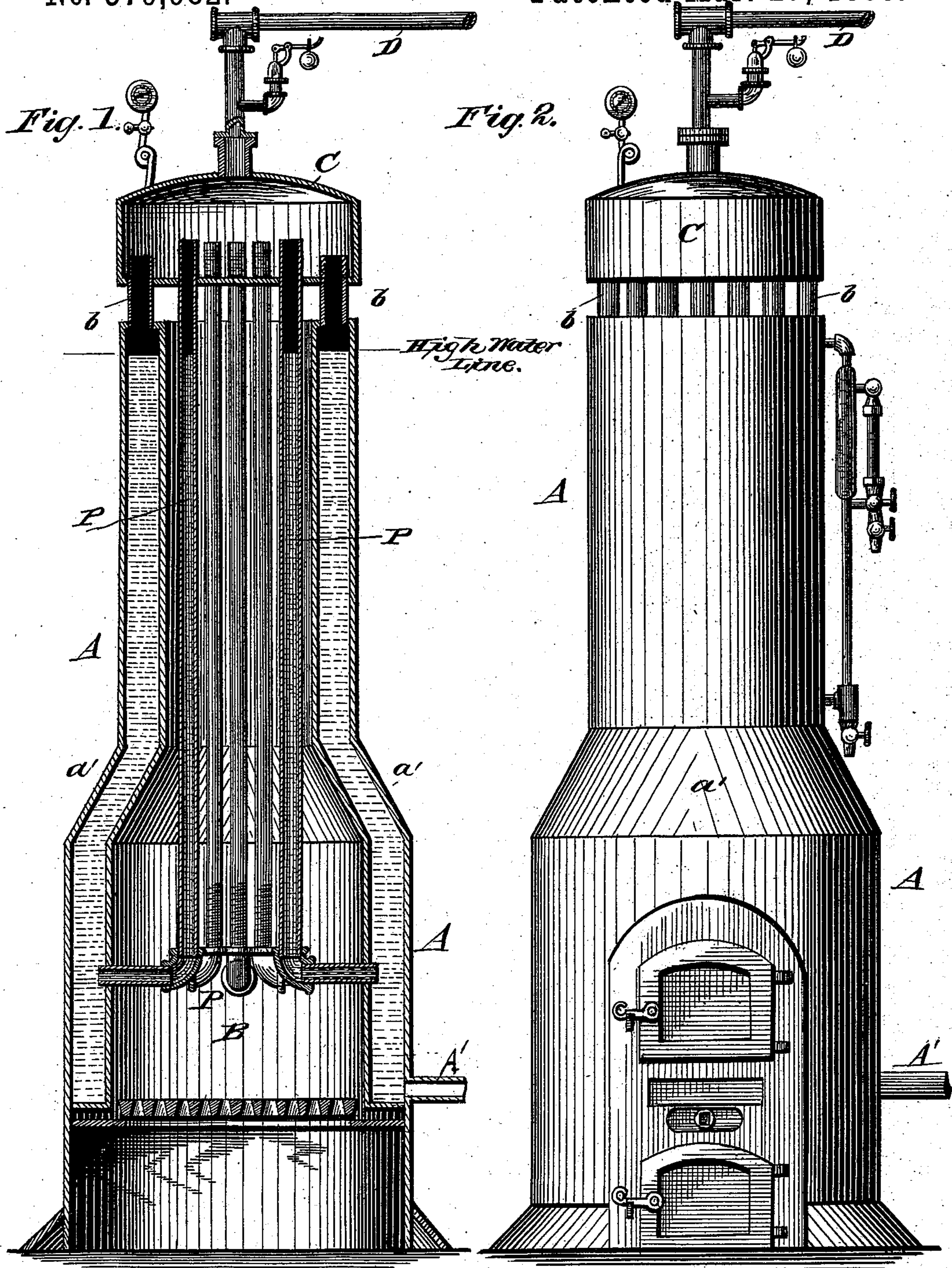


(No Model.)

W. C. RICE.
STEAM BOILER.

No. 379,982.

Patented Mar. 27, 1888.



WITNESSES.

Simon H. Loff.
Thomas L. Hickman.

INVENTOR

Walter C. Rice.
Smith & Sheehy
Attorneys

UNITED STATES PATENT OFFICE.

WALTER CHANNING RICE, OF PROVIDENCE, RHODE ISLAND.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 379,982, dated March 27, 1888.

Application filed June 30, 1887. Serial No. 243,007. (No model.)

To all whom it may concern:

Be it known that I, WALTER CHANNING RICE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Steam-Boilers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to steam-generators, and my object is to substitute for the bonnet in an upright boiler a steam-drum in which the steam cannot be superheated. I therefore employ common steam at all times, as will be made clear from the following description, taken in connection with the annexed drawings, in which—

Figure 1 is a diametrical section vertically through a steam-boiler, illustrating my improved device. Fig. 2 is a front elevation of the boiler incased, and showing the water and steam gages, also the pipe which leads to the engine.

Referring to the annexed drawings by letter, A designates a double-wall shell having the usual water-legs and the interior water-space. This constitutes the boiler proper, and may be supplied with water under pressure by a feed-pipe, A', located as shown in Figs. 1 and 2, or at any other suitable point of the shell. This shell is enlarged at the lower part, and is provided interiorly with a grate and a combustion-chamber, B. The upper part of the said double-wall shell is contracted at a' by a conical frustum, above which is a cylinder. At the upper terminus of this cylinder short pipes b are provided, which communicate with a steam-drum, C, from which common or "live steam," can be conducted to the engine by a pipe, D.

The shell A, which I have above described, has applied to it numerous pipes to afford a circulation of steam and water. These pipes, which I now letter P, are at their lower ends connected with the enlarged portion of the said double-wall shell A by suitable couplings, the threads thereof being unusually long. The upper ends of the pipes extend above the bottom of the steam-drum C, for the purpose of

allowing at all times a quantity of water in this drum sufficient to prevent the steam from being overheated or, technically termed, "superheated." It is obvious that as soon as steam begins to form in the boiler proper water of condensation will form in the drum C.

It will thus be seen that I have invented an upright boiler in which steam cannot be raised to a superheated state by reason of keeping at all times a quantity of water in the steam-drum.

The usual gages for indicating high and low water and pressure are used, as illustrated in my drawings.

It will be observed, first, that I have a steam-drum arranged above the boiler with a space between it and the boiler; second, that I have a concentric series of short steam-pipes, b, which establish steam-communications between the steam-space above high-water line in the boiler and the steam-space above the water-line in the drum; third, that I have a concentric series of water circulating and heating pipes arranged inside of the inner boiler-wall and extending into the steam-drum above the highest points of the steam-pipes b, and, fourth, that the pipes P terminate at their lower ends in horizontal radial branches arranged inside of the fire-box proper and directly over the grate, whereby a very large amount of heating-surface is obtained.

Having described my invention, I claim—

A steam-boiler consisting of a double-wall upright shell enlarged at its lower part to form a fire-box, a concentric series of water-heating pipes leading into a steam-drum above the water-line therein, and having radial branches at their lower ends communicating with the water-jacket surrounding the fire-box and arranged inside of the heating-space, a drum, C, above the top of the boiler, leaving an intervening space, and a concentric series of short steam-pipes, b, extending from the top of the boiler above the steam-space therein, as specified.

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

WALTER CHANNING RICE.

Witnesses:

SIMON K. GOFF,

THOMAS I. HUDSON.