not, therefore, desire to confine myself to the exact construction and arrangements as shown and described; but,

Having set forth the objects and nature of my invention and a form of apparatus embodying the principles thereof, what I claim

as new and useful, and desire to secure by Letters Patent, is—

1. In a water-cleaner for steam-generators, the combination of suitable plates for collecting, in the manner described, the solid impurities in the circulating water of a steam-boiler, such plates being placed in the boiler below the water-line therein, with a feed-water inlet entering the circulating water before it reaches such plates.

2. In a water-cleaner for steam-generators, the combination of suitable plates for collecting, in the manner described, the solid impurities in the circulating water of a steam-boiler, such plates being placed below the water-line and in a chamber of the boiler through which the circulating water and newly-introduced feed-water is compelled to pass before coming in contact with the main portion of the heating-surface of the boiler.

3. In a water-cleaner for steam-generators, the combination of suitable plates for collecting, in the manner described, the solid impurities in the circulating water of a steam-boiler, such plates being placed in the boiler below the water-line and in the circulating current of water therein with the feed-water entering the circulating water before it reaches such plates.

4. In a water-cleaner for steam-generators, the combination of suitable removable plates for collecting, in the manner described, the solid impurities in the circulating water of a steam-boiler, such removable plates being placed within the boiler and below the water-line therein and at a point where there is a movement of the water.

CHAS. B. REARICK.

Witnesses:
A. H. MUSTARD,
JAMES T. FULLER.