

(No Model.)

H. N. WASS.
STEAM GENERATOR.

No. 366,283.

Patented July 12, 1887.

Fig. 1.

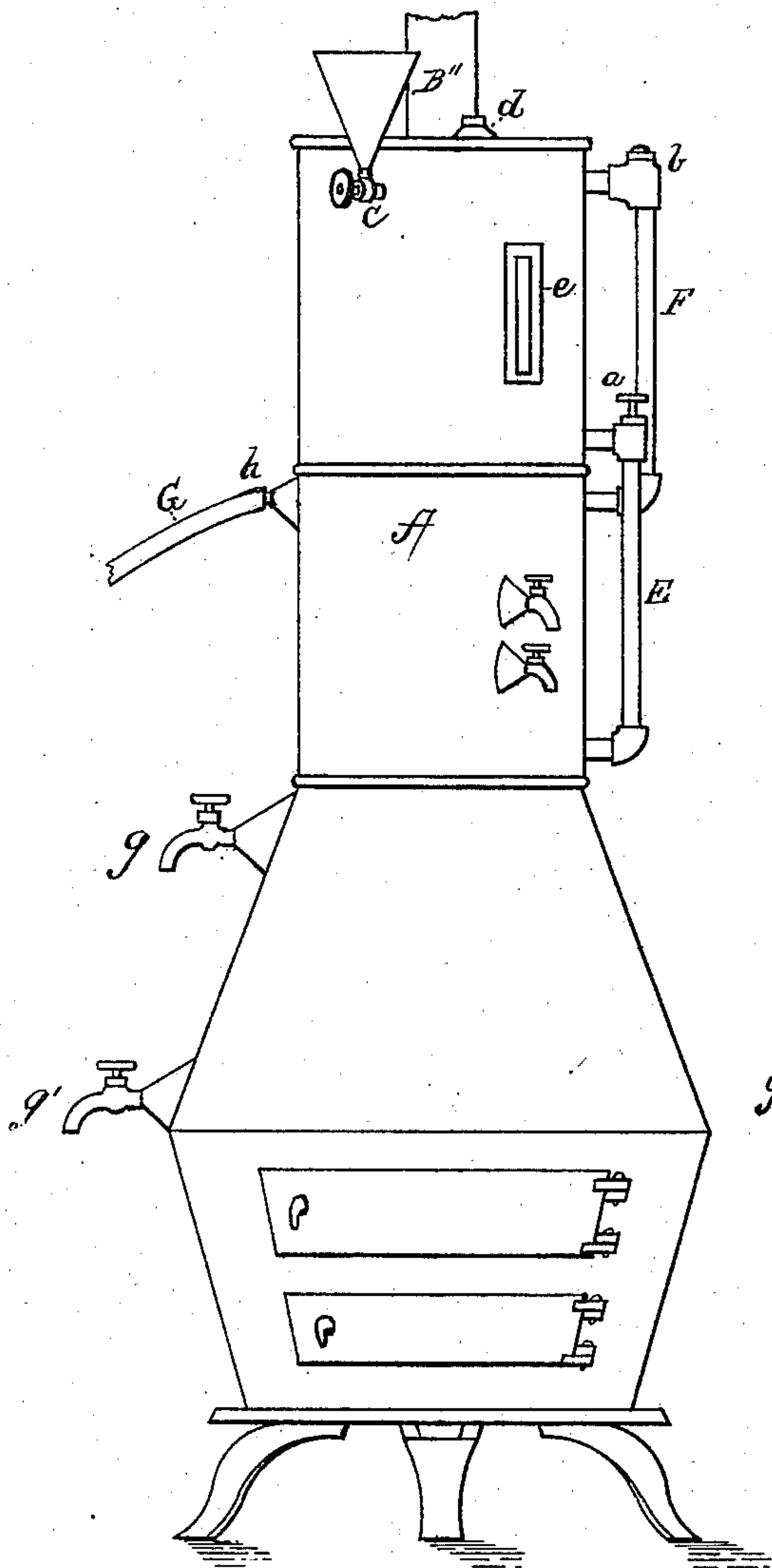
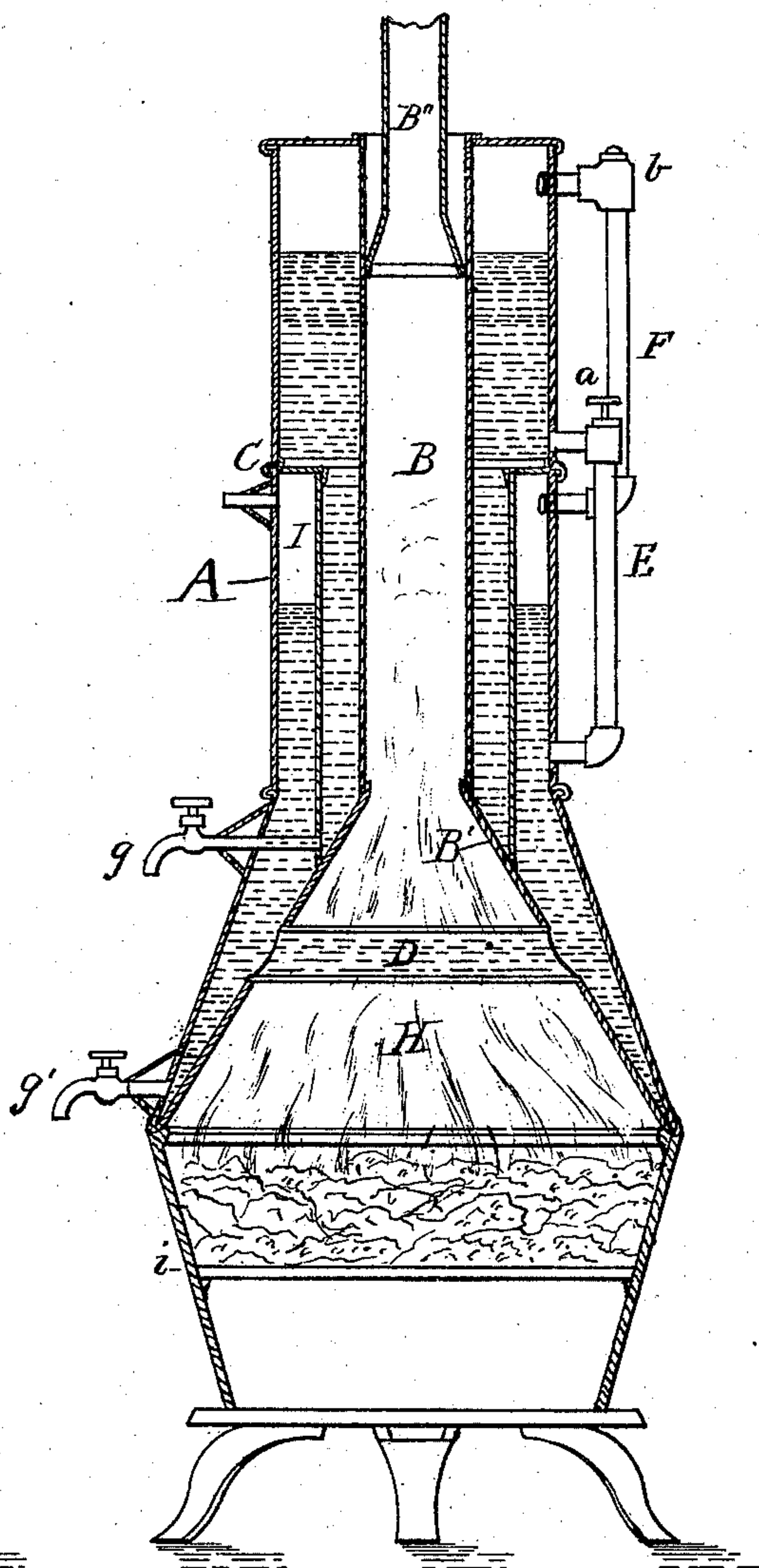


Fig. 2.



Attest.
S. M. Brainerd.
S. W. Norton.

Inventor.
Holmes St. Wass.
By J. M. St. John.
Atty.

UNITED STATES PATENT OFFICE.

HOLMES N. WASS, OF VINTON, IOWA.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 366,283, dated July 12, 1887.

Application filed April 25, 1887. Serial No. 236,126. (No model.)

To all whom it may concern:

Be it known that I, HOLMES N. WASS, a citizen of the United States, residing at Vinton, in the county of Benton and State of Iowa, have invented certain new and useful Improvements in Steam-Generators, of which the following is a specification.

This invention relates to steam-generators, and more particularly to such as are used for steaming feed and the like; and my object is to produce a steamer that shall be comparatively inexpensive and simple, and at the same time shall have a large and economical steam-generating capacity.

The invention consists in the peculiar construction and arrangement of the parts of the device, as will be hereinafter fully set forth and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of the invention, and Fig. 2 a vertical section of the same.

Similar letters of reference indicate corresponding parts.

The boiler consists of an outer shell, A, which is preferably flared at the lower end, so as to increase the heating-surface, at the same time increasing the relative capacity of the boiler. Within this shell is placed a central flue, B, which unites with the boiler at the head, and by a greater flare at the lower end joins the bottom of the boiler. About midway up the parallel portion of the boiler a diaphragm, C, connects the shell with an intermediate shell, which extends to an intersection with the flaring portion of the flue, as shown in Fig. 2. In practice I also run a connecting-pipe, D, across that part of the flue, and thus brace the sides of the crown-sheet and still further utilize the heat of the combustion-chamber. The two chambers into which the boiler is divided communicate by means of pipes E F. The pipe E is provided with a suitable valve, *a*, by the opening of which water in the upper compartment runs down into the lower one. The pipe F is for steam communication, and connects with the upper parts of the respective chambers. It is provided with a check-valve, *b*, which allows the steam in the upper chamber to escape into the lower one, but automatically prevents move-

ment in the opposite direction. Near the upper end of the boiler is placed a short feed-pipe, *c*, provided with a suitable cock and adapted to connect with a funnel, as shown, by means of which the boiler is charged. A simple hole in the top of the boiler provided with a suitable screw-plug, *d*, may answer the same purpose when there is no steam in the boiler. The upper chamber is provided with a glass, *e*, to determine the height of the water within, and the lower chamber with try-cocks for the same purpose. Connected with the bottom of the respective chambers are cocks *g g'*, by which the water may be let off from one or both. Near the top of the lower chamber any desired number of nozzles, *h*, project from the boiler, and are adapted to connect with hose or pipe G and transfer the steam to a distance for the heating of water or the like, as indicated.

For the uses to which the steamer is ordinarily applied it may be made of heavy galvanized iron and joined by solder. Being comparatively simple in structure, it is easily and cheaply manufactured. The furnace H, which forms the base for the steamer, consists in a circular fire-pot, preferably larger at the top than at the bottom, and divided into two chambers by the grate *i*. The bottom should extend outward below the doors to form a hearth, and the whole is elevated by suitable legs. The lower edge of the flared bottom of the boiler fits outside a bead raised on the upper edge of the fire-pot or furnace. It will be seen that the construction is such as to admit of the water being quite low in the lower chamber without danger of burning, since it must get below the intersection of the intermediate shell, I, with the crown-sheet B'. To protect from overheating that portion of the flue B which is normally above the water-line of the upper chamber, I insert in that portion of the flue a smaller pipe, B'', flaring it at the bottom, as shown, thus leaving an air-space between the steam in the chamber and the heat inside the flue.

The operation of the invention will now be readily understood. The valve *a* being open, water fed into the upper chamber flows into the lower one on reaching the level of the valve. The requisite amount is ascertained by the try-

cocks, and at the proper time the valve is closed and the upper chamber filled as full as may be desired. The large surface exposed to the heat of the furnace and the comparative
 5 thickness of the surrounding body of water insures a rapid generation of steam. As the water sinks in the lower chamber by the development and use of the steam, it is renewed by opening the cock *a*, the pressure in the re-
 10 spective chambers being so nearly equal as to admit of the water flowing down with little or no cessation of steam-generation in the lower chamber. When the water in the upper cham-
 15 ber becomes too low, it is renewed through the feed-pipe without greatly reducing the temperature of the water in the lower one. Should the pressure in the upper chamber at any time rise above that of the lower one, the equilib-
 20 rium is at once restored by the action of the check-valve *b*.

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

1. In combination with furnace H, the boiler
 25 composed of the outer shell A, the inner central flue, B, its lower portion flared to meet the lower edge of the outer shell and form a conical crown-sheet B', the intermediate shell, I, and the diaphragm C, all arranged substan-
 30 tially as and for the purpose set forth.

2. In combination with a furnace, substan-
 tially as described, the steam-boiler composed of an outer shell, a central flue flared at the lower end to meet the outer shell and form a
 35 conical crown-sheet, an intermediate shell connected with the crown-sheet at the bottom, an annular diaphragm connecting the upper end of the intermediate shell with the inside

of the outer shell, and a flue of smaller size in the upper portion of the central flue, forming
 40 an air-chamber between them, substantially as and for the purpose specified.

3. In combination with a furnace, substan-
 tially as described, the steam-boiler composed of the outer shell, A, the internal flue, B, the
 45 diaphragm C, and the intermediate shell, I, and having the water-pipe E and the steam-pipe F, all constructed, arranged, and adapted to operate substantially as set forth.

4. The combination, in a steam-boiler, of the
 50 outer shell, A, the central flue, B, having the flaring portion B', uniting with the lower edge of the outer shell and forming a conical crown-sheet, the intermediate shell, I, connecting with
 55 the conical crown-sheet, the annular diaphragm C, connecting the upper end of the intermediate shell with the inside of the outer one, and the transverse water-tube D, all constructed substantially as and for the purpose
 60 set forth.

5. In a steam-boiler, the combination of the
 outer shell, A, having the flaring bottom, as specified, the central flue, B, having the flaring
 portion B', forming a conical crown-sheet, the
 65 intermediate shell, I, connecting at the lower end with the crown-sheet and at the upper end with the annular diaphragm C, the said diaphragm connecting with the inner sides of the outer shell, the steam-outlets *h*, and the
 70 water-outlets *g g'*, substantially as described.

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

HOLMES N. WASS.

Witnesses:

WELLMAN BRAINERD,
 FRANK G. CLARK.