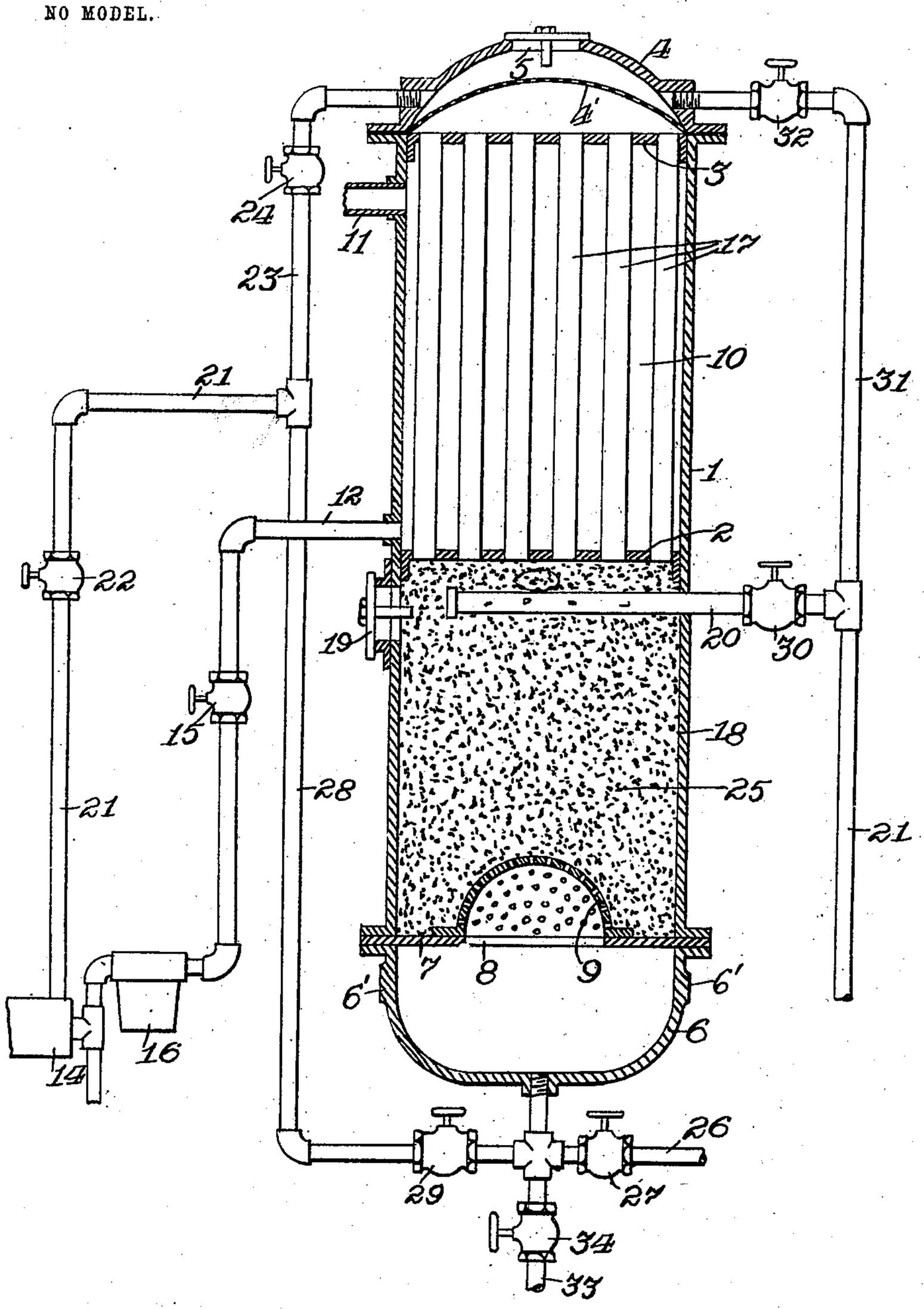
No. 754,014. PATENTED MAR. 8, 1904.

R. M. ROSS.

HEATER AND PURIFIER.

APPLICATION FILED AUG. 5, 1903.

NO MODEL.



Witnesses:
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No. 754,014. Patented March 8, 1904.

UNITED STATES PATENT OFFICE.

ROBERT M. ROSS, OF ALLEGHENY, PENNSYLVANIA.

HEATER AND PURIFIER.

SPECIFICATION forming part of Letters Patent No. 754,014, dated March 8, 1904.

Application filed August 5, 1903. Serial No. 168,318. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. ROSS, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Combination Heaters and Purifiers, of which improvement the following is a specification.

This invention relates to certain new and useful improvements in combination heaters and purifiers, and relates more particularly to that class of heaters and purifiers which are used for heating and purifying water for boiler feed.

The object of this invention is to provide an apparatus wherein water will be effectually heated and filtered and wherein the apparatus will be cheap and simple in construction.

A further object of this invention is to provide an apparatus which may be readily cleansed and wherein the filtering material may be easily renewed.

A still further object of this invention is to utilize the condensation of the steam used for heating the feed-water in such a manner that the loss of heat units will be reduced to a minimum.

With the above and other objects in view the invention consists in the novel construction, combination, and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claim.

In describing the invention in detail reference will be had to the accompanying drawing, which illustrates a sectional elevation of the apparatus, showing the connecting piping therefor.

Referring to the accompanying drawing, the reference-numeral 1 indicates a main outer shell, which is divided intermediate its length by the perforated drum 2, and a perforated drum 3 is provided at its upper end, as will be seen by referring to the drawing. A dome-cap 4 is secured to the shell 1 at its upper end by a flange connection, the strainer 4′ being secured between said flanges, and a manhole 5 is provided in said cap. The lower end of the shell is closed by the cap-piece 6, which is also secured to the said shell by a flange connection, a retaining-plate 7 being secured between said flange connection. An aperture 8 is provided in said retaining-plate, and a perforated hemispherical strainer is secured to said plate over said aperture.

The heating-chamber 10, which is formed between the drums 2 and 3, has a steam-inlet 11 connected therewith, and an outlet-pipe 12 is connected to the lower end of said chamber and connects with the suction-pipe of a feed-pump through the valve 15 and steam-trap 16. Pipes 17, seated in the apertures in the drums 2 and 3, form a communication between the dome 4 and filtering-chamber 18, whereby the water passing through the same will be heated by the steam in the heating-chamber 10.

The filtering-chamber 18 has a manhole 19 formed therein for the purpose of placing filtering material—such as ground granite, flint, or the like—therein, and a cleansing-pipe 20 leads into said chamber from the cleansing-pipe 21.

The water-supply to the apparatus is from the pump 14 through pipe 21, having the valve 22 interposed therein through the pipe 23, having the valve 24 interposed therein, to the dome 4, from whence the water will pass through the pipes 17, which are located in the heating-chamber, through the filtering material 25, strainer 9, dome 6, to the pipe 26, which has the valve 27 interposed therein. While I have shown the pipe connected to the bottom of the dome, lugs 6′ are cast on the sides of said dome to permit tapping the sides instead of the bottom of said dome, if desired. A pipe 28, having the valve 29 interposed therein, leads from the pipe 21 to the dome 6, and the pipe 21, which is a waste-pipe, has the branch 20, which is controlled by the valve 30, leading to the filtering-chamber, and the branch 31, controlled by the valve 32, leading to the dome 4. The dome 6 also has connected with it the waste-pipe 33, which is so controlled by the valve 34.

The filter having been set up and piped substantially as shown, the valves 22 24 15 27 in pipes 21 23 12 26, respectively, are open and the valves 29 34 30 32 in pipes 28 33 20 31, respectively, are closed, whereby the water will pass from the pump through pipes 21 23 through the heater and filter and pipe 26 to

the boiler. The condensation of steam within the heating-chamber will pass through pipe 12, trap 16, back to the pump 14.

When it is desired to cleanse the apparatus, the valves 22 29 30 32 are opened and the valves 24 15 27 34 are closed, whereby the water will pass in a reverse direction and out through the waste-pipe 21. The opening of the valve 34 will permit the drawing off of any water or sediment which may be in the dome 6.

While I have described my invention in detail, it will be obvious that various slight changes may be made in the piping and details of construction without departing from the general spirit of my invention.

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

In a device of the character described, the combination of an outer shell, caps for closing the ends of said shell, a heating-chamber formed within said shell, pipes leading through said chamber, a filtering-chamber located within said shell adjacent to the heating-chamber, filtering material within said filtering-chamber, a steam-inlet pipe connecting with the heating-chamber, a pipe for conducting the condensation from said chamber to a steam-trap, a pump for forcing water through the apparatus, connections between the steam-trap and pump whereby the condensation from the heating-chamber may be forced through the apparatus, waste connections whereby the apparatus may be cleansed, and valves for controlling the several connections, substantially as and for the purpose described.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ROBERT M. ROSS.

In presence of—
FRED. O. HENZI,
M. HUNTER.